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WELCOME NOTE



Esteemed participants, I take this opportunity to welcome you to the 12th CUHAS Scientific Graduation Conference. The theme of this year conference is “**Addressing health threat in low and middle-income countries through effective research collaborations**” which gives us an opportunity to learn and dialog among growing concerns of health threats which do not spare low and middle income countries. It is high time that we conduct this event once again after the COVID 19 pandemic which prevented us to meet last year and highlight the remarkable contribution of effective research collaboration. A glance through the abstract book and list of presentations enlightened in the time-table reveals the amazing diversity of the health knowledge advance which will be in offer for the next two days.

This Scientific Conference will allow expert delegates from different universities and organizations within and outside the country to share their thoughts, knowledge and opinions to enhance our mental horizon. We expect to welcome 400 participants and over 100 scientific research abstracts to be scrutinized. The conference theme is subdivided to 6 sub-themes to maximize the coverage of all different angles of human health research, including non- communicable diseases and surgical conditions, infectious diseases and antimicrobial resistance, health services delivery and patients care, medical education and training, health system delivery and public health as well as maternal and child health. Research collaboration with local and international organizations/institutions will highlight the possibilities to address different aspects of health in low- and middle-income countries. The research findings to be presented in the next two days will lay the foundation for future in depth research to obtain some answers to emerging health problems. We call for concerted efforts from the regional and international scientific community to join hands for the betterment of the health of the people served and concerned by these works.

It is my hope that this scientific conference will help to identify our common challenges and discuss robust pragmatic solutions. On behalf of BMC and CUHAS, I would like to thank the organizing committee for their tireless efforts to make this conference a success. I wish you all a successful, safe and fruitful conference, and look forward to working with you to beat emerging health threats in low- and middle- income countries.

Yours sincerely,

Dr. Fabian Massaga
Director General Bugando Medical Centre

FOREWORD



I am delighted to write these foreword for 12th Scientific Graduation Conference, 2021. This conference has been jointly organized by CUHAS and BMC, with the support of our partners and collaborators Cornell and Wurzburg Universities. The main theme on this two days conference is “**Addressing health threat in low and middle-income countries through effective research collaborations**”. The scientific findings to be presented in these two days of symposium will stimulate and give insightful debate on the most critical issue of human health. Our keynote speakers of the opening sessions shall set a tone for the quality debate in each section. The participants will enjoy the scientific presentations both in form of oral presentations and display of the scientific posters, all resulting from a variety of research activities conducted by undergraduate students, residents, faculty and other research collaborators.

This abstract book contains more than 100 abstracts distributed in six main areas of focus based on the health challenges in low and middle income countries. I am anticipated that this conference will give the scientific community an opportunity to map a concerted effort to combat these data proven health challenges in low and middle income countries. In this abstract book we have number of policy brief which advocate the superlative solutions in combating different health challenges basing on the local and international data. It is my hope that these briefs will serve to remind researchers to always ensure that their work not only serves to produce data, but also provide solutions that address various health challenges that are relevant to the community. I am also delighted to inform readers that while presentations will be geared towards the dissemination of various research findings during this conference, there will be prizes for the best presenters on both days, to reward those who have excelled. I thank our researchers, collaborators, sponsors, the Organizing Committee and all those who participated to facilitate this event in one way or another.

I also thank all participants for availing yourselves to attend and actively engage in this Scientific Conference. I am assertive that the two days you will spend with us will surely be a worthwhile investment. On a social note, I encourage our out of town visitors to socialize responsibly while in Mwanza and to nevertheless fully enjoy the beauty of Rock City.

Prof. Paschalis Rugarabamu

Vice Chancellor, Catholic University of Health and Allied Sciences

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SUB-THEME: NON-COMMUNICABLE DISEASES AND SURGICAL CONDITIONS (NC)



NC01: Red Blood Cell Parameters and Associated Factors among Infants attending Sangabuye and Makongoro Health Centres, Mwanza, Tanzania

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Background: Red **blood** cell parameters are useful anaemic and inflammatory markers in diagnosis and monitoring of diseases. Result interpretation for these parameters is population and ethnic specific. However, among infants, establishment of normal values is difficult due to recruitment difficulties, together with the dynamic growth and development patterns. This study aimed to assess RBC parameters and associated factors among infants attending Sangabuye and Makongoro Health Centres in Mwanza Tanzania.

Methods: A cross sectional hospital-based study involving 200 infants attending post-natal clinics was conducted. Using a structured questionnaire, demographic and other study related data was collected. Blood samples were collected and tested in the auto analyzer (Dymind

DH-76). Data was analysed using STATA version 13.

Results: Majority of study participants were female 164 (54.7%) with a mean (SD) age of 6 (± 3) months. The mean Hb, MCV, and Erythrocyte count was 10.3 (± 1.25) g/dl, 73.1 (± 9.3) mm³ and 4.47 (± 0.87) $\times 10^6/\text{mm}^3$ respectively. By two sample t-test, only infants' current breast-feeding status had an effect on erythrocyte count ($p=0.0009$). On univariate analysis age ($p=0.001$) and body temperature ($p=0.001$) had effects on erythrocyte count while body temperature alone had effect on both erythrocyte count (0.009) and haemoglobin ($p=0.026$)

Conclusion: This study reports lower RBC values compared to parameter specific reference intervals routinely used in our setting. We recommend similar studies of different designs in the same population to further validate these findings

Keywords: *Reference intervals; RBC parameters*

NC02: Metabolic Status of Blood Donors attending Donation Sites in Mwanza Tanzania

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Background: Blood donors are presumed health individuals and the routine habit for health check-up is not a guarantee in this populations. Dyslipidaemia is among the metabolic indicators and a risk factor for cardiovascular diseases. This study aimed at assessing the prevalence of dyslipidaemia among blood donors attending donation sites in Mwanza Tanzania.

Methods: A cross sectional study involving 200 blood was conducted. A structured questionnaire was used to obtain socio demographic, clinical and other relevant information. Serum was tested for HDL, LDL and triglycerides. Data was analysed using STATA version 13.0 software.

Keywords: *Dyslipidaemia; Metabolic Status*

Results: The Median (IQR) age of 18 (18-21) years. Majority, 144 (72%) were male. An equal number 194 (97%) were non-alcohol users and non-smokers. The mean (SD) BMI was 23.50 (4.2) kg/m², and the prevalence of dyslipidaemia was 43 (21.5%). Increasing age (p=0.001 vs p=0.002), male gender (p=0.001 vs p=0.01), frequent exercises (p=0.02 vs p=0.02) and increase BMI (p=0.017 vs p=0.023) were significantly associated with abnormal HDL and triglycerides respectively.

Conclusion: The prevalence of dyslipidaemia among blood donors is high. Frequent check-up is advised for this population

NC03: Prevalence of Uncontrolled Type Two Diabetes and Associated Lipid Profile among Adult Patients at Bugando Medical Centre, Mwanza

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Background: Type 2 Diabetes is a global cause of morbidity and mortality especially among adults. Maintaining glycaemic control among T2DM patients is important to reduce long term complications. Dyslipidaemia is reported to be associated with uncontrolled T2DM and increase the risk of cardiovascular diseases, however, at Bugando Medical Centre lipid profile are not routinely checked among T2DM. This study aimed to determine prevalence of uncontrolled T2DM and associated lipid profile among T2DM adult patients at BMC.

Methods: A retrospective study was conducted at BMC Diabetic clinic. All T2DM patients with available records on required variables were enrolled. A pre-

tested questionnaire was used to obtain patients' data. Data was analysed using STATA version 13.

Results: 150 T2DM patients' data was retrieved from male and female patients (50%) whose mean (SD) age was 60.9(9.320) years. The prevalence of uncontrolled T2DM was 56% (84/150). The median glycated haemoglobin, HDL cholesterol and LDL cholesterol was 7.2(6-9.1) %, 1.4(1.1-1.5) mmol/L and 2.8(2.2-3.8) mmol/L respectively. Female gender was significantly associated with LDL cholesterol (p-value= 0.006)

Conclusion: The prevalence of uncontrolled T2DM was high. Routine lipid profile is important in monitoring T2DM patients.

Keywords: *Uncontrolled T2DM; Dyslipidaemia*

NC04: Creatinine and Urea Values among Blood Donors in Mwanza Tanzania

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Background: Normal laboratory values are interpreted from established reference values which are also important during diagnosis and disease management. It is recommended to establish locally derived values which are population, age and ethnic specific. However few studies have focused in assessing renal function test values in this population. This study aimed at assessing creatinine and urea values and associated factors among blood donors at different donation sites in Mwanza Tanzania.

Methods: A cross section study involving 200 blood donors was conducted between June and July 2021. Demographic and other data was collected using a pretested questionnaire. Approximately 5mls of blood was collected from participants and processed to obtain serum which was used to test for Urea (BUN) and Creatinine values in the auto analyser (COBAS

INTEGRA 400+). Data was analysed using STATA version 13.

Results: The median age of participants was 19 (18-25) years. Majority were male 148 (74%) secondary schools' students 186 (93%) with the median BMI of 23 (21.02-26.71) kg/m². The median Creatinine and BUN was 73(62-83) µmol/L and 2.48(2.05-3.10) mmol/L respectively. Male had significantly higher creatinine values than females (76 (IQR: 66-85) µmol/L vs. 62.5(IQR: 53-73) µmol/L, p=0.00). Moreover, increase in age had a significant increase in both BUN (p=0.004) and creatinine (p=0.00).

Conclusion: Reported renal function test values for the studied population are within the normal range of routinely used reference intervals. More population specific studies on other laboratory tests are encouraged in the same setting.

Keywords: *Reference range, reference interval, BUN, Creatinine*

NC05: Factors Affecting ESR and CRP Values among Adult Patients at Bugando Medical Centre, Mwanza, Tanzania

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Background: C-reactive protein and Erythrocyte sedimentation rate are important inflammatory markers routinely used in diagnosing and monitoring disease conditions. However, results are affected by different factors. We assessed the factors effecting CRP and ESR values among adult patients attending BMC

Methods: A total of 100 patients were involved. A pre-tested was used to collect demographic and clinical data. Blood samples were collected and tested for

CRP, ESR, HDL and Total protein. Data was analysed using STATA version 13.

Results: The median (IQR) age and BMI was 46 (34-63) years and 23.7 (21.3-26.7) kg/m². More than half 53(53%) were female, with 25 (25%) being hypertensive. Out of all factors, HDL (0.042) and BMI (0.030) had effects on ESR while CRP was affected by age (0.015).

Conclusion: These are baseline findings. Similar study with a large sample size should be conducted. Likewise, other factors should be considered when interpreting ESR and CRP results.

Keywords: *ESR; CRP; Inflammatory markers*

NC06: Clinical pattern and predictors of early outcome of paediatric surgical abdominal emergencies at Bugando Medical Centre, Mwanza, Tanzania

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Background: Paediatric surgical abdominal emergency is among the serious condition frequently encountered in the paediatric emergency department. Diagnosis of paediatric surgical abdominal emergencies was challenged by the nature of how information is acquired. Investigation is of paramount importance in reaching the correct diagnosis. The aim of this study was to determine the clinical patterns and predictors of early outcome paediatric surgical abdominal emergencies at Bugando Medical Centre.

Methods: This was a prospective descriptive study that involved 130 paediatric patients with abdominal surgical emergency who presented at Bugando Medical Centre from November 2020 to May 2021. All study participants were investigated prior surgery and after surgery, data were analysed using STATA version 13.

Results: During the study period, a total of 130 patients were enrolled into the study (Male: Female ratio=1.7:1), the median age of patients was 3years of age with most of patients presenting with abdominal distension (94.6%), abdominal pain (91.5%) and vomiting (76.2%). The leading cause of Paediatric surgical abdominal emergencies

was intestinal obstruction (66.0%) and peritonitis (21.8%). Postoperative complications were seen, electrolyte imbalance was the most common complication 25 (19.2%), surgical site infection 20 (15.4%). Duration of surgery (p-value=0.038), Surgical site infection (p-value=0.003), age (p-value=0.022), area of residence (p-value=0.042), were found to significantly increase the length of hospital stay. Furthermore, mortality occurred in 19 (19.6%), hyponatremia (p-value= 0.001), hypokalaemia (p-value=0.001) and low haemoglobin level (p-value=0.050) were found to significantly predict mortality.

Conclusion: Abdominal distension and abdominal pain are the most common clinical presenting symptoms in Paediatric surgical abdominal emergencies. Intestinal obstructions and peritonitis are most common cause of Paediatric surgical abdominal emergencies. Surgical site infection and duration of surgery increased the length of hospital stay; Electrolyte imbalance is the most common post-operative complication and is significantly associated with mortality which was found to be high at Bugando Medical Centre.

Keywords: *Clinical Pattern; Predictors of Early Outcome; Paediatric Surgical Abdominal Emergencies; Bugando Medical Centre; Tanzania*

NC07: ASAT and ALAT Values among Blood Donors attending Donation Sites in Mwanza Tanzania

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Background: Blood donors are presumed healthy individuals. Specifically, before blood donation disease screening is mainly focused on infectious diseases. There is scarcity of information on population specific values for several other laboratory tests despite the recommendation to establish locally derived normal values. This study aimed to assess ASAT and ALAT normal values and associated factors among blood donors in Mwanza Tanzania.

Methods: A cross section study involving 200 blood donors was conducted between June and July 2021. Demographic and other data was collected using a pretested questionnaire. Approximately 5mls of blood was collected and used to quantify ASAT and ALAT values in the auto analyser (COBAS INTEGRA 400+). Data was analysed using STATA version 13.

Results: The median age of participants was 19 (18-25) years. Majority were male 148 (74%) secondary schools' students 186

(93%) with the median BMI of 23 (21.02-26.71) kg/m². The median ASAT and ALAT values were 36.82 (25.49-51.78) IU/L and 7.58(11.05-16.31) IU/L respectively. The median lower ASAT and ALAT values were 28.42 (20.28-34.24) IU/L and 10.62 (7.55-15.79) IU/L while median higher ASAT and ALAT values were 54.13 (46.50-71.24) and 54.0(51.89-8.19) respectively. The median ASAT and ALAT values were significantly higher in male than female (37.93 (29.26-52.03) vs 31.14(21.33-45.80), p=0.024) and 12.25 (8.24-16.46) vs 8.62 (6.53-12.49), p=0.002) respectively. Moreover, increase in age (r=-0.8, p=0.035) and BMI (r= -1.2, p=0.04) were significantly associated with decreasing ASAT values

Conclusion: ASAT AND ALAT values were reportedly higher than routinely used reference values. This is a baseline for other local specific studies involving more factors, and a large sample size.

Keywords: ASAT; ALAT; Reference Values; Reference Intervals; Reference Range

NC08: Declining in Prevalence and Hepatosplenic Morbidities following Implementation of the Integrated Intervention Measures in Peri-Urban Fishing Communities of Mwanza City, Tanzania

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Background: The World Health Organization calls for integrated interventions measures for countries where schistosomiasis is endemic to reach the elimination phase. To respond to this call, from 2017-2019, integrated intervention measures were implemented in the peri-urban fishing communities of Mwanza city, which included public health information campaigns, community-based mass drug administration (MDA), child hygiene and sanitation training, testing and treatment campaigns, and improvement of diagnostic skills within the primary health care system. Here we report the impact of the intervention on schistosomiasis indicators.

Methods: For three consecutive years, annual community-based MDA were implemented in fishing communities along the Lake Victoria in Ilemela and Nyamagana. This was preceded by information campaign, training of community drug distributors, and tests and treat campaigns. Adult individuals were treated under the community-based approach.

Results: A total of 63,305 adults aged ≥15 years participated in 3 rounds of MDA within

the project, 27,699 (43.8%) and 35,606 (56.2%) were females and males, respectively. The number of participants increased from 18,252 in the 1st round to 22,581 and 22,583 in the 2nd and 3rd treatment rounds. Through test and treatment campaigns, a total of 1,744 (81.6%), 1,467, (70.8%) and 1,586 (74.1%) of the participants were diagnosed and treated for *S. mansoni* infection in that period. During the study period, the prevalence of *S. mansoni* declined from 39.5% (baseline survey) to 13.9% (end-line surveys). In addition, the prevalence of ultrasound-detectable *S. mansoni* related liver morbidities declined from 45.4% to 19.5% in males and from 30.7% to 14.6% in females. In the health facilities, the proportion of stools samples tested positive for *S. mansoni* out of all stool samples tested increased from 3.7% (year 1) to 19% (year 2) and 26.6% (year 3).

Conclusion: This study demonstrates the value of integrated intervention measures that can lead to a significant reduction in the prevalence of *S. mansoni* and associated morbidities, and thus have the potential to improve community health.

Keywords: *Schistosomiasis; Integrated Intervention; Prevalence; Hepatosplenic Morbidities; Adult; Tanzania*

NC09: Sexual Rehabilitation Strategies and Outcomes among Cervical Cancer Survivors Attending Clinic at Bugando Medical Centre, North-western Tanzania

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Background: Sexual dysfunction is the most common side effect encountered by cervical cancer patients during and after treatment, and rehabilitation strategies are needed to improve their quality of life. A variety of rehabilitation strategies have been reported in previous studies, varying by country, race and even continent. However, the common rehabilitation strategies used by cervical cancer survivors in Tanzania and their outcomes are unknown. The objective of this study was to unfold sexual rehabilitation strategies and outcome practiced by cervical cancer survivors who experienced sexual dysfunction during and after treatment in North-western Tanzania.

Methods: Descriptive qualitative study employing phenomenology study design used with a sample of 7 participants and data corrected via in-depth interview guided by 11 questions. Audiotaped and transcribed to get main themes and sub themes. Data collection was conducted

between September and October 2021 after the ethical clearance approval from the ethics committee and permission from the Director General of Bugando Medical Centre.

Results: Most participants reported inability to achieve an orgasm and low libido and dyspareunia after treatment. Most participants were eagerly to have their sexual activity recovered. However, they were not familiar with any rehabilitation strategy after the experience of sexual dysfunction. Even though, some of the participants attempted various interventions, but all were unsatisfactory leading to a significant decline in sexual interest and activity.

Conclusion: Cervical cancer survivors are not familiar with any sexual rehabilitation strategies. Health education concerning various sexual rehabilitation strategies should be provided to survivors during and even after treatment.

Keywords: *Cervical Cancer Survivors; Sexual Dysfunction; Sexual Rehabilitation Strategies*

NC10: Is the FINDRISC Tool Useful in Screening Pre-Diabetes/Type 2 Diabetes and Metabolic Syndrome in An African Setting? Experience among Young Adults in Urban Tanzania

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Background: The prevalence of type 2 diabetes mellitus (T2D) and metabolic syndrome is also on the rise in Tanzania. Simple and less costly screening tools are needed to combat the epidemic. The Finnish Diabetes Risk Score (FINDRISC) is widely used as a tool to predict future risk of T2D but its utility as a screening tool for current disease conditions is yet to be fully explored. This study aimed to evaluate the utility of FINDRISC as a screening tool for pre-diabetes, T2D and other metabolic syndrome-related derangements in a population of young adults in urban Mwanza-Tanzania.

Methods: A cross-sectional community-based study was conducted among participants aged 18-35 years in Mwanza, Tanzania. The Finnish diabetes questionnaire was used to collect data and compute FINDRISC scores for each participant. Socio-demographic, anthropometric, blood glucose and lipid profiles data were collected and recorded as per standard operating procedures.

Results: 259 participants were recruited into the study. The median age was 21

years (IQR 19-27), and more than half 60.2% (156) were females. 32.8% (85) of participants a slightly elevated risk of developing T2D in 10-years' time. Compared to Oral Glucose Tolerance Test (OGTT) as standard test for screening of pre-diabetes/diabetes, FINDRISC had sensitivity and specificity of 39.1% and 69.2% respectively, with a weak ability to discriminate those with and without pre-diabetes/T2D (aROC = 0.54). FINDRISC scores were significantly correlated with diastolic blood pressure ($r=0.19$, $r^2=0.03$ $P=0.02$), mean arterial blood pressure ($r=0.13$, $r^2=0.01$, $P=0.036$), low density lipoprotein cholesterol ($r=0.19$, $r^2=0.03$, $P=0.005$) and fasting blood glucose ($r=0.12$, $r^2=0.01$, $P=0.05$).

Conclusion: In this study, FINDRISC has shown low sensitivity and specificity against OGTT in screening of pre-diabetes/T2D in young adults. However, FINDRISC has shown its potential utility in screening of other metabolic syndrome-related derangements among young adults in Sub-Saharan Africa.

Keywords: *Diabetes mellitus; metabolic syndrome; FINDRISC; young adults; Sub-Saharan Africa*

NC11: Presumed Large Vessel Occlusion in Patients presenting with First-ever Ischemic Stroke at a Tertiary Teaching Hospital in Tanzania

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Background: Large vessel ischemic strokes account for more than one-third of all strokes associated with substantial morbidity and mortality without early intervention. The actual incidence of large vessel occlusion (LVO) is not known in sub-Saharan Africa. Definitive vessel imaging is not routinely available in resource limited settings. We aimed to investigate the burden and outcomes of LVO among ischemic stroke patients admitted at a large tertiary hospital in Tanzania.

Methods: This cohort study recruited all consenting first-ever ischemic stroke participants admitted at a large tertiary hospital in Tanzania. A diagnosis of presumed LVO was made by a neuro-radiologist based on contiguous ischemic changes in a pattern consistent with proximal LVO on non-contrast Computed Tomography head. We examined factors associated with presumed LVO using logistic regression analysis.

Results: We enrolled 158 first-ever ischemic strokes over 8-months with a mean age of

59.7±16.6 years. Presumed LVO accounted for 39.2% [95%CI 31.6%-47.3%] with an overall median time of stroke symptoms to hospital arrival of 1-day IQR [1-2]. Participants with presumed LVO were more likely to involve the middle cerebral artery territory (70.9%); $p < 0.0001$. Independent factors on multivariable analysis associated with presumed LVO were increased waist-hip ratio {adjusted OR 9.31 (95% CI: 2.47–34.99)}, hypertension {adjusted OR 6.74 (95% CI: 2.29–19.85)} and alcohol consumption {adjusted OR 3.97 (95% CI: 1.21–13.00)}. One-year mortality in presumed LVO was 50% compared with 37.5% in participants without presumed LVO.

Conclusion: There is a high burden of presumed LVO with high rates of mortality at one year. Further studies utilizing definitive vessel imaging will be key in establishing the actual incidence and for planning preventive and therapeutic strategies in sub-Saharan Africa.

Keywords: *Large Vessel Occlusion; Acute Ischemic stroke; Mortality; Tanzania*

NC12: Clinical Patterns of Genitourinary Fistula and its Associated Factors among Patients Treated at Bugando Medical Centre and CCBRT Hospitals in Tanzania

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Background: Genitourinary fistulas pose a public health challenge in areas where women have inadequate access to quality obstetric and gynaecological care and occur most commonly because of obstetrics and gynaecological injuries. Despite various improvements, the problem persists and about 1 to 3.5 million women suffer from genitourinary fistula worldwide. In Tanzania, it is estimated that there are approximately 2,500-3,000 new cases of fistula each year. There is a need to determine the clinical patterns of genitourinary fistula and the factors associated with its occurrence among patients treated at BMC and CCBRT hospitals in Tanzania.

Methods: A cross-sectional study was conducted from March 2021 to June 2021 at BMC and CCBRT hospitals in Tanzania including all patients treated in the gynaecological ward at BMC and fistula ward at CCBRT hospital. Non-probability purposive sampling technique was used; data were collected in a structured interviewer-administered questionnaire,

later analysed by STATA software version 15.

Results: During the study period, 332 patients were enrolled from BMC and CCBRT hospitals, the prevalence of genitourinary fistula at BMC was found to be 28.5% of the total gynaecological admission. Juxta cervical location of the fistula was common (37.9%), followed by ureteric injuries (17.9%), generally among patients who developed fistula post-operatively. Caesarean section accounted for most of the procedures, followed by hysterectomy. The occurrence of the genitourinary fistula was associated with labour duration for more than 24 hours AOR 3.2 [95% CI 1.7-6.0], p-value <0.00, illiteracy AOR 3.8 [95%CI 1.1-12.6], p-value 0.029 and living in rural areas AOR 3.7[95% CI 1.8-7.8], p-value <0.001.

Conclusion: The prevalence of genitourinary fistula at BMC was 28.5%. The majority of the patients developed fistula post-surgical interventions due to obstetrics or gynaecological complications.

Keywords: *Genitourinary Fistula; Bugando Medical Centre; Associated Factors*

NC13: The Burden, Correlates and Outcomes of Left Ventricular Hypertrophy among Young Africans with First Ever Stroke in Tanzania

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Background: Left ventricular hypertrophy (LVH) is a pathophysiological response often due to chronic uncontrolled hypertension. Our primary aim was to investigate the magnitude, correlates and outcomes of LVH as a surrogate maker for chronic uncontrolled hypertension in young adults (≤ 45 years) with stroke. Our secondary aim was to determine the accuracy of electrocardiography using Sokolow-Lyon and Cornell criteria in detecting LVH compared to echocardiography.

Methods: This cohort study recruited young strokes who had undergone brain imaging, electrocardiography and transthoracic echocardiography. The modified Poisson regression model examined correlates for LVH. The National Institute of Health Stroke Scale assessed stroke severity and the modified Rankin Scale assessed outcomes to 30-days. The performance of electrical voltage criteria was estimated using receiver operator characteristics.

Results: We enrolled 101 stroke participants. Brain imaging revealed ischemic strokes in 60 (59.4%) and those with intracerebral

haemorrhage, 33 (86.8%) were localized to the basal ganglia. LVH was present in 76 (75.3%), and 30 (39.5%) and 28 (36.8%) had moderate or severe hypertrophy respectively. Young adults with premorbid or new diagnosis of hypertension were more likely to have LVH, 47 (61.8%), and 26 (34.2%). On multivariable analysis, LVH was independently associated with not being on anti-hypertensive medications among hypertensive participants {risk ratio 1.4 (95%CI:1.04–1.94)}. The mean National Institute of Health Stroke score was 18 and 30-day mortality was 42 (43.3%). The sensitivity and specificity for Sokolow-Lyon in detecting LVH was 27% and 78%, and for Cornell was 32% and 52% respectively.

Conclusion: We identified a high proportion of LVH in young adults with stroke associated with chronic undertreated hypertension coupled with a high 30-day mortality. Our findings did not support the use of the electrical voltage criteria for detecting LVH. We recommend low-cost interventions like blood pressure screening and treatment to reduce this burden.

Keywords: *Left Ventricular Hypertrophy; Young Adults; Hypertension; Echocardiography; Electrocardiography*

NC14: Morphological Patterns of Traumatic Head Injury in Medico-legal Autopsies in Dar es Salaam Tanzania; a Descriptive Cross-Sectional Study

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Background: Head injury may surpass many diseases as a major cause of death and disability by the year 2020. There is limited documentation on the morphological patterns of traumatic head injury and its prevalence in medical legal autopsy in the Tanzanian population. The aim was to determine the morphological patterns of Traumatic Head Injury (TBI) in medical legal autopsies at Muhimbili National Hospital (MNH).

Methods: This was a hospital-based cross-sectional study conducted at MNH mortuary. Post-mortem examination was performed under Virchow method on 170 cases of TBI in which morphological patterns of TBI were recorded. Proportion of TBI and frequency of various morphological patterns in medical legal autopsies were obtained. Association between the cause of death on traumatic TBI among medical-legal autopsies and the

aetiology of the injury were measured by Fisher-exact test to assess statistically significance.

Results: The proportion of TBI among the medico-legal autopsy at MNH was (38.5%). All had scalp abrasion, and the majority had linear fracture 67(39.3%); the commonest bone affected was the parietal bone 85(55.6%). In closed TBI, the majority had subarachnoid haemorrhage 130 (84.9%). All had brain oedema while 1 had metastatic adenocarcinoma. About 42 had brain herniation, 51 brain laceration and 52 had brain contusion. The association between aetiology of injury, wearing helmets among motorcycle users and cause of death was statistically significance ($p < 0.05$).

Conclusion: The higher proportion of traumatic head injury among all medico-legal autopsies at MNH reflects the burden of head injury in our settings

Keywords: *Traumatic Head Injury; Medicolegal Autopsy; Morphological Patterns*

NC15: Exposure to welding fumes and noise levels: An emerging public health hazards from arc welding sites in Mwanza City, North-western Tanzania

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Background: In recent years, Tanzania has supported the development of large-and small-scale industries across the country. In response to the government's move for industrialization, there has been an increase in informal and formal small-scale industries such as welding sites. Different studies have cautioned on the potential exposure to multiple hazards associated with welding activities to the people involved and the surrounding communities. This study aimed to understand informal welders' exposure to noise and welding fumes in Mwanza City in northern Tanzania.

Methods: An analytical cross-sectional study was used to recruit 219 informal welders from 70 welding sites as well as 10 sites as baseline (controls). Modified Poisson regression was used to determine the association between exposures and location, knowledge, adherence to safety, welding section, safety training, self-reported health problems, and social-economic status among study informal welders.

Results: Majority (92.7%) of the informal welders were highly exposed to noise at the source and (60.7%) at two meters. The median level of noise at the source is 100.9 dB(A) and 86.7dB(A) at 2 meters. A high percentage (75.3%) experience high concentrations of welding fumes at PM_{2.5}; whereas 13.7% were exposed to welding fumes at PM₁₀. Informal welders who reported two or more nasal symptoms had 39% higher exposure of welding fumes at PM_{2.5} (aPR= 1.39, 95% CI=1.04-1.85) as compared to those without nasal symptoms.

Conclusion: The rates of noise, welding fumes exposure, and self-reported health problems were relatively significant in the studied population. This calls for a need to design targeted interventions to increase the knowledge on occupational safety practices and adherence to safety and health guidelines among informal welders which may reduce the risk of occupational health problems among the welders and the communities around.

Keywords: Occupational Safety Practices; Welding; Noise; Welding Fumes

NC16: Risk Factors for Physician Burnout: A perspective from Tanzania

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Background: While physician burnout has been studied in high-income countries, more research is necessary on burnout in lesser-income regions such as Tanzania. This study aimed to determine levels of burnout in Tanzanian physicians and to understand the contributing risk factors for burnout in this region.

Methods: The Maslach Burnout Inventory (MBI-HSS) was adapted to assess burnout in Tanzanian physicians. Utilizing a cross-sectional design, we studied two distinct cohorts: 1) Emergency Medicine (EM) trained physicians in Tanzania and 2) specialists at Bugando Medical Centre. We surveyed demographic, personal, and workplace data to identify risk factors for burnout.

Results: 77% (30/39) of Tanzanian EM providers and 39% (37/94) of Bugando specialists completed the survey. We identified burnout in 67% of Tanzanian EM providers and in 70% of specialists at

Bugando. Burnout risk factors in EM physicians included dissatisfaction with career choice, considering switching institutions, working in an urban setting, inadequate coverage for emergencies/leave, and financial housing responsibilities. In Bugando specialists, risk factors were unnecessary administrative paperwork, working overnight shifts, pressure to achieve patient satisfaction or decrease length of stay, meaningful mentorship, and not having a close friend/family member die.

Conclusion: This study reports a high prevalence of burnout in Tanzanian physicians. Risk factors for burnout were multifactorial but mainly related to institutional and workplace constituents. Targeting these risk factors provides opportunities to boost physician wellness and guides important areas for future research in this African region.

Keywords: *Burnout; Wellness; Tanzania; Global Health*

NC17: Clinical and histopathological diagnosis of Kaposi's sarcoma at Muhimbili National Hospital, Dar es salaam, Tanzania

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Background: The treatment outcome of Kaposi's sarcoma (KS) depends on a correct histopathological diagnosis, most KS cases in developing countries are diagnosed clinically without histopathological confirmation, leading to inaccurate diagnosis. Due to the number of histopathological mimickers in different stages of KS which include benign to fatal conditions, the histopathological diagnosis of KS is not always correct. HHV-8-LANA-1 Immunohistochemical (IHC) stain is positive in nearly all KS lesions and is an important diagnostic tool to differentiate KS from its histological mimickers. The objective of this study was to evaluate the diagnostic agreement between clinical, histopathological against HHV-8-LANA-1 Immunohistochemistry among KS cases at MNH

Methods: This was a cross-sectional hospital-based study, conducted at Muhimbili National Hospital. It included all KS cases diagnosed either by clinical, histopathological, or both in 2018 and confirmed by HHV8-LANA-1 immunohistochemistry gold standard.

Kappa was used to determine the agreement rate between clinical or histopathology diagnosis against the gold standard and the value above 0.00 with a p-value less than 0.005 was considered as a significant agreement.

Results: Clinical diagnosis concordance rate was 61% with no agreement (Kappa value -0.123, p-value=0.102). Clinical differential diagnosis included pathological conditions ranging from less severe inflammatory to fatal malignant conditions. There was a substantial agreement between initial histopathology and HHV-8-LANA-1 IHC for KS diagnosis (Kappa=0.70, p-value <0.001) with a concordance rate of 88.0%. Pyrogenic granuloma was a common differential diagnosis difficult to differentiate from KS by histopathology.

Conclusion: There is a need for histopathological analysis of all clinical KS suspicion and occasionally IHC confirmation of KS, especially when diagnostic features are inconspicuous or overlapping with other differential diagnoses such as pyrogenic granuloma

Keywords: *Kaposi's Sarcoma; Clinical Suspicion; Histopathology; HHV8-LANA-1 Immunohistochemistry; Concordance Rates.*

NC18: The relationship of mesencephalic astrocyte-derived neurotrophic factor with hyperlipidemia in patients with or without type 2 diabetes mellitus

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Background: Cardiovascular complications caused by hyperlipidaemia (HLD) remain the silent killer of T2DM patients, and their pathophysiological mechanisms remain unclear. Recently, studies have shown that the novel secreted protein MANF can regulate and alleviate endoplasmic reticulum stress-involved in many diseases including T2DM. This study was conducted to determine the relationship between MANF and lipid metabolism with or without T2DM.

Methods: Human serum samples were collected from 58 normal controls (NC), 40 subjects with hyperlipidaemia (HLD) without T2DM, and 42 subjects with HLD and T2DM. Their MANF levels were detected using an enzyme-linked immunosorbent assay (ELISA). Furthermore, the relationship between MANF levels and lipid indices was analysed.

Results: Serum MANF levels were found to be significantly higher in the HLD group, both with and without T2DM (5.62 (3.59–7.11) and 4.21 (2.87–6.11)), both $P < 0.001$, than in the NC (2.81(1.81–4.01)). In the HLD without T2DM group, MANF levels were negatively correlated with total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), and age, while LDL-C and age were independently related to MANF levels. The area under the curve (AUC) in the ROC analysis of MANF for the diagnosis of HLD without T2DM and HLD with T2DM was 0.709 and 0.841, respectively ($P < 0.001$).

Conclusion: Serum MANF levels increased in the HLD with or without T2DM groups and this was associated with lipid and glucose metabolism. MANF may be a useful marker for predicting the development of dyslipidaemia in T2DM.

Keywords: *Hyperlipidaemia; MANF; Type 2 Diabetes mellitus*

NC19: Sorafenib inhibited proliferation and cell cycle progression of hepatocellular carcinoma cells by downregulating aquaporin-3 through Raf/Mek/Erk signaling pathway

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Background: Reduced sensitivity of HCC cells to antitumor drugs, including sorafenib, is a major obstacle to achieving high overall survival in patients with advanced cancer, and its complexity is compounded by the lack of a full understanding of antitumor mechanisms. In recent years, studies have confirmed the catalytic role of aquaporin-3 (AQP3) in a variety of tumours including HCC, but none of the studies reported the regulatory mechanism of AQP3 during sorafenib treatment. This study examined the effect of sorafenib on the expression of AQP3 in HCC cells and determined whether the effect is associated with proliferation and cell cycle inhibition.

Methods: mRNA and protein levels of AQP3 in HCC cell models were detected via real-time quantitative polymerase chain reaction (qPCR) and western blotting, respectively. Cell counting kit -8 (CCK-8) was used to detect the effect of

AQP3 expression on cell proliferation, and flow cytometry was used to detect the changes of cell cycle and apoptosis.

Results: The results showed that AQP3 mRNA and protein levels were downregulated in a concentration dependent manner in all cell models exposed to sorafenib. Knockdown of AQP3 in the cell models successfully inhibited cell proliferation, and increased cell cycle arrest and apoptosis, while the reverse was true when AQP3 was overexpressed. In cell models with AQP3 knockdown, protein amounts of Erk, Akt, p53, p-Erk, p-Akt and cyclin-dependent kinase 2 (CDK2) decreased, while the amounts of cyclin-dependent kinase 4 (CDK4), p21 and p-p53 increased.

Conclusion: This study found that sorafenib may inhibit proliferation and cell cycle progression of HCC cells by regulating the expression of AQP3.

Keywords: *Aquaporin-3; Cell Cycle Progression; Proliferation; Sorafenib*

NC20: Incidence, Predictors and Outcome of Venous Thromboembolism among Patients Undergoing Major Surgical Procedures at Bugando Medical Centre, Mwanza, Tanzania

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Background: Venous thromboembolism (VTE) is the leading cause of morbidity and mortality worldwide among patients undergoing surgical procedures. This study aimed to determine the incidence, predictors, and outcome of VTE among patients undergoing major surgical procedures at Bugando Medical Centre (BMC).

Methods: A descriptive longitudinal study involving 381 participants was conducted from February 2020 to July 2020 at BMC. Patients with a high modified Caprini and modified Wells score underwent doppler ultrasound and computed tomography pulmonary angiogram to confirm presence of VTE. Post-mortem was performed on participants who succumbed to death prior to these investigations. Categorical variables significance calculated using Chi-square and Fisher's exact tests. Cox regression analysis was used to determine the predictors. Kaplan-Meier survival

curve used to depict the occurrence of VTE.

Results: The cumulative incidence of VTE was 11.8%. Age ≥ 45 years, body mass index ≥ 25 , hypertension and prolonged immobilization were significant predictors of VTE. Around 43.0% (n=164) were postoperatively classified as having a high risk of developing VTE. Of these, 27.7% (n=45) developed VTE (p<0.001) of which 14 patients died resulting in a mortality rate of 31.1%, and the mortality was significantly associated with males (p=0.013). Only 17.7% (n=29) of high-risk patients received VTE prophylaxis, however, prophylaxis was protective against development of VTE (p=0.023).

Conclusion: Venous thromboembolism is not uncommon among postoperative patients and is associated with high mortality rate. Appropriate VTE screening and prophylaxis is of paramount importance to lower VTE morbidity and mortality.

Keywords: *Venous Thromboembolism; Deep Venous Thrombosis; Pulmonary Embolism*

NC21: Thoracotomy in a child with large sized pneumatocele secondary to severe pneumonia

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Background: Pulmonary pneumatocele is a thin walled, gas-filled space within the lung parenchyma that regularly occurs in association with bacterial pneumonia or non-infectious causes, including trauma, and is usually transient. Pneumatocele is common among infants, children, adolescents and immunocompromised individuals and occurs in 2-8% in children with severe pneumonia. Depending on its aetiology, it commonly presents in children with chest pain, cough, mild fever and difficulty in breathing which may lead to respiratory failure if there is no prompt intervention.

Case report: We report a 21-month-old girl who presented with cough, difficulty in breathing and fever in whom diagnosis of severe community acquired pneumonia was reached based on the clinical

presentation and findings on chest x-ray. The child was initiated on broad-spectrum antibiotics; the condition worsened, hence follow up x-ray was carried out which revealed a large sized pneumatocele. The child was managed with intercoastal chest drain and later thoracotomy due to clinical deterioration and reappearance of other pneumatocele on control chest x-ray.

Conclusion: Pneumatocele is common among children with severe pneumonia and usually resolves spontaneously. Clinicians should have a high index of suspicion of pneumatocele which requires an appropriate prompt intervention in children with community-acquired pneumonia who do not improve on broad spectrum antibiotics.

Keywords: *Child; Severe Pneumonia; Pneumatocele; Thoracotomy*

NC22: Correlation of Myeloperoxidase, Neopterin and Lipopolysaccharide-Binding Protein as Markers of Environmental Enteropathy between HIV Infected and Non-infected Adults in Mwanza, Tanzania

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Background: Environmental enteropathy (EE) is associated with malnutrition in children; for HIV-infected individuals, EE relates with HIV progression, poor antiretroviral therapy (ART) response and non-communicable diseases. Despite its importance, EE diagnosis is still a challenge. Small intestinal biopsy is a gold standard test for EE but, in addition to being invasive, it has a lot of challenges. Plasma (e.g., lipopolysaccharide binding protein (LBP)) and faecal (e.g., Myeloperoxidase (MPO) and neopterin (NEO)) biomarkers have emerged as important diagnostic tools but none of them has been validated for diagnosing EE. To increase sensitivity, investigators have been using a combination of many biomarkers to diagnose EE, hence increasing burden and cost. This study aimed at determining the correlation between LBP, MPO and NEO biomarkers so as to reduce the burden of using many biomarkers for diagnosing EE.

Methods: This study was cross-sectional, involving 738 HIV-negative and positive

adults enrolled from REEHAD project conducted between May and August 2021 at National Institute for Medical Research, Mwanza, Tanzania.

Results: Mean age of participants was 42.3 (SD 11.4), majority 423 (57.3%) were females and 422 (57.2%) were HIV-positive on ART. MPO and NEO showed marginal positive correlation among HIV-negative participants ($r=0.20$, $P=0.08$), LBP and MPO & LBP and NEO showed no correlation. After stratifying by sex and age; significant correlation was observed between MPO and NEO in HIV-negative female ($r=0.28$, $P=0.04$), LBP and NEO in HIV-positive participants with 31-40 years ($r=0.45$, $P=0.01$) and between MPO and NEO in HIV-negative participants with 31-40 years ($r=0.51$, $P=0.004$).

Conclusion: LBP, MPO and NEO could be the adequate tests for EE but their correlation is modified by sex, age and HIV status. There is a need of developing few biomarkers that are not influenced by age, sex and HIV status.

Keywords: *Environmental enteropathy; Biomarkers; HIV infection*

NC23: Indication, early outcome and predictors of outcome of skin graft at Bugando Medical Centre Mwanza Tanzania.

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Background: Skin grafts are used in a variety of clinical situations, such as traumatic wounds, ulcers, defects after oncologic resection, burn reconstruction, scar contracture release etc. At Bugando Medical Centre, skin graft failure was noted to be associated with an increased duration of hospital stay and cost; hence, there was an urgent need to study predictors of outcome.

Methods: This was a longitudinal study aimed at determining indication, early outcome and predictors of outcome of skin graft at Bugando Medical Centre, Mwanza, Tanzania from October 2020 to June 2021. In this study, all patients undergoing skin graft for various indication were followed for 2 weeks for early outcome which included graft take and infection. If graft take was less than 80%, it was termed as graft failure. Statistical data analysis was done using STATA version 13.

Results: A total of 98 patients with 141 wounds were enrolled into the study the median age was 25.6. The median wound size was 80cm². The majority of wounds were located on lower limbs, 83 (58.9%).

Keywords: *Graft failure; Graft take; Graft success; Tanzania*

The commonest indication for grafted wound was traumatic skin loss 49 (34.8%) followed by burn injury in 36 (25.5%) of grafted wounds. The median percent take was 95%. The overall skin graft failure rate was in 32 (22.7%) wounds, postoperative infection rate was in 37 (26.2%) wounds grafted. Postoperative infection (p –value 0.01) was strongly associated with graft failure. Other factors associated with graft failure were haemoglobin <10g/dl (p-value 0.014), wounds located on lower limb (p-value 0.005), wound at joint or crossing joint (p-value 0.042) and comorbidity (p-value 0.018)

Conclusion: The commonest indication for skin graft was traumatic skin loss followed by burn injury. The median graft percent take was 95%. The graft failure rate was 22.7% and infection rate was 26.2%. The highest rate of graft failure was seen on lower limbs. Infection, haemoglobin<10g/dl, wound located on lower limb, comorbidity and wound crossing or at joint were significantly associated with graft failure.

NC24: Experiences of Women Receiving High Dose Rate Brachytherapy for Cervical Cancer at Ocean Road Cancer Institute Dar-es-Salaam, Tanzania

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Background: Cervical cancer is a health problem of the developing world, as approximately 84% of all women diagnosed with this disease live in developing regions. Late presentation and lack of treatment facilities contribute to the high death rate in developing countries where cervical cancer remains the second most common cancer (after breast cancer) among women of reproductive age. Worldwide, it is the third most common carcinoma after breast cancer and colorectal cancer. Most women diagnosed with cervical cancer in developing countries present at late stages when curative treatments are often no longer possible. Unlike other cancers, cervical cancer is almost 100% preventable by ensuring that women receive quality screening and treatment of precancerous lesions.

Methods: Qualitative descriptive study design was used. This study data was collected using Interviewer- Administered questionnaires for thematic analysis.

Results: The themes which arose from the study were patient perception, expectation and impressions, informational need and

psychological experiences. The study found the importance of provision of procedure information to patient which seems to improve their treatment experiences. The psychological experiences faced by patients before and during treatment included pain, distress, fear, humiliation and anxiety.

Conclusion: Within Tanzania, this was one of few studies that explained the experiences of women receiving high dose rate brachytherapy for cervical cancer. The study explained the perception, expectations and impressions toward brachytherapy, informational need by patients and psychological experiences. Patients should receive individualized education regarding the procedure, and the rotation of doctors and presence of observers could be minimized. Nurses should assess the level of pain women experience before, during and after receiving brachytherapy and, based on the findings, revise pain management protocols if needed. Non-drug options used in pain management could also be considered to complement pharmacological interventions.

Keywords: *Brachytherapy; Cervical Cancer; Experiences*

NC25: Indications, Outcomes and Prognostic Factors for Bowel Anastomosis Among Surgical Patients Admitted to Bugando Medical Centre, Mwanza Tanzania

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Background: Bowel anastomosis has for a long time been the most performed surgical procedure in the care of many gastrointestinal conditions and is associated with morbidity and mortality. This study aimed to find out common indications, surgical outcomes and predictors of outcome for bowel anastomosis at Bugando Medical Centre (BMC).

Methods: A longitudinal study enrolled participants undergoing bowel anastomosis at BMC from September 2020 to April 2021 was carried out. Data collected in Epidata v 3.1 and analysed using Stata v13.

Results: We studied 92 patients. Male outnumbered female by the ratio of 6:1. The median age was 16 years, patients age ranged from 3 days old to 86 years old. Intestinal stoma closure and intestinal atresia/stenosis were the most common indications for bowel anastomosis in children 24 (58.5%) and 2(20%) respectively, whereas sigmoid volvulus, colorectal tumours and bowel perforation were the

most common indications in adults 9 (90%), 6 (100%) and 9 (81.8%) respectively. Segmental bowel resection and right hemicolectomy were carried out in 84 (91.3%) and 8 (8.7%) patients respectively. Complications were found in 32.6%, and surgical site infections (52%) contributed the most. Median hospital stay was 8 (7-11) days and overall mortality 9 (9.8%). Advanced age ($p= 0.007$), emergency surgery ($p = 0.005$), entero-enteric anastomosis ($p < 0.001$), prolonged LOS \geq 14 days ($p < 0.001$) and elevated serum creatinine ($p = 0.041$) were the main prognostic factors associated with postoperative complications. Emergency surgery was significantly associated with mortality ($p = 0.010$) and postoperative complications ($p < 0.001$).

Conclusion: Bowel anastomosis is a commonly performed surgical procedure at BMC and is associated with prolonged length of hospital stay, increased morbidity and mortality. Good surgical judgment and alternative to anastomosis in the emergency setting should be considered.

Keywords: *Emergency Surgery; Bowel anastomosis; Mortality; Morbidity*

NC26: Blood pressure during the first two years of antiretroviral therapy in people living with HIV compared to HIV-uninfected individuals in north-western Tanzania

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Background: High blood pressure (BP) is the main driver of cardiovascular diseases in people living with HIV (PLWH). PLWH may experience a rapid increase in BP during the first two years of antiretroviral therapy (ART). We investigated predictors of change in BP in PLWH compared to HIV-uninfected.

Methods: A longitudinal analysis of data from PLWH and HIV-uninfected adults enrolled in a study of diabetes and associated complications was carried out in Mwanza, Tanzania. A structured questionnaire was used to collect data on socio-demography, smoking, alcohol and physical activity at enrolment visit. History of ART use, and anthropometry and BP measurements were taken at baseline, first year and second year visits. We analysed enrolment blood samples for creatinine, glucose, C-reactive protein, α -acid glycoprotein, insulin, full blood count and HIV. Predictors of BP change over time were determined using mixed effect linear regression adjusted for age, sex and body mass index (BMI) *a priori*.

Results: We enrolled 916 PLWH starting ART and 369 HIV-uninfected adults of whom 588

PLWH and 257 HIV-uninfected up to second year follow up visit. The mean age was 38 (SD=11) and 60% were females. The mean systolic BP (mmHg) in PLWH increased from 112 at baseline to 115 (both SD=18) at second year follow up visit ($p=0.006$) but decreased from 125 to 121 (both SD=19) in HIV-uninfected adults ($p=0.003$). In the overall study population, factors significantly associated with higher BP were increasing age, male sex, alcohol consumption, higher BMI, higher CD4⁺ T-cell count and higher white cell count. HIV infection, current smoking, physical inactivity, raised C-reactive protein, raised α -acid glycoprotein and anaemia were significantly associated with lower BP.

Conclusion: BP increased in PLWH during the first two years on ART. BP screening programs and interventions targeting modifiable risk factors such as overweight and alcohol consumption are warranted in PLWH.

Keywords: Blood pressure; HIV; People Living with HIV; Antiretroviral Therapy

NC27: Systemic Inflammatory Response Syndrome as a Predictor of Outcome in Surgical Abdominal Emergencies Admitted at Bugando Medical Centre, Mwanza, Tanzania

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Background: Systemic inflammatory response syndrome (SIRS) is a clinical response to sepsis or trauma. SIRS is associated with adverse outcome in surgical emergencies. This study evaluated the predictive value of SIRS as a prognostic indicator of outcome, in term of hospital stay, need for Intensive Care and Death among abdominal emergencies admitted at Bugando Medical Center.

Methods: This was prospective cohort study involving abdominal emergencies admitted from November 2020 to May 2021. Detailed history, physical examination and assesment for SIRS criteria was done at admission. Threerafter, appropriate operative or non operative management were offered according to diagnosis, and patients were followed up for outcomes till discharge. Data collected was entered in Microsoft excel 2007 and analyzed using STATA version 13.

Results: During the study period a total of 200 patients were eligible to be enrolled

into the study with their ages ranged from 1 month – 87 years and the median age of 29 [IQR 11 – 41.5] years, male patients were 50.5% (101/200). The prevalence of SIRS positive was 47% (94/200). SIRS positive patients were significantly more likely to admitted in HDU and ICU 46.8% (44/94) and 21.3% (20/94) respectively, compared to 26.4% (28/106) and 1.9% (2/106) for SIRS negative (p-value=0.001), Moreover it associated with prolonged hospital stay compare to SIRS negative 10days versus 6 days (OR 3.4; 95% CI [1.7 – 6.9]; p-value<0.001), not only that but also SIRS positive was associated with high number of death, among all death 80% (24/30) (OR=5.7; 95%CI [2.2 - 14]; p-value<0.001) were SIRS positive.

Conclusion. Systemic inflammatory response syndrome is common in abdominal emergencies. Screening for SIRS is important and health care workers should priorities SIRS positive patients and considered as high-risk patients as they are associate with adverse outcomes.

Keywords: *Systemic Inflammatory Response Syndrome; Surgical Abdominal Emergencies; Outcome.*

NC28: “...We add plastic burn for a taste”: Salient Indoor Air Pollution burden in Urban Informal Settlements in Mwanza City.

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Background: Indoor air pollution (IAP) has been ranked into 10th global health risk due to its contributions to ill health. People living in urban informal settlements are vulnerable to being exposed to IAP because they live in houses that are of poor quality which are not well-ventilated, and they may not afford to use electricity or gas for domestic purposes. Smokes from the cooking fuel generate harmful particulate matters which are inhaled leading to a higher risk of developing communicable diseases and non-communicable diseases. The content and composition of the cooking materials determines the type and number of hazards produced. The biomass fuel used in informal settlements have not been explored. The aim of the study is to explore community risk behaviours regarding IAP in informal settlement in Mwanza city, North-western Tanzania.

Methods: This was an ethnographic qualitative study using in-depth interviews, focused group discussions,

and key informant interviews analysed using thematic content analysis.

Results: The findings highlight a range of concerns regarding IAP. Indoor cooking and the use of rubber and plastic materials are the common practices and risk behaviour for IAP. Rubber, plastic materials and artificial used hair were more preferable by the informal settlements' dwellers due to their accessibility as they are found everywhere in their environment. Plastic materials were perceived as: *i*) Cooking food faster as they ignite so well and burn for long time without lighting off. *ii*) Providing a good taste to food compared to other source of cooking fuel. *iii*) Providing an attractive colour and good taste preferred by smoked fish consumers.

Conclusion: The use of plastic and rubber materials among informal settlement dwellers is very common yet salient public health problem in North-western Tanzania and call for an emergency intervention.

Keywords: *Indoor Air Pollution; Cooking Fuel; Urban Informal Settlements*

NC29: Magnitude of Partograph Use and Factors Affecting its Utilization among Obstetric Caregivers in the Selected Public Health Facilities of the Municipal of Mwanza City, Tanzania, 2019

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Background: Labour and delivery are unpredictable events, which can result in a disabled or a fatal state. WHO promotes the use of partograph to monitor and improve the management of labour and to support decision-making regarding interventions. However, little is known about the status of knowledge and utilization of the partograph in Tanzania. This study aimed to assess the level of knowledge of the partograph and its utilization among obstetric care providers in selected public health institutions of Mwanza City, Tanzania.

Methods: A mixed method, quantitative and qualitative facility-based prospective cohort study was conducted from June to November 2019, in randomly selected facilities of Mwanza City: one tertiary consultation and teaching hospital, one regional hospital, one district hospital and one health centre.

Results: A total of 128 (100%) health workers participated in the study. The perceived prevalence of partograph use

was 97.4%, but observation among 412 clients in the labour ward indicated that only five items out of fifteen parameters listed on the partograph were completely filled; the rest was either estimated by the health workers or not taken at all. In bivariate analysis, the factors found to be significantly associated with partograph utilization were: respondent services year (>7yrs) (COR=7, CI=2.5-19.5), profession (Midwifery) (COR=11, CI=2.6-47.5), Work institutions/place (Hospital) (COR=4, CI=1.4-11.3), and training (COR=5, CI=1.9-14.2) and attitude of obstetric care providers towards partograph utilization.

Conclusion: Though a high proportion of obstetric care providers use partograph to follow the progress of labour, our findings indicated that continued monitoring of maternal and fetal condition was lacking. This might affect proper identification of the action line which will further affect maternal and fetal outcome. Thus, WHO standards for recording in the partograph should be accessible to all institutions using the partograph to maintain consistency in its utilization.

Keywords: *Pregnancy outcome; Utilization of partograph*

SUB-THEME: INFECTIOUS DISEASES AND ANTIMICROBIAL RESISTANCE (IDAR)



IDAR1: One-year antimicrobial resistance surveillance in the cascade of referral health care system in Mwanza, Tanzania

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Background: Surveillance is the basis of evidence-based infectious diseases' management. Previous studies on bloodstream infections (BSI), urinary tract infections (UTI), and skin and soft tissue infections (SSTI) were largely based at the tertiary hospital, limiting holistic interventions in all tiers of the health-care systems in Mwanza.

Methods: This hospital-based surveillance was conducted between June 2019 and June 2020 involving 2,316 patients attending three district (n=1180), one regional referral (n=494) and one tertiary (n=642) hospitals. Data and samples (blood, pus and urine) were collected and processed following standard guidelines.

Results: A total of 2,647 samples were collected. Approximately 13.8% (148/1075), 27.8% (119/428) and 21.8% (249/1144) of blood, pus and urine samples

had positive culture growth, connoting BSI, SSTI and UTI, respectively. Percentages resistance of Gram-negative bacteria (GNB) from blood, pus and urine samples to ampicillin were 96.4%, 94.0% and 94.7%; and to gentamicin were 54.3%, 46.1% and 35.1%, respectively. About 43.8% (57/130), 34.9% (36/103) and 22.8% (49/215) of GNB from blood, pus and urine were extended spectrum β -lactamase (ESBL) producers rendering them resistant to ceftriaxone. Culture positivity was significantly more in tertiary than regional and district hospitals.

Conclusion: There is high resistance to the first- and second-line antibiotics for BSI, SSTI and UTI, therefore, antimicrobial therapies should be guided by laboratory results. Antimicrobial resistance surveillance at regional and district hospitals is feasible.

Keywords: *Surveillance; antimicrobial resistance; Mwanza.*

IDAR2: Prevalence and factors associated with Group B *Streptococcus* bovine mastitis in Mwanza, Tanzania

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Background: Group B *Streptococcus* (GBS) is a normal microbiota in humans, and a common cause of maternal-fetal infections. It also causes bovine mastitis with significant economic loss in dairy industry. Limited information exists on its occurrence in cattle in Mwanza.

Methods: A cross-sectional analytical study was conducted in Nyamagana, Ilemela and Sengerema, Mwanza between June and August 2021. A total of 506 milk samples from cows were collected and cultured on *CHROMagar*TM *StrepB* using standard guidelines.

Results: A total of 114 (22.5%) cows were infected with GBS. The risk factors associated with GBS bovine mastitis were exotic breed (p-value=0.010) and zero-

grazing (p-value=0.034). The odds of GBS bovine mastitis were high in cows whose livestock keepers have never used and those who rarely use laboratory services [OR, 95%CI: 2.30 (1.24-4.38); p-value=0.0047] and [OR, 95%CI: 2.94 (1.59-5.57); p-value=0.0002], respectively. All GBS were resistant to tetracycline, whereas the majority of isolates were sensitive to penicillin (99.2%), vancomycin (97.5%) and azithromycin (90.4%).

Conclusion: GBS bovine mastitis prevalence is high in Mwanza, and its risk highlights potential transmission within herds. Penicillin is still effective against GBS. Typing these strains and correlate them with humans' strains will guide specific preventive measures.

Keywords: *Bovine mastitis; Group B Streptococcus; Mwanza*

IDAR3: Conjugative plasmids disseminating CTX-M-15 among Enterobacteriaceae from human, animals and the environment in Mwanza Tanzania: A need to intensify One Health Approach

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Background: Globally, *bla*_{CTX-M-15} beta-lactamases are the most popular extended spectrum beta-lactamase (ESBL) alleles that are widely distributed due its mobilization by mobile genetic elements in several compartments. We aimed to determine the conjugation frequencies and replicon types associated with plasmids carrying *bla*_{CTX-M-15} gene from ESBL producing isolates in different compartments.

Methods: A total of 51 archived isolates carrying *bla*_{CTX-M-15} beta-lactamases were used as donors. Antibiotic susceptibility tests were performed for donors and transconjugants. Conjugation experiment was performed by a modified protocol of the plate mating experiment, and plasmid replicon types were screened among donor and transconjugant isolates by multiplex Polymerase Chain Reaction.

Results: The conjugation efficiency of plasmids carrying *bla*_{CTX-M-15} was 88.2%

(45/51) with conjugation frequencies in the order of 10⁻¹ to 10⁻⁹ and a 100% transfer efficiency observed among *E. coli* of animal origin. Majority of donors (*n* = 21) and transconjugants (*n* = 14) plasmids were typed as either Inc FIA or Inc FIB. Resistance to non-beta-lactam antibiotics was transferrable in 34/45 (75.6%) of events. Ciprofloxacin, tetracycline and trimethoprim/sulphamethoxazole resistance was co-transferred in 29/34 (85.3%) such events. Gentamicin resistance was transferred in 17/34 (50%) of events.

Conclusion: The majority of plasmids carrying *bla*_{CTX-M-15} were conjugatively transferred by IncF plasmids along with non-beta lactam resistance. One Health approach should be intensified to delineate how multi replicon plasmids interact and their effects on conjugation so as to curb antimicrobial resistance.

Keywords: Conjugation; CTX-M-15; replicon; plasmid; One-health

IDAR4: Effectiveness of antiseptics in the bacterial load reduction before and after septic wound dressing at Bugando Medical Centre, Mwanza, Tanzania

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Background: Septic wounds due to multidrug resistant bacteria (MDR) are costly, and potentially result into adverse patients' outcomes. Despite the fact that various antiseptics are routinely used, their effectiveness remains to be evaluated.

Methods: A cross-sectional analytical study was conducted among 203 patients with septic wounds at Bugando Medical Centre (BMC). Wound swab samples before and after dressings were collected, and cultured to quantify the total bacteria load using standard operating procedures.

Results: Half of the wounds were due to road traffic accidents. A total of 146 (71.9%) had positive culture results. The proportions of extended spectrum beta lactamase producing Gram negative

bacteria and Methicillin-resistant *Staphylococcus aureus* were 34.3% and 41.9%, respectively before dressing (and were reduced to 20.2% and 20.2%, respectively after dressing). The median (IQR) of total bacteria load before and after dressing were 207 (113-330) and 129 (35-235) CFU/mL, respectively (p-value<0.001), notably by povidone iodine compared to other antiseptics. Reduction was also associated with antiseptics' dilution status.

Conclusion: Povidone iodine significantly reduced the total bacteria and the MDR bacteria load in septic wounds. Antiseptic dilution guidelines should be re-visited at BMC. Assessment of the active ingredients in the antiseptics will be of interest in future studies.

Keywords: *Septic wounds; Antiseptics effectiveness; Bugando; Tanzania*

IDAR5: Dolutegravir and weight gain to adolescents living with HIV/AIDS at Baylor Mwanza –Tanzania

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Background: Dolutegravir(DTG) has been approved for the use in adolescents with HIV. It's highly effective and is well tolerated drug by adolescents and adults. DTG is an integrase strand inhibitor that has been associated with weight gain in adults, however this relationship has not been described in adolescents at Baylor, Mwanza.

Methods: A retrospective study was conducted at Baylor clinic in Mwanza – Tanzania from January to December 2020. It involved all adolescents living with HIV who are on DTG-based regime for more than six months. Demographics and clinical data were collected from electronic medical record. Comparison of the weight before and after being on DTG for six months was done.

Results: A total of 229 adolescents were enrolled, 43.2% were female, 159 (69. 4%)

had stage III and IV, 220/229 (96.0%) were virally suppressed with CD4>350cells/mm³ in 222/229 (96.9%) patients. A total of 165 (72%) had good adherence to ART. Overweight before DTG initiation was documented in 4/229 (1.8%), and after six months on this regimen, 206/229 (90%) adolescents gained weight. Of these, 173/206 (84%) adolescents gained 0.5gm to 10gm (0.1% to 23.3%), 16/206(7.7%) were overweight and 4/206(1.8%) were obese.

Conclusion: Majority of adolescents who used DTG presented with weight gain, some of them had overweight and obese that may be associated with this regimen. There is need to conduct more studies with large sample size for a longer period of time on DTG and weight gain in adolescents.

Keywords: *Dolutegravir; weight gain; adolescents; overweight*

IDAR6: Multidrug resistance and epidemiological cut-off values of *Escherichia coli* isolated from domesticated poultry and pigs reared in Mwanza, Tanzania: a cross-sectional study

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Background: The burden of multidrug resistant bacteria is increasing drastically and poses a major threat to human and veterinary medicine globally as it is associated with increased morbidity and mortality. Currently there is limited information on the resistance profiles and epidemiological cut-off values (ECVs) of *E. coli* isolated from poultry and pigs in Mwanza, Tanzania.

Methods: This cross-sectional study conducted between June and August 2021 involving 297 pigs, 191 broilers and 203 layers reared in Mwanza. Rectal and cloacal swabs were collected and processed to isolate *E. coli* followed by antimicrobial susceptibility testing by disk diffusion method as per standard operating procedures (SOPs). ECVs were determined using a computer software Normalized Resistance Interpretation (NRI) and descriptive analysis was performed using STATA version 13.

Results: About 95.1% (657/691) *E. coli* were isolated: pigs (n=283), broilers (n=190) and layers (n=184). Overall, the multi-drug resistant (MDR) *E. coli* were observed in

63.2% (415/657; Pigs 31.8%, Broilers 86.3%, and Layers 87.5%, p<0.001) while extended spectrum β -lactamase (ESBL) production was observed in 17.8% (117/657) significantly high among isolates from layers (Layers 30.9%, Broilers 5.3% and pigs 17.7%, p<0.001). Based on ECVs of antibiotics tested, *E. coli* from broilers, layers and pigs exhibited different population with the majority of *E. coli* from broilers and layers being non-wild-type to commonly used antibiotics. Exotic breeding, and recent antimicrobial use (both p<0.001) was found to predict MDR colonization among poultry and pigs.

Conclusion: *E. coli* isolated from poultry are more resistant to commonly used antibiotics than *E. coli* isolates from pigs. Distinct populations of *E. coli* were circulating in layers, broilers and pigs based on ECVs of different antibiotics tested. Advanced technique i.e., whole genome sequence is warranted to fine-tune the diversity and monitor the emergence of resistant strains/genotypes of *E. coli* in poultry and pigs.

Keywords: *Multidrug resistance; poultry; pigs; Escherichia coli; Tanzania*

IDAR7: Schistosomiasis in the Bezi Island, north-western Tanzania: Prevalence, intensities of infection and performance of the point-of-care Circulating Cathodic Antigen tests among pre-school and school aged children

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Background: Planning and implementation of mass drug administration requires an understanding of geographical distribution of the target disease and where the at-risk population live. However, mapping surveys are rarely done in communities living in hard-to-reach areas.

Methods: Cross-sectional study was conducted among pre-school (n=161) and school aged (n=200) children attending Bezi Primary Schools. Data were collected using questionnaires. Urine and stool samples were collected and screened for *S. mansoni* infection using Point-of-Care Circulating Cathodic Antigen test (POC-CCA) and Kato Katz (KK) technique.

Results: Of the included children, 44.0% were boys. The overall mean age was 8.03 ±3.25 years. The prevalence of *Schistosoma mansoni* was 70% (95%CI: 61.8–77.1) and 70.2% (95%CI: 62.5–76.8) using KK

technique and POC-CCA, respectively. There was no sex difference but the age group 9-16 years had the highest prevalence on KK technique ($P=0.04$). Approximately 28.5%, 26.5% and 44.9% of the children had low, moderate and heavy intensity of infection. The geometrical mean egg per gram of faeces was 302epg (95%CI: 221.6-411.9), with no sex ($t=0.3062$, $P=0$) and age ($t=0.3421$, $P=0.7$) differences. The overall sensitivity, specificity, negative and positive predictive values were 81.6%, 52.4%, 80% and 55%, respectively.

Conclusion: Bezi island is endemic for *S. mansoni* infection and children are carrying heavy intensity of infection. Specificity of the POC-CCA test remained unsatisfactory. School and community-based MDA are highly recommended.

Keywords: *Schistosoma mansoni*; prevalence; school children; northwestern Tanzania

IDAR8: Prevalence of *Mycobacterium tuberculosis*, other bacterial and co-infections among presumptive cases of tuberculosis at selected hospitals in Mwanza, Tanzania: a cross-sectional laboratory-based study

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Background: Co-infections of tuberculosis (TB) and other bacterial pathogens is associated with high morbidity and mortality due to diagnostic challenges and improper patients' management. However, these co-infections are rarely taken into considerations when attending presumptive cases of TB in Mwanza, Tanzania.

Methods: This cross-sectional laboratory-based study was conducted at Bugando Medical Centre, Sekou Toure Regional Referral Hospital and Sengerema Designated District Hospital involving 264 sputum samples from presumptive cases of TB from June to August 2021. Diagnosis of TB was done by GeneXpert and other bacterial by conventional culture and sensitivity. STATA version 13.0 was used for data analysis.

Results: The median [IQR] age of participants was 33[19-51] years. Most were males 59% (158/264), and enrolled

from BMC 41.3% (109/264). About 7.2% (19/264), 17.8% (47/264) and 1.1% (3/264) of participants had TB, other bacterial pathogens and co-infections, respectively. Two bacterial pathogens were isolated from 4 sputa resulting to 51 pathogens with the majority of Gram-negative bacteria (GNB) 76.5% (39/51). *K. pneumoniae* complex 35.3% (18/51) followed by *S. pneumoniae* and *S. aureus* (both 11.7%, n=6) were predominant. GNB were more resistant to ampicillin 94.9% (37/39), tetracycline 66.7% (26/39) and azithromycin 61.5% (24/39). Good quality sputa had significantly higher yield of pathogenic bacteria than poor quality sputa (38.5% vs. 9.1%, p<0.001).

Conclusion: Most of presumptive cases for TB are infected with other bacterial pathogens, which should be considered while diagnosing and managing these patients.

Keywords: *Mycobacterium tuberculosis*; other bacteria; co-infections; tuberculosis

IDAR9: Hepatitis B co-infection with *Schistosoma mansoni* is an independent risk factor for central periportal fibrosis and esophageal varices in a *Schistosoma* endemic area in Northwestern Tanzania

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Background: In patients with chronic *S. mansoni* infection, co-infection with Hepatitis B, C, and/or HIV may accelerate progression to end-stage liver fibrosis. In this study, we compare the severity of periportal fibrosis (PPF) and prevalence of varices between patients with and without co-infection.

Methods: This is a cross-sectional study nested in a longitudinal cohort study of adults with PPF. The Niamey protocol was used to diagnose PPF sonographically and endoscopy was performed to screen for varices. Socio-demographic data was collected and laboratory tests for *S. mansoni*, hepatitis B/C, HIV, and liver function tests were obtained.

Results: 422 patients were enrolled. 101 (23.9%) tested positive for hepatitis B, C or HIV and 215 (51.0%) tested positive for *S. mansoni*. Of those who tested positive for Hepatitis B, C, and HIV, 24 (n=42; 57.1%; 95%CI: 41-72.3%), 18 (n=38; 62.1%; 95%CI: 42.3-79.3) and 26 (n=29; 68.4%; 95%CI: 51.3-82.5%) were co infected with *S. mansoni*

respectively. Central PPF was independently associated with hepatitis B-*S. mansoni* co-infection, (aOR: 4.2; p=0.003). Esophageal varices were independently associated with hepatitis B infection, (aOR: 2.0, p<0.001). Patients with Hepatitis B-*S. mansoni* co-infection additionally had elevated serum alanine aminotransferase levels, (aOR: 1.3; p<0.001) and lower serum albumin (aOR: 1.2; p=0.006) as compared to those without co infection.

Conclusion: Hepatitis B, C and HIV and co-infection with *S. mansoni* were common in this study. The finding that hepatitis B and *S. mansoni* co-infection was independently associated with central PPF and presence of elevated ALT levels with lower serum albumin suggests a possible contribution of hepatitis B to the severity of Schistosoma-related periportal fibrosis and its attendant complications. Routine screening for, and treatment of, these co-infections is likely to reduce morbidity and mortality in patients with *S. mansoni* infection.

Keywords: *Schistosoma* periportal fibrosis; *Schistosoma* endemic area; Hepatitis B & C and HIV; *S. mansoni*, co-infection, central periportal fibrosis, esophageal varices, northwestern Tanzania,

IDAR10: Presence, size, and bleeding of esophageal varices is linearly correlated with central periportal fibrosis among adults in Schistosoma endemic area in Northwestern Tanzania

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Background: *Schistosoma mansoni* related periportal fibrosis (PPF) is a major risk factor for esophageal varices but neither liver ultrasound nor endoscopic screening of patients with PPF is regularly performed endemic areas. This study aimed at measuring the association between PPF and esophageal varices as well as the factors associated with PPF in adults living in endemic areas

Methods: A cross-sectional study was conducted among patients attending Bugando, Sekou Toure, Sengerema, and Buchosa. Ultrasound was used to screen for PPF according to the Niamey protocol. Participants with PPF were endoscopically screened for varices and their demographic and clinical data were collected.

Results: In total 422 patients were included in this study; 179 of 422 (42.4%) had esophageal varices. The presence of esophageal varices was positively correlated with severity of periportal fibrosis: 171 of 179 (95.5%; $p < 0.001$) occurred among those with central PPF. 96 (53.6%)

had large varices and 71 (39.7%) had presented with upper gastrointestinal bleeding. Both the size and risk of bleeding were linearly correlated with severity of PPF: 98.0% of all large varices, (χ^2 : 24; $p < 0.001$) and the subsequent risk of bleeding, (χ^2 : 15.9; $p < 0.001$) occurred among those participants with central PPF. Overall, 346 (82.0%) had central PPF, which was associated with age > 45 years (adjusted odds ratio (AOR): 1.02; $p < 0.001$), fishing, (AOR: 7.5; $P < 0.001$), domestic use of lake water, (AOR: 6.8; $p < 0.001$), sonographically larger splenic size, (AOR: 1.1; $p = 0.002$), portal vein diameter, (AOR: 1.3; $p < 0.001$) and presence of esophageal varices on endoscopy (AOR: 1.5; $p < 0.003$).

Conclusions: The prevalence of esophageal varices was high in this study, and a large proportion of patients presented with bleeding varices. These results suggest that patients with central PPF should be prioritized for early endoscopic screening and treatment of esophageal varices.

Keywords: *Schistosoma periportal fibrosis; central periportal fibrosis; endoscopic screening; esophageal varices; bleeding varices; predictors of central periportal fibrosis*

IDAR11: Routine clinical parameters have high sensitivity and negative predictive value in identifying patients with esophageal varices in a Schistosoma endemic area: a prospective cohort study

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Background: Esophageal varices are a common cause of mortality among patients with periportal fibrosis (PPF) in *S. mansoni* endemic areas. Routine endoscopic screening of patients with PPF before hemorrhage occurs has not yet been adopted as a routine. We aimed to identify routine clinical variables and liver ultrasound variables for identifying patients with varices so that those patients can be prioritized to undergo endoscopic screening in low-resource settings.

Methods: This is a cross sectional study of an adult population with PPF. The Niamey protocol was used to sonographically identify patients with PPF; endoscopy was performed on all participants to screen for varices. Socio-demographic, clinical, and laboratory information were analysed. Determinants of esophageal varices were determined by a generalized linear model

Results: In total 422 patients with PPF were included in this study. Of the studied participants 179 (42.4%) had varices, of

which 96 (53.6%) were large. The presence of varices was independently associated with older age in years (aOR: 1.02; $p=0.001$); abdominal distension, (aOR: 2.5; $p<0.001$), spleen size >13.3 cm (aOR: 2.9; $p<0.001$); ascites (aOR: 4.5; $p<0.001$); central PPF (aOR: 1.6; $p<0.008$), and Platelet to Splenic Diameter Ratio (PSDR) < 8137.9, (aOR: 1.9; $p=0.001$). Also, large varices were independently associated with male gender (aOR: 4.0; $p<0.001$) large spleen (aOR: 4.5; $p<0.001$), ascites (aOR: 4.3; $p<0.001$), central PPF (aOR: 4.5; $p<0.001$); and PSDR<5874.1 (aOR: 1.9; $p=0.002$). Abdominal distension, fishing and large spleen or central periportal PPF had highest SE and NPV.

Conclusion: Esophageal varices were frequently diagnosed upon endoscopic screening of patients with periportal fibrosis in this study. Patients who present with abdominal distension and fishing, and are found to have a large spleen and or central PPF should be prioritized for endoscopic screening of varices.

Keywords: *S. mansoni*; Schistosoma periportal fibrosis; endoscopic screening; predictors of esophageal varices; sensitivity and specificity; predictive value, resource limited setting

IDAR12: “Female Genital Schistosomiasis is transmitted through Sexual Activity”: A qualitative study on healthcare workers’ knowledge of female genital schistosomiasis in Zanzibar, Tanzania

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Background: Urogenital schistosomiasis is endemic in Zanzibar. Although the same parasite causes female genital schistosomiasis (FGS), little is known about the capacity of healthcare facilities (HCFs) to manage it. A qualitative study was conducted to explore healthcare workers’ (HCWs’) knowledge, perceptions, and attitudes on FGS, their capacity to manage FGS cases, and the challenges HCWs face in managing FGS.

Methods: Focus Group Discussion (FGDs) and Key Informant Interview (KIIs) were conducted among HCWs in different HCFs. A total of 4 FGDs and 16 KIIs were conducted in seven (7) purposively selected districts of Zanzibar and included HCWs from 14 healthcare facilities. Data were coded deductively and inductively using NVivo software and analysed following thematic analysis approach.

Results: Generally, HCWs were aware of urogenital schistosomiasis, aetiology, symptoms, modes of transmission, and groups at risk of the disease. Most HCWs lacked the knowledge of FGS. Some participants thought that FGS is transmitted through sexual activity. HCWs also confused FGS and other sexual transmitted infections (STIs). Since the symptoms are similar, the community tends to stigmatize women and girls with FGS, associating it with promiscuity. HCWs lacked knowledge and skills to manage FGS.

Conclusion: There was a knowledge gap about FGS among HCWs and HCFs lacked the diagnostic capacity. The findings call for the need to fill these gaps through training HCWs on FGS and equip HCFs with medical equipment and supplies for managing FGS.

Keywords: *Female Genital Schistosomiasis; qualitative study; healthcare workers’ knowledge*

IDAR 13: Proportions and co-existence of genes encoding for carbapenems resistance in Gram-negative bacteria at Bugando Medical Centre in Mwanza, Tanzania: a cross-sectional laboratory-based study

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Background: Carbapenems are increasingly used in low- and middle-income countries (LMICs) especially in ICU settings. The role of colonization and hospital contamination in harboring carbapenem-resistant Gram-negative bacteria (CR-GNB) is not clearly known in most of LMICs. This study determined carbapenems resistance genes from phenotypically confirmed CR-GNB isolated from clinical, colonization and hospital surfaces samples in intensive care units (ICUs) at BMC, Mwanza-Tanzania.

Methods: A total of 64 archived GNB (43 *Acinetobacter* spp., 10 *K. pneumoniae* complex, 7 *E. coli*, 2 *P. aeruginosa* and 2 unidentified GNB) resistant to meropenem isolated from bed (n=36), rectal swabs (n=14), blood (n=9) and urine (n=5) samples were tested for carbapenemase productions using Modified Hodge test (MHT), combined disk test (CDT) and double disk synergy test (DDST). Singleplex PCR assay was used to detect *bla*_{OXA-48}, *bla*_{IMP} and *bla*_{KPC}. Data was analyzed by STATA version 13.0.

Keywords: Antimicrobial Resistance; Carbapenems Resistance; Gram-Negative Bacteria; Modified Hodge Test.

Results: Positive phenotypes were detected in 60.9% (39/64) by DCT and DDST (both), and 31.3% (20/64) by MHT. A total of 68.8% (44/64), 35.9% (23/64) and 23.4% (15/64) were confirmed to have at least one, two or three phenotypes, respectively. A total of 23 (35.9%) had at least one gene encoding for carbapenems resistance with the predominance of *bla*_{IMP} 91.3% (21/23). About 47.7% (21/44) of phenotypic confirmed CR-GNB had at least one gene. Around 47.8% (11/23) of CR-GNB are carrying multiple genes encoding for carbapenems resistance with the most combination of *bla*_{IMP}/*bla*_{KPC}/*bla*_{OXA-48} 45.5% (5/11). The majority of carbapenems resistance genes were detected in *Acinetobacter* spp., 82.6% (19/23) and isolated from bed swabs 73.9% (17/23).

Conclusion: Hospital beds in ICUs at BMC are contaminated with carbapenemase producing *Acinetobacter* spp. We recommend routine decontamination of inanimate hospital surfaces including patient beds.

IDAR14: Intestinal schistosomiasis in adult population at Ukerewe island: Prevalence and intensities

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Background: In Tanzania, adult population are not part of the mass drug administration (MDA) campaign against schistosomiasis using praziquantel drug. The current Else Kröner Centre for advanced medical studies supports covering the gap on Ukerewe District through a holistic set of community-based interventions, including mass drug administration for adults. Baseline study was conducted gather information on prevalence and intensities of schistosomiasis infection.

Methods: A single stool and urine sample was collected from 3,102 participants from 15 villages and screened for *Schistosoma mansoni* infection using Kato Katz (KK) technique and point-of-care circulating cathodic antigen (POC-CCA) test. A questionnaire was used to collect demographic and clinical history.

Results: Of all the participants, 49.8% (1545/3102) and 50.2% (1557/3012) were female and male respectively. The overall mean age of the participants was 45 ± 16.4 years. A total of 0.2%, 1.5% and 12.7% of the participants reported to have active

blood vomiting, ever vomited blood and had episodes of blood in stool. The overall prevalence of *S. mansoni* based on the POC-CCA was 84.4% (95%CI:83.4-85.9) with no difference between sex (84.4% for female *versus* 85.5% for male, $\chi^2=0.5889$, $P=0.4$). Based on KK, the overall prevalence of *S. mansoni* was 28.5% (95%CI: 26.9-30.1), with male having the highest prevalence than female (31.5% *versus* 25.9%, $\chi^2=10.2697$, $P=0.001$). The Geometrical mean egg per gram of faeces was 105epg (95%CI:97.5-113.3), with male participant having the highest GMepg ($t=3.6955$, $P=0.001$). In term of infection intensities, 53.6%, 34.1% and 12.7% had low, moderate and heavy intensities.

Conclusion: Intestinal schistosomiasis is a public health concern among the adult. Implementation of community-based MDA which include adults is highly recommended. Integrating other supplementary measures such as improved sanitation, water and hygienic measures to support mass drug administration will be required to reach elimination stage.

Keywords: *Intestinal schistosomiasis; adults; Ukerewe island; Tanzania*

IDAR15: Molecular characterization of urogenital pathogens in urine samples of clinically diagnosed urinary tract infections patients in Tanzania: A Laboratory based cross sectional study.

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Background: Urogenital pathogens such as *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Mycoplasma genitalium* and *Trichomonas vaginalis* have been reported to cause pyuria, however are not routinely cultured from urine samples in many laboratories. This has led to the delay in diagnosis and mismanagement of patients which prime complications like cervicitis, urethritis, infertility and pelvic inflammatory disease.

Methods: A cross sectional study involving 227 archived urine samples from clinically diagnosed UTI patients with positive leucocyte esterase but negative culture results was conducted. The urogenital pathogens were detected using pathogen specific PCR. Data were cleaned and analyzed using STATA version_15.

Results: The median age of patients was 31[IQR 23 – 51] years and majority 174 (76.7%) were female. Two thirds of patients

had history of antibiotics use two weeks prior to recruitment 154(67.8%). Overall at least one urogenital pathogen was detected in 62(27.3%) of urine samples (*Neisseria gonorrhoea* 25(11.0%), *Trichomonas vaginalis* 24(10.6%), *Mycoplasma genitalium* 13(5.7%) and *Chlamydia trachomatis* 11(4.9%)). Ten (16 %) samples had more than one pathogen. Being female (OR 2.4; 95% CI: 1.04 – 5.49; P 0.039) and having history of using antibiotics in the past two weeks (OR 1.9; 95%CI: 1.04 – 3.60; P 0.036) independently predicted the presence of urogenital pathogen.

Conclusion: Significant proportion of female patients with symptoms of UTI, pyuria and negative urine culture are infected by non-culturable urogenital pathogen. There is a need of revising urine diagnosis protocol to include additional tests for detection of urogenital pathogens.

Keywords: Urogenital pathogen; Pyuria; UTI culture negative; leukocyte esterase

IDAR16: Antibacterial Consumption in Internal Medicine Wards at Bugando Medical Centre, Mwanza, Tanzania

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Background: Increased antimicrobial resistance (AMR) globally is associated with inappropriate antimicrobial consumption. However, there is limited data on Antimicrobial Consumption to establish stewardship programme in Tanzania. The aim of this study was to determine antibacterial consumption using WHO Anatomical, Therapeutic Chemical (ATC) and defined daily doses (DDD) methodology in Internal Medicine Wards of Bugando Medical centre (BMC).

Methods: A hospital based retrospective cross-sectional study that involved reviewing patients' medical records admitted in Internal Medicine wards of BMC from October 2019 to September 2020. Data were collected and analyzed in accordance with the WHO ATC/DDD methodology.

Results: There were 1992 patients' medical records reviewed. A total of 1342 (68.26%) patients were prescribed antibacterial,

predominantly of the Watch group. Only 2 of 1342 patients' medical records were prescribed antibacterial basing on culture and sensitivity test. Two thirds of the patients prescribed antibiotics had no infectious disease. The total antibacterial consumption was 86.40 DDD/100BD with ceftriaxone having the highest consumption. On AWaRe classification, Access group had 29.34 DDD/100BD, Watch group had 43.97 DDD/100BD and the Not Recommended group had 8.96 DDD/100BD. Antibacterial in the Not Recommended group were ampicillin/cloxacillin and ceftriaxone/sulbactam.

Conclusion: There was a high consumption of Watch antibiotics, Not Recommended antibiotics and an insignificant use of culture and sensitivity tests. Antimicrobial Stewardship programme at BMC needs to be implemented to control for rational prescription and use of culture and sensitivity tests.

Keywords: *Antibacterial consumption; DDD; Antimicrobial stewardship; AWaRe*

IDAR 17: Assessing Parental Choice of Lopinavir/Ritonavir Granules Intake to Improve Child Adherence at Baylor-Mwanza, Tanzania.

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Background: Drugs' formulations are one of the main obstacles to achieving viral suppression in children. In 2020, Tanzania Ministry of Health introduced Lopinavir/ritonavir (LPV/r) granules as one of the child friendly formulation. This formulation allows new and more attractive routes of administering medication to children > 3 years. During counselling, different options were advised: to mix granules with soft food, to blend with liquids such as water or milk, or to pour directly into the child's tongue. This study's objective was to assess administration practices, challenges, and acceptability among caregivers whose children are on LPV/r granules.

Methods: The study was conducted at Baylor Clinic - Mwanza, between September and October 2020. Caregivers whose children were on LPV/r granules for at least two weeks were sampled and interviewed. Data on administration practices, challenges encountered during administration and acceptability of LPV/r granules were collected.

Results: Out of the 72 caregivers interviewed, 52 (72%) and 44 (61%) were

aware of the three options to administer the dose and found the process of mixing granules prior easier, respectively. Offering the granules with water was the preferable route for 52(72%) caregivers. 50(69%) of caregivers who started by mixing granules with soft food had changed to water. At least 3 sachets per dose were prescribed for 68(94%) of the children, and 52(72%) of the caregivers administering it at once. Although 46(64%) have not claimed any problem while administering granules, 18(25%) described vomiting and 8(11%) complained of the number of sachets per dose. More than half of the caregivers 41(57%) preferred to continue with LPV/r granules as it was easy to administer.

Conclusion: Although the suggested first option was mixing with food, the preferred option of administering LPV/r granules was with water. Majority of the caregivers accepted the new administration route, vomiting and dose size being the biggest challenges observed.

Keywords: *Lopinavir/ritonavir; granules, formulations; acceptability; Sachets, caregiver*

IDAR18: Poor specificity but high sensitivity of Point-of-Care Circulating Antigen test in diagnosing *Schistosoma mansoni* in adult population on Ukerewe island, north-western Tanzania

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Background: Diagnosis of *Schistosoma mansoni* is traditionally conducted using a parasitological microscopy-based method, the Kato Katz technique. This technique has multiple limitations especially in population excreting low numbers of *S. mansoni* eggs such as adult due to development of immunity. The Point-of-Care Circulating Cathodic Antigen test is an alternative rapid diagnostic test which uses urine sample to diagnose *S. mansoni* infection. However, the variability in sensitivity and specificity of this tests observed in our previous studies, requires follow-up on its performance.

Methods: A cross sectional study was conducted in 15 villages of Ukerewe island to determine the prevalence of Schistosomiasis infection among adults. A single stool and urine sample was collected from a total of 2,958 adult participants (aged ≥ 15 years) and examined for *S. mansoni* infection using Kato Katz (KK) technique for presence of eggs and Point-of-Care Circulating

antigen (POC-CCA) test for presence of antigen.

Results: A total of 49.2% and 50.8% of the participants were female and male respectively. The overall prevalence of *S. mansoni* using KK technique and POC-CCA were 28.5% (26.9-30.1) and 84.8% (95%CI: 83.4-86.0). 32.2% of the participants diagnosed having *S. mansoni* infection by POC-CCA test were also positive on KK technique. 67.9% of the participants diagnosed having *S. mansoni* infection by POC-CCA were negative on KK technique. The overall sensitivity and specificity of POC-CCA test were 94.7% (95%CI: 93 – 96.1) and 19.3% (95%CI: 17.6 – 21). The Positive and Negative Predictive Values were 32.1% (95%CI: 30.2 – 34) and 90% (80.9 – 92.6).

Conclusion: Point-of-care circulating cathodic antigen test achieved high sensitivity but its specificity was below 50%. These findings call for the need to monitor the suitability of POC-CCA test in diagnosing *S. mansoni* infection.

Keywords: Point-of-Care Circulating Antigen test; *Schistosoma mansoni*; Adults; Tanzania

IDAR19: Test and Treat: An innovative approach to attract the adult population for mass drug administration against intestinal schistosomiasis on Ukerewe Island, north-western Tanzania

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Background: One of the challenges of mass drug administration against intestinal schistosomiasis using the drug praziquantel is the lack of a diagnostic component to confirm infection status before offering medication. It has been reported that the adult population is reluctant to take medication without diagnosis. The point-of-care Circulating Cathodic antigen test offers an opportunity to address this problem by diagnosing *S. mansoni* infection in a timely manner and offering treatment. Here, we report the results of the test and treat campaign, which was implemented among the adult population as part of the rapid assessment of the prevalence of intestinal schistosomiasis.

Methods: The cross-sectional study was conducted in 15 villages of Ukerewe district and included 3,528 adult individuals aged \geq 18 years. A single urine sample was collected from each participating individual and screened for *Schistosoma mansoni* infection. The results of the test were available within 20 minutes and infected

individuals were treated with praziquantel at the screening point.

Results: Of the participants, 42.9% and 57.1% were female and male respectively. The median age of participants was 39 (IQR: 28 – 50 years). The overall prevalence of *Schistosoma mansoni* was 79% (95%CI: 77.6 – 80.3), with no statistical difference between female and male participants (78.2% versus 79.6%, $P=0.3$). The age groups 18-30 years (89.3%) and 31-50 years (76.4%) had the highest prevalence ($\chi^2=130.5651$, $P=0.001$). A total of 2,698 participants received treatment during the campaign, of these, 41.5% and 58.5% were female and male respectively.

Conclusion: Intestinal schistosomiasis is a public health problem among the adult population of Ukerewe island. It is strongly recommended that this population will be included in the regular treatment programme by National Neglected Tropical Diseases Control Programme to reduce prevalence of the infection and its associated morbidities and mortalities.

Keywords: *Test and Treat; adult population; MDA; intestinal schistosomiasis; Tanzania*

IDAR20: Treatment coverage validation survey following mass drug administration for schistosomiasis indicate high participation rate among adult on Ukerewe island, north-western Tanzania

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Background: Mass drug administration (MDA) using praziquantel drug is a keystone for controlling schistosomiasis in Tanzania. The World Health Organization (WHO) recommends at least 75% coverage of treatment for the targeted population. Despite the fact that community drug records are trusted, it remains important to validate them through a coverage validation survey and identify gaps. This survey aimed at assessing the schistosomiasis post-MDA coverage on Ukerewe island.

Methods: A community-based cross-sectional coverage survey was conducted in 15 villages of Ukerewe island, which were involved in MDA. The survey questionnaire comprised of questions related to drug uptake, knowledge and source of information about MDA and swallowing drugs. A total of 50 households per village were selected for the survey.

Results: A total of 1,379 participants from 750 households participated in the survey. Of these, 39% and 61% were male and female respectively. The mean age of participants was 41.5 ± 17 years. Overall,

95% of the participants reported to have heard of the MDA campaign, with the source of information being hamlet leaders (63.2%) and the public speaker (50.7%). In general, 98.8% of the participants confirmed that MDA was implemented this year and 80.7% reported to have swallowed praziquantel drug. Reasons for those who reported not to have participated in MDA were Community Drug Distributors (CDD) did not reach their areas (50%), drugs were out of stock (12.4%), were pregnant (22.8%), absent during MDA (9.6%) and breastfeeding (3.6%).

Conclusion: The findings of the survey on uptake of treatment was similar to what was reported by community distributors. The treatment coverage was definitely higher than the cut off expected for a successful campaign acc. to WHO recommendations. Nevertheless, improving coverage beyond this should go hand-in-hand with addressing the observed gaps. This can significantly contribute to the schistosomiasis elimination.

Keywords: *Schistosoma mansoni*; mass drug administration; community drug distributors, validation

IDAR21: Prevalence and Associated Factors of Self-medication with Antimalarials among Undergraduates at Catholic University of Health and Allied Sciences-Bugando, Mwanza, Tanzania

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Background: Self-medication with antimalarials is commonly practiced worldwide, but mostly practiced in developing countries like Tanzania. It is a primary measure taken by majority of people for uncomplicated malaria. Young adults, especially medical students, are reported to be more prone to this practice. This study was conducted to determine the prevalence and associated factors of self-medication with antimalarials among undergraduates at CUHAS-Bugando, Mwanza, Tanzania.

Methods: The study was a descriptive cross-sectional study. Convenience sampling was used to select 350 consenting respondents. Semi-structured questionnaires were used to gather data concerning the prevalence and associated factors of self-medication with antimalarials among undergraduates. At 95% confidence interval, the P value of less than 0.05 was considered statistically significant.

Results: A total number of 350 respondents with the mean age 23 ± 2.8 years were involved in the study. The prevalence of self-medication with antimalarials was (56.3%). The main reason associated with self-medication practice was emergency of illness (40.9%). The most common antimalarial used for self-medication was ALU (61%) and the major source of the antimalarials used for self-medication was community pharmacies (75.4%).

Conclusion: The prevalence of self-medication with antimalarials among undergraduates at CUHAS-Bugando was high. The year and course of study were statistically significant associated with self-medication practice at 95% confidence interval. Second year (31%) and Doctor of medicine course (34%) students practiced self-medication more than other years and courses respectively.

Keywords: *Antimalarials; Self-medication; Practice; CUHAS-Bugando; Tanzania*

IDAR22: Co-infection of *Schistosoma mansoni*, Hepatitis viruses and HIV among adult population at Ukerewe district, north-western Tanzania: Prevalence and hepatosplenic morbidities

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Background: Infection with multiple aetiologies may lead to severe morbidities and high mortalities. HIV is thought to impair the development of immunological granulomas, which are important in protecting the development of *S. mansoni* related morbidities, while the hepatitis viruses may exacerbate the effects of *S. mansoni* infection in the liver. Here we report the occurrence of co-infection with *S. mansoni*, Hepatitis B and C and HIV and their associated hepatosplenic morbidities in the adult population of Ukerewe district, north-western Tanzania.

Methods: A total of 2,963 participants were ultrasonographically examined for hepatosplenic abnormalities. Individual urine and stool samples were collected and tested for *S. mansoni* infection using the Kato Katz technique and Point-of-Care Circulating Cathodic Antigen (POC-CCA) test. Hepatitis C and B surface antigens (HCVsAg and HBVsAg) were determined with a rapid test from a blood sample taken from the fingertip.

Results: The prevalence of *S. mansoni* infection based on KK technique and POC-

CCA test was 28.5% (95%CI: 26.9 – 30.1) and 84.7% (95%CI: 83.4-85.9). The overall prevalence of HCV, HIV and HBV were 0.5%, 2.3% and 5.2%. Based on KK technique, prevalence of co-infection of *S. mansoni*/HCV, *S. mansoni*/HIV and *S. mansoni*/HBV were 18.7%, 30.8% and 35.7%. Based on POC-CCA test, the prevalence of co-infection for *S. mansoni*/HIV, *S. mansoni*/HCV and *S. mansoni*/HBV were 75%, 84.4% and 92.6%. The overall prevalence of peri portal fibrosis (PPF) was 50.7% (95%CI: 48.7 – 52.6), with male individuals having the highest prevalence (59.4% versus 40.6%, $P=0.001$). The prevalence of hepatomegaly, splenomegaly and hepatosplenomegaly were 62.7%, 57% and 72%.

Conclusion: In this setting, hepatosplenic morbidities associated with *S. mansoni* and hepatitis infection are common among the adult population. These findings highlight the need for integrated interventions to control and fight against parasitic and viral diseases.

Keywords: *Schistosoma mansoni*; Hepatitis; HIV; Adults; Morbidity; Tanzania

IDAR23: Phenotypic and Molecular Detection of Extended Spectrum Beta Lactamase Producing *E. coli* from Human, Animals and Environment using one-health approach in Tanzania.

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Background: Antibiotic resistance associated with Extended Spectrum Beta Lactamase (ESBL) producing isolates challenges health systems. The dissemination of the ESBL producing *E.coli* poses a problem when infectious disease like urinary tract infection (UTI) is involved, since it is described as the highest ESBL producing strain. Understanding resistance patterns to non-beta lactam antibiotics, allele's distribution and conjugation efficiency of ESBL producing *E.coli* will support treatment guidelines, infection and prevention control measures and monitoring of UTI.

Methods: A total of 472 archived ESBL *E.coli* isolate were analysed. Antimicrobial susceptibility to non-beta lactam antibiotics, Multi-plex PCR for SHV, TEM and CTX-M alleles, single-plex PCR for transconjugants (CTX-M) and Conjugative efficiency using *E. coli* J53 (Az^r plasmid free) as recipient.

Results: The resistance were highest for ciprofloxacin among urine 69/75 (92%) and gastrointestinal tract 171/200 (85.5%) isolates, followed by gentamicin among

urine 42/75 (56.0%) and gastrointestinal tract (GIT) 73/200 (36.5%) isolates. The CTX-M gene was the commonest allele detected 415/472 (87.9%), followed by the combination of CTX-M and TEM 193/472 (40.9%). The conjugation efficiency in this study was 74% (37/50), of which 100% conjugation was observed among environmental isolates. Resistance pattern and ESBL allele similarity observed in isolates from urine and GIT, likewise from urine and environment isolates.

Conclusion: About half of the isolates from urine and environment were resistant to ciprofloxacin and gentamicin. Almost all isolates carry CTX-M, TEM and SHV with most common alleles being CTX-M and CTX-M + TEM. The highest transfer efficiency observed among environment isolates. This waranting exploring the mobile genetic elements circulating in the environments. However the phenotypic pattern and ESBL allele similarity observed indicates sharing of resistance genes which circulates between human and animals

Key words: Donors, Recipient; Extended spectrum beta lactamase; Transconjugants; Conjugation efficiency

IDAR24: 'Dispensing or Selling? Dispensing Practices in Relation to Antimicrobial Resistance in human drugs outlets in Tanzania: A Qualitative Study'

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Background: Antimicrobial Resistance (AMR) is a global health threat projected to cause 10 million excess deaths by 2050. Dispensing antimicrobials without prescription is the most common practice in low-and middle-income countries (LMICs) including Tanzania, posing a threat of continued antimicrobial resistance (AMR). In this study, we aimed at exploring dispensing practices and the motives behind such practices in human drugs outlets in Tanzania.

Methods: A qualitative study was conducted under the auspices of Holistic Approach to Unravel Antibacterial Resistance in East Africa (HATUA Consortium) between 2019 and 2020 in 28 drug outlets (12 community pharmacies and 16 Accredited Drugs Dispensing Outlets-ADDOs) in Mwanza, Kilimanjaro and Mbeya regions of Tanzania. In-depth interviews were conducted with 28 dispensers in *Kiswahili*, audiotaped, transcribed verbatim, and translated in English. Transcripts were coded and analyzed thematically with the help of NVivo version 12 qualitative software.

Results: The study revealed that majority of dispensers were employees with work experience ranging from 1-20 years of service. Despite being experienced and knowledgeable in their field, dispensers confessed to sell antibiotics without prescriptions, selling incomplete course of antibiotics and selling antibiotics without giving adequate instructions to customers on how to use. These common practices among the dispensers in the drug outlets were motivated by a number of factors including sympathy and economic gains. Other findings under the broad themes of customers' pressure, business orientation and poverty status are presented and discussed.

Conclusion: To curb AMR, there should be a serious enforcement of laws and regulations governing antimicrobial provision and use. More importantly, implementation of antimicrobial stewardship interventions should be strengthened and scaled-up through proper advocacy and public awareness campaigns to all policy actors and stakeholders.

Keywords: *Antimicrobial resistance, dispensing practices, selling, Tanzania.*

IDAR25: HIV Prevalence Trends among Adolescents and Youth in Tanzania

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Background: HIV/AIDS prevalence has been increasing among general population since its occurrence but started to decline from 2010 worldwide. According to United Nations (UN) report in 2015, while globally major advances have been made in almost every area of the response to the HIV pandemic, UNAIDS cautions that there has been unequal progress in reducing new HIV infections, increasing access to treatment, and ending AIDS-related deaths, with many vulnerable people like adolescents and youth left behind. For instance, by 2015, just only 25% children and adolescents under the age of 15 who had HIV infection had access to life-saving treatment. This paper reports the HIV/AIDS prevalence among adolescents and youth in Tanzania since 2004 to 2020. Currently, there is limited studies on HIV prevalence focusing on this age group in Tanzania.

Methods: Information reported in this paper was collected through literature reviews of different reports and surveys in Tanzania then descriptive analysis was done.

Results: It has been noted that in Tanzania, HIV infection among adolescents was 1% by 2007/8 and 2011/12, while it was 0.7% in 2016/2017 respectively. Similarly, HIV prevalence among youth declined from 4.3% to 3.2 then to 2.2 in 2007/08, 2011/12 and 2016/17 respectively.

Conclusion: The overall HIV prevalence trend shown to be decreasing although a decrease in HIV prevalence among adolescents is at slower rate than among youth. However, the HIV prevalence is lower among adolescents as compared to HIV prevalence among youth. The prevalence of HIV is less than 2% among 15-19 years for both males and females and then increases with age for both sexes.

Keywords: *HIV prevalence trends; Adolescents; Youth, Tanzania*

IDAR26: Non- Prescription antibiotics dispensing practices for patients with chronic urinary tract infection in community pharmacies and accredited drug dispensing outlets in Tanzania: A simulated Clients Approach

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Background: Antibiotics dispensing without prescription is a major driver of Antimicrobial Resistance (AMR) and impacts on population health and cost of healthcare. This study aimed at determining dispensing practices focusing on clients' gender and level of outlets, the quality of advices, and antibiotics provided to client who presented with chronic UTI like symptoms.

Methods: A total of 672 Accredited Drug Dispensing Outlets (ADDOs) and community pharmacies were visited by mystery clients (MCs) in three regions of Tanzania namely Kilimanjaro (180, 26.79%), Mbeya (169, 25.15%) and Mwanza (323, 48.07%) in March and April 2020. Data were collected were entered in pre-designed epicollect5 software tool before analysis using Stata version 13.

Results: 89.43% (CI: 86.87%-91.55%) of drug sellers suggested antibiotics to MCs. Female MCs were more likely to be asked if they are taking other medications (27.2% vs 9.8%), had seen a doctor (27.8% vs 14.7%), and advised to

consult a doctor (21.6% vs 9.0%) than their counterparts. Ciprofloxacin (40.9%) and doxycycline (20.0%) were commonly dispensed antibiotics. Ciprofloxacin was sold to both female and male clients in both ADDOS and community pharmacies while doxycycline was dispensed more to females than males (25.5% vs 17.9%) and more by ADDOS than pharmacies (21.4% v 8.1%). Only doxycycline, amoxicillin, and Trimethoprim/Sulfamethoxazole are allowed antimicrobials to be sold at ADDOs. Almost a half of MCs who visited ADDOs and one third who visited community pharmacies were sold antibiotics not recommended for UTI treatment.

Conclusion: These findings calls for urgent action on regulation and legislative enforcement of prescribed only antibiotics and on-job training for drug sellers to adhere to guidelines on types of drugs they should sell for what diseases.

Keywords: *Antibiotic; Antibiotic Resistance; Dispensing*

IDAR27: Prescription Practices of Antifungal Agents at the Gynecology and Oncology Departments of a tertiary hospital in Tanzania: The Need for Antifungal Stewardship Program in Low- and Middle-Income Countries

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Background: Antifungals irrational prescription results to inappropriate use of antifungals, leading to emergence of antifungal resistance. This study determined the prescription patterns of antifungal agents in gynecology and oncology departments at Bugando Medical Centre (BMC) in Mwanza, Tanzania.

Methods: This was a retrospective cross-sectional hospital-based study involving file of patients who attended gynecology and oncology department of BMC between January and December 2017. All files of patients with fungal infections were analyzed. Checklist was used to collect information such as clinical case, age, and name of antifungal, number of antifungals, dosage form, dose frequency, does administered, and microbiological diagnosis.

Results: A total of 1,070 files of patients who attended in gynecology and oncology departments in the year 2017 were retrieved, of which 860 (80.4%) were from gynecology. Out of 1070 files, 158(14.6%) had fungal infections, of which 116 (n=860,

13.48 %) and 40 (n=210, 19.1%) were from gynecology and oncology departments, respectively. The commonest fungal infection diagnosed in gynecology and oncology department was vaginal candidiasis 112(n=116, 96.5%) and oral candidiasis 33(n=40, 82.5%), respectively. Common antifungal prescribed were azoles (Clotrimazole 56.9% in gynecology and fluconazole 37.5% in oncology). The prevalence of irrational antifungal prescription in gynecology and oncology departments was 22.4% (26/116) and 20% (8/40), respectively.

Conclusion: About one in five antifungal prescription for vaginal candidiasis in gynecology and oral candidiasis in oncology are irrational. More emphasis on following of national standard treatment guidelines are important to reduce irrational prescriptions of antifungal agents. In addition, there is a need of surveillance of antifungal resistance for common drugs to generate data that will help in establishing antifungal stewardship program.

Keywords: *Antifungal prescribing; Gynaecology and oncology; Tanzania*

IDAR28: Proportion and distribution of HBsAg in routine blood samples received in hematology department laboratory at Bugando Medical Centre, Mwanza, Tanzania

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Background: Hepatitis B virus (HBV) is a viral pathogen affecting liver resulting to cirrhosis, hepatocellular carcinoma, and death. Contact with body fluid including blood from an infected individual is the main mode of transmission of HBV. Laboratory workers are at increased risk of HBV from blood samples, although HBV infection status of blood samples received in the majority of medical laboratory is not clearly known. This study was designed to determine proportion and distribution of HBsAg in routine blood samples received in hematology department at Central Pathology Laboratory (CPL) of the Bugando Medical Centre (BMC), Mwanza-Tanzania.

Methods: Analytical cross-sectional laboratory-based study was carried out among blood samples received in hematology department at BMC between

June and August 2021. A total of 450 samples were tested for HBsAg by using HBsAg Rapid test strip (Diagnostar, USA). Data were analyzed by using STATA version 13.

Results: The median [IQR] age in years of patients whose samples were analyzed was 35[21-55] years and most samples were from female patients 59.6% (268/450) and outpatients 69.1% (311/450). The majority of samples initial test was full blood picture 81.8% (368/450). About 4.4% (20/450) of blood samples in hematology department were positive for HBsAg and mostly from male patients (OR[95%CI], p value: 2.3[0.92-5.81], p=0.074).

Conclusion: The intermediate endemicity of HBsAg among blood samples received in hematology department at CPL at BMC alerts for adherence to minimum personnel protective gears mainly wearing of gloves.

Keywords: *Hepatitis B virus; liver cirrhosis; hepatocellular carcinoma; hematology; Tanzania*

IDAR29: Faecal contamination of freshly extracted sugarcane juices marketed in Nyamagana district, Mwanza Tanzania

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Background: Consumption of faecal contaminated foods and drinks is associated with gastroenteritis and diarrhoea diseases. We designed this study to determine the prevalence of faecal contamination of fresh extracted sugarcane juices (FESJs), and we examined the change in rates of faecal contamination of FESJs over a period of 5 days after providing education on hygiene and sanitation among vendors selling FESJs at Nyamagana district in Mwanza, Tanzania.

Methods: This longitudinal study was conducted among 24 vendors of FESJs in July 2021. Pre-tested structured questionnaire and checklist were used for data collection. From 24 vendors, 120 sugarcane juice samples were collected in a period of 5 days in sterile specimen containers and transported to CUHAS Microbiology laboratory in cool box for processing. Samples were processed for total coliform counts, faecal indicator

organism, extended spectrum β -lactamase producing *E. coli* (ESBL-EC) and shiga-like toxin producing *E. coli* (STEC) by conventional bacteriological techniques. STATA version 13.0 was used for data analysis.

Results: The majority 96.7% (116/120) of FESJs had growth of coliforms of $\geq 10^5$ CFU/ml (62.9%, n=73). Out of 116 positive samples, faecal contaminant indicator *E. coli* was isolated from 71 (61.2%). None of the *E. coli* isolated was positive for STEC or ESBL-EC. Significantly, the overall faecal contamination of FESJs decreased from 87.5% (21/24) on day 1 to 45.8% (11/24) on day 5, p=0.007.

Conclusion: High proportion of FESJs marketed at Nyamagana District are contaminated with faecal indicator bacteria, *E. coli*. Provision of knowledge of hygiene and sanitation, significantly decreases the rate of faecal contamination of FESJs.

Keywords: *Escherichia coli; faecal contamination; faecal indicator organism; total coliforms count.*

IDAR30: The science behind traditional medicine practices in Sub-Saharan Africa. A Case Study of Coronavirus (COVID-19) Management in Tanzania

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Background: Coronavirus (COVID-19) represents a serious threat to public health across the world. The presentation of enveloped, +stranded RNA viruses with a crown-appearance has ranged from asymptomatic/Mild symptoms to severe illness and mortality. Tanzania has reported 509 cases and the virus has claimed the life of 21 patients. To fight COVID-19 in Tanzania, various measures were taken including social distance, putting mask, hand hygiene as well as traditional methods such as herbal remedy and steam inhalation administration.

Methods The literature retrieves that the flavonoids have potential inhibitory and immunomodulatory activities against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) designated as COVID-19 also has showed excellent anti-inflammatory activities including the inhibition of various inflammatory cytokines. Further, flavonoids showed significant ability to reduce the exacerbation of COVID-19 in the case of obesity through promoting lipids metabolism.

Results: In traditional medicine practices, COVID-19 infection was regarded as cold

related illness and Traditional Health Practitioners encouraged patients to take herbal remedy such as mixture of ginger, onion, cayenne pepper, garlic and lemon which can warm their body and remove dampness in the lungs alternatively they administered steam inhalation from plants such as *Ocimum Suave*, Lemon grass and Eucalyptus leaves. All these methods relieved symptoms of COVID-19 and prevented further deterioration of the COVID-19 patients. 14 samples of herbal remedy were taken for chemical (phytochemical) analysis. The analysis results were as follows Flavonoids (87.5%), Saponins (35.7%), Alkaloids (35.7%), Capsians (14.2%), Steroids (7.1%), Eucalyptol (7.1%) and Anthraquinones (7.1%)

Conclusion: There is gap in translating the traditional medicines practices and knowledge into conventional practices due to inadequate information regarding phytochemical perspective of the medicinal plants used by Traditional health practitioners in Tanzania and Africa.

Keywords: Traditional; Medicine; COVID-19; Flavonoids; Practice

IDAR31: Molecular characterization of Coagulase-negative Staphylococci spp. causing Urinary Tract Infection in Tanzania - A cross-sectional laboratory-based study.

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Background: Urinary tract infections is mainly caused by *Escherichia coli*, but there is a growing body of evidence on potential involvement of Coagulase-negative *Staphylococci spp* (CoNS). in causing UTI. The aim of this study was to determine molecular characterization of Coagulase-negative *Staphylococci spp* causing Urinary Tract Infections in Tanzania.

Methods: This cross-sectional laboratory-based study was conducted from February 2021 to August 2021. Coagulase-negative *Staphylococci spp*. from patients who were clinically and microbiologically confirmed to have UTIs were retrieved, sub-cultured and whole genome sequenced. The assembled sequences were analyzed to identify; Species and STs of the Coagulase-negative *Staphylococci*, using Pathogenwatch platform (<https://pathogen.watch/>), whereas Virulence and Antimicrobial resistance genes, using tools found in Galaxy | Europe Bioinformatics platform (<https://usegalaxy.eu/>).

Results: From 65 sequenced isolates, 8 species were identified with the predominance of 27 (41.5%) *Staphylococcus haemolyticus*, and 24 (36.9%) *Staphylococcus epidermidis*. The majority of *Staphylococcus haemolyticus*, were assigned to ST30, while *Staphylococcus epidermidis* assigned to ST490. Total of 60 (92.3%) isolates had either one or multiple antimicrobial resistance genes. Of 248 antimicrobial resistance genes identified, with the predominance of *dfrG* 53 (21.4%) and *blaZ* 32 (12.9%) and *mecA* 26 (10.5%). The prevalent identified virulence genes that may be implicated in UTI pathogenesis were *icaC* 47 (46.5%) and *icaA* 14 (13.9%).

Conclusion: *Staphylococcus haemolyticus*, and *Staphylococcus epidermidis* harboring *icaC*, virulence genes and *dfrG*, *blaZ* and *mecA* antimicrobial resistance genes are the most predominant among CoNS causing UTI in the study area. Further studies to explore the treatment outcome of patients with UTI due CoNS species is recommended.

Keywords: Coagulase Negative *Staphylococci spp*; Whole Genome Sequencing; Virulence genes; Antimicrobial resistance genes; Sequence types

IDAR32: Seroprevalence of Brucella Antibodies among Women with Unfavourable Foetal Outcomes in Mwanza, Tanzania

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Background: Brucellosis remains a public health problem worldwide, the existing knowledge on whether brucellosis causes spontaneous abortions than other infections still remains controversial, the fact that Brucella has been recovered from products of conception with evidence of inflammation suggests greater possibilities of it being involved with recurrent pregnancy losses. This necessitate the need to generate information regarding the magnitude of Brucella antibodies among women with unfavorable fetal outcomes.

Methods: A laboratory based cross sectional study conducted in Mwanza region in July 2020 by using 185 archived sera collected from women with unfavorable fetal outcomes from three health facilities in Mwanza region. Sera were tested for *Brucella abortus* and *B. melitensis* antibodies by using slide

agglutination test (SAT). Data was analyzed by using SPSS version 20.

Results: The mean age of women in this study was 29.1±6.4 years while the mean gravidity was 4± 2 pregnancies. More than three quarters of women 181 (97.84%) with unfavorable fetal outcomes reported history of pregnancy loss, with more than half 108(58.38%) reporting stillbirth. The seroprevalence of Brucella antibodies among women with unfavorable fetal outcomes was found to be 30(16.22%:95% CI: 10.8-21.5). None of the factors was found to be associated with *Brucella* spp seropositivity.

Conclusion: The seroprevalence of Brucella antibodies is high among women with unfavorable fetal outcomes in Mwanza, which calls for the need to include screening of *Brucella* during antenatal visits in endemic areas.

Keywords: *Unfavorable fetal outcomes, Brucella spp.; Tanzania*

IDAR33: Seroprevalence and Associated Factors of Brucella Antibodies among Blood Donors in Mwanza Region

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Background: Brucellosis is one of the common neglected zoonotic infection that affect human, livestock and wildlife. Although it is endemic in most developing countries Brucellosis remains under-diagnosed and under-reported. In Tanzania there is a scarcity of information on the status of the disease among blood donors thus no screening process is implemented on the blood products for Brucella antibodies before transfusion. This study investigated the magnitude of Brucella antibodies among blood donors in Mwanza, Tanzania

Methods: Analytical cross section study involving 196 blood donors in different blood donation centers in Mwanza Region was conducted between June to July, 2021. Structured questionnaire was used to collect participant's information. Blood sample was collected and sera were used for detection of Brucella antibodies by slide agglutination test. Data were analyzed by using a STATA version 13.

Results: The median age of enrolled participants was 20.5 [IQR: 18-33] years. The overall seroprevalence of Brucella antibodies was found to be 23/196(11.7%) [95% CI: 7-16] among blood donors in Mwanza city. Seroprevalence of *B. abortus* was 20/196(10.20%) [95% CI: 6-14] while that of *B. melitensis* was 17/196(8.67%) [95% CI: 5-13]. Being a female (OR: 0.3, 95% CI: 0.13-0.74, P=0.009) protected individuals from being seropositive. Moreover, having a child (OR: 2.86, 95% CI: 1.18-6.94, P= 0.02) and being married (OR: 2.94, 95% CI: 1.21-7.14, p=0.017) were significantly associated with Brucella seropositivity.

Conclusion: A significant proportion of blood donors in Mwanza are Brucella antibodies seropositive and is predicted by being male, being married and having child. Further studies with large sample size to identify active cases are warranted in Mwanza.

Keywords: *Brucella spp; Mwanza; Blood donors*

IDAR34: Seroprevalence and Associated Factors of *Toxoplasma gondii* antibodies among Chicken and Pigs reared in Mwanza Region

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Background: *Toxoplasma gondii* is a zoonotic parasite capable of infecting warm-blooded mammals including humans. The seroprevalence in pigs is estimated to be 19% globally while in chicken there is limited data on its epidemiology globally. Different studies have shown that consuming raw or undercooked meat plays an important role in epidemiology of toxoplasmosis. However, the role of pork and chicken in the epidemiology of toxoplasmosis in Tanzania remain to have limited information despite that these are common source of protein consumed by large population in different areas in Tanzania. This study investigated the magnitude of *T.gondii* among pigs and chicken reared in Mwanza Tanzania.

Methods: A cross sectional study using achieved sera (91 from pigs and 91 chicken) collected from animals reared in Mwanza was conducted from July to August 2021. Detection of *Toxoplasma gondii* antibodies was done using indirect enzyme linked

immunosorbent assay (ELISA). Data was analyzed using STATA version 13 software.

Results Three breeds of pigs were included in this study namely landrace, large white and saddleback. The median age of the pigs enrolled was 36(32 - 40) weeks and the median number of pigs in the sampled cages was 63(59 – 85) pigs while the sera from chicken were all from local chickens with mean age of 48 weeks. The seroprevalence of *Toxoplasma gondii* IgG antibodies was found to be 23.07% (21/91) [95% CI: 15.4 – 33.03] in pigs while only one serum (1.09%) was positive for *T.gondii* IgG antibodies. None of the factors was found to be associated with *Toxoplasma gondii* IgG seropositivity among animal sera.

Conclusion- A significant proportion of pigs reared in Mwanza are *Toxoplasma gondii* IgG seropositive. None of the factors was found to be associated with *Toxoplasma gondii* IgG seropositivity among pigs reared in Mwanza city. This calls for the need to emphasize on preventive measures.

Keywords: *Toxoplasma gondii*, Mwanza, Chicken, Pigs; Tanzania

IDAR35: High Proportion of Multi drug resistant Gram-Negative Bacteria Colonizing Gastrointestinal Tract in HIV and Non-HIV Infected Children; a Call for strengthening infection and prevention measures in LMIC

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Background: Colonization of multidrug resistant (MDR) bacteria has been found to be associated with subsequent invasive infections in children with comorbidities. We investigated the burden and factors associated with nasal, oral and rectal colonization of multidrug resistant pathogens among HIV and HIV non-infected children below five years of age in the Northwestern Tanzania.

Methods: A cross sectional study involving 399 children below five years of age was conducted between April and December 2020. Demographic and clinical data were collected followed by nasal, oral and rectal swabs to screen the presence of multi-drug resistant pathogens. Descriptive analysis was done using STATA version 15 software.

Results: The median [IQR] age of children was 19 [10 – 36] months. About a third 140(35%) were HIV infected. Out of 27 *Staphylococcus aureus* colonizing the nasal cavity, 16(59.5%) were methicillin resistant *Staphylococcus aureus* while 132/278 (47.2%) of Enterobacteriaceae bacteria colonizing

GIT were resistant to third generation cephalosporins with 69.7% (92/132) exhibiting ESBL phenotypes. The proportion of resistance to meropenem ($p<0.001$), amoxicillin/clavulanic acid ($p=0.002$) and gentamicin ($p<0.001$) were significantly more in the GIT isolates from HIV infected than no-HIV infected children. History of antibiotic use in the last month (OR 2.93, 95%CI:1.36-6.28, $p=0.006$) and history of a relative admitted from same household (OR 3.96 95%CI 1.11-14.09, $p=0.03$) independently predicted ESBL rectal colonization among children below five years of age.

Conclusion: Children below five years of age with history of antibiotic use and relative hospital admission were significantly more colonized with ESBL-PE, with no significant differences between HIV and non-HIV infected children. There is a need to strengthen antimicrobial stewardship and IPC programmes to prevent spread and emergence of MDR pathogens.

Key word: Children, Colonization, Human Immunodeficiency Virus and Resistance

SUB-THEME: HEALTH SERVICE DELIVERY AND PATIENT CARE (HSDPC)



HSDPC01: High participation of the adult population in community-based mass drug administration against intestinal schistosomiasis at Ukerewe Island, North-western Tanzania

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Background: Mass drug administration (MDA) using praziquantel (PZQ) is a cornerstone for schistosomiasis in Tanzania, however, this intervention does not include adults. From a public health and successful disease control perspective, schistosomiasis interventions should benefit and reach all individuals at risk. Understanding that, the Else Kröner Centre for advanced medical studies supports covering the gap through a holistic set of community-based interventions, including MDA for adults. Here, we report the findings of the first round of community-based MDA.

Methods: Population census was conducted in 15 villages of Ukerewe Island with the aim of registering eligible individuals (≥ 15 years). Community drug distributors (CDD) were trained on various aspects of schistosomiasis, how to conduct community-based MDA, administer drug using PZQ pole, information about possible side effects related to treatment, and how to advice in case of severe side effects. The CDDs kept records of the implemented MDA

activities and treatment uptake data from the CDD books were analysed.

Results: A total of 38,009 adult individuals were registered for the community-based MDA, 49.3% and 50.7% were female and male respectively. The median age was 35 years (IQR: 24 – 48 years). Of these, 80.9% (30,748/38,009) (48% and 51.9%, female and male) participated in the community-based MDA. The main reasons for non-participation were i) absence during the treatment exercise, ii) being pregnant, iii) fear of side effects, iv) treated during school-based MDA, or v) being sick or unfit for treatment

Conclusion: The participation of the adult population from the targeted villages was very high and above the WHO recommendation of 75%. In order to eliminate schistosomiasis, there is a need to continue sensitizing adult population and other sectors about the disease and the benefits of MDA and make this treatment option available and accessible for all population at risk.

Keywords: *Schistosomiasis; MDA; Adult; Participation; Tanzania*

HSDPC2: Causes of surgical acute abdomen in adults at St. Francis Hospital: A semi-urban hospital at Kilombero, Tanzania.

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Background: Acute abdomen (AA) is a non-traumatic abdominal pain contributing approximately 1% of total hospital admission worldwide, normally treated surgically. A common surgical emergency with significant challenges to the surgeons especially for unexpected in the limited diagnostic facilities. The causes of surgical AA differ from one area to another. In Africa, the commonest cause of surgical AA is an acute appendicitis ranging between 30-50%. In experienced hand, it is a bedside diagnosis, however, in the limited diagnostic facilities, it may be difficult to have a proper diagnosis hence plan for management, and this may lead to false or delayed diagnosis and treatment as well. In Tanzania, few data and study on AA are available.

Methods: A retrospective cross-sectional study was conducted using medical records at St. Francis Referral Hospital (SFRH) from October 2017 to October 1,

2019. The data were analyzed by using SPSS version 20.0 statistical package.

Results: Out of 284 patients, males were 65.14% and females were 34.86% with M: F of 1.9:1. The age ranged from 13 to 85, and the most prominent age group was 30–39 (19.7%). Peritonitis was the main cause AA with 31.34% followed by intestinal obstruction due to sigmoid volvulus 25.0%. Perforated peptic ulcer disease was leading cause of peritonitis with 23.94%. Out of the surgically treated patients 14.03% developed postoperative complications other than deaths. The commonest complication was wound infection 5.63%. The overall mortality rate was 12.68%.

Conclusion: The cause of AA in our area is perforated PUD, which give a room to the clinicians and researchers to investigate the risk factor for the high prevalence of perforated PUD.

Keywords: *Acute abdomen; Significant challenges; surgical emergency*

HSDPC3: Delivering cancer care in rural Tanzania

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Background: Good Samaritan Cancer Hospital (GSCH) is a non-profit, private hospital in Ifakara, Morogoro, Tanzania, providing, since February 2020, cancer care from investigations to treatment of pre-malignant and malignant cases. GSCH is the first rural cancer hospital in Tanzania, providing modern radiotherapy treatment using 3D-Conformal Radiotherapy (3D-CRT) and Intensity Modulated Radiotherapy (IMRT) with the Halcyon LINAC machine, first one in rural Tanzania and third in Africa. 3D Brachytherapy for cervical cancer treatment is also provided, a first in Tanzania.

Methods: Upon understanding the state of public health knowledge, teams from GSCH Rural Outreach Programs (ROP) conducted cancer awareness and free cancer screening camps across the Kilombero District between November 2020 and July 2021. Cervical cancer screening was performed using Visual inspection with Acetic Acid (VIA) and

Visual Inspection with Lugol's Iodine (VILI). Breast cancer screening was performed for women and prostate cancer testing (PSA) for males, as per screening protocols.

Results: GSCH teams screened 850 adults in four camps. The observation was that 21.6% of women had suspected pre-malignant cervical lesions, 2.1% of women had breast lumps that were suspected to be malignant, and 12.9% of men were suspected with prostate cancer. During Q2 2021, most prevalent malignancies at GSCH were cervical, breast and prostate cancer, accounting for 67% of all malignancies.

Conclusion: Considering these results, there is a need to increase free rural cancer education and screening. GSCH priority is to serve rural communities through early detection of cancerous lesions and treatment. GSCH focuses on social and national health objectives, aims to grow and modernize cancer care in rural Tanzania.

Keywords: *Breast; cervical; prostate cancer; rural Tanzania; Good Samaritan Cancer Hospital; Ifakara*

HSDPC4: Histopathological Evaluation of The Microtomy Artifact on Hematoxylin and Eosin Section at Bugando Medical Centre, Mwanza, Tanzania

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Background: An artifact is observed in a scientific investigation or experiment as result of the preparation or investigative procedures. The aim of this study was to evaluate the type and prevalence of microtomy artifacts found in histopathological tissue sections slides at Bugando Medical Centre.

Methods: This was a cross-sectional study. 547 consecutive hematoxylin and eosin (H&E) stained sections slides were retrieved from the archives of the histopathology laboratory at Bugando Medical Centre and analysed for artifacts under a light microscope.

Results: Of the 547 histopathological slides retrieved for the study, 412 (75.3%) presented microtomy artifacts while the remaining 135 (24.7%) had no microtomy artifacts. Of the 412 slides with microtomy artifacts, 204 (49.5%) slides had only one

type of microtomy artifacts while the remaining 208 (50.5%) slides had more than one type of microtomy artifacts. Out of the overall 672 microtomy artifacts, 576 (85.7%) were due to section cutting, 4 (0.6%) were due to floatation while the remaining 92 (13.69%) were due to trimming. The folding artifact was the most prevalent constituting 300 (54.8%) and thick section 2 (0.4%) was the least common.

Conclusion: The high prevalence of microtomy artifacts at Bugando Medical Centre reflects the burden of misdiagnosis in our setting. Section folding artifacts were the most prevalent pattern of artifact observed in this study. Proper technical measures need to be employed in order to prevent or minimize the occurrence of artifacts in a skilful manner, as they may pose diagnostic difficulties.

Keywords: *Histopathology; Microtomy; Artifacts*

SUB-THEME: MEDICAL EDUCATION AND TRAINING (MET)



MET01: Assessment of entrepreneurial traits and intention among undergraduate students at Catholic University of Health and Allied sciences -Mwanza, Tanzania

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Background: Entrepreneurship of young graduate is fundamental in mitigating unemployment problem and the role of universities is very important in developing an entrepreneurial behavior. The present study aimed at assessing entrepreneurial traits and intention among undergraduate students at Catholic University of Health and Allied sciences (CUHAS) -Mwanza, Tanzania.

Methods: A cross-sectional descriptive study was conducted in May 2021 at CUHAS. Three hundred and thirty-one (331) undergraduates were selected by stratified random sampling. Pre-tested semi-structured questionnaire was used to collect primary data. The level of entrepreneurial traits was measured on a five-point Likert-type scale with alternative responses of very low (1), low (2), moderate (3), high (4) and very high (5). Entrepreneurial intention was measured using don't know/yes/no responses. Data were fed into Microsoft excel and then exported to STATA version 13.

Results: The level of entrepreneurial traits of the students was moderate with an

overall mean of 3.6. The majority (285, 86.1%) of students thought themselves capable of opening and bring a business to success, reflecting a positive feasibility, and perceived themselves as people who willingly act on their individual decisions. The major motivating factor for entrepreneurial intention indicated by the respondents was "preference for personal creativity" (295, 89.1%). However, the major perceived barrier to starting their own business was "lack of fund to start" (268, 90%).

Conclusion: This study showed that there was an overall moderate level of entrepreneurial traits among the undergraduate students. The findings have shown that there is high intention and that students are interested to become entrepreneurs. Students are motivated by factors such as preference for personal creativity, desire for independence and being their own bosses. However, main barriers reported in this study were lack of fund to start a business and uncertainty in financial returns.

Keywords: *Entrepreneurship; Traits; Intention; Undergraduate Students*

SUB-THEME: HEALTH SYSTEMS AND PUBLIC HEALTH (HSPH)



HSPS1: Low Uptake of Covid19 Vaccine among Healthcare Professional in Mwanza Region: A Call for Action

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Background: The availability of COVID19 vaccine through COVAX initiative program does not guarantee its uptake because of resistance and hesitancy in the population. Vaccine hesitancy is becoming a public health threat in curbing covid19 pandemic in low- and middle- income countries including Tanzania. Healthcare professionals are the key population for advocacy and promotion of the vaccine. In this study, we determined the COVID19 vaccine acceptance spectrum and barriers to its uptake among healthcare professionals from selected health facilities in Mwanza Region.

Methods: A cross-sectional study was conducted in September 2021 involving a convenient sample of 811 healthcare professionals from 26 health facilities in Mwanza Region. The study invited healthcare professionals from Magu, Misungwi, Ukerewe, Ilemela, and Nyamagana districts. The WHO vaccine acceptance questionnaire was adopted and utilized with minor changes. Data analysis was done using STATA version 13.

Results: Only 19% of the 811 health professionals had received covid19 vaccine in the selected health facilities. Less than one third (232, 29%) of the participants accepted fully the COVID19 vaccine, whereas two third of participants were in hesitancy stage. However, we cannot ignore the possible influence of 8% healthcare professionals who reported to definitely not take covid19 vaccine. Lack of communication and reliable information on safety, efficacy, side effects, and misconception on the signing of a consent form were reported as hindering factors to the uptake of covid19 vaccine.

Conclusion: Few healthcare professionals received covid19 vaccine in Mwanza region with the majority being in hesitancy stage. Engagement and involvement of trusted public health figures and opinion leaders through transparent dialogue to clarify safety, quality, and efficacy of the covid19 vaccine are recommended to improve the uptake among healthcare professionals with a goal of influencing the entire population.

Keywords: Covid19 acceptance; covid19 vaccine; healthcare professionals; Tanzania

HSPS2: Prevalence of Aflatoxin and Associated Factors among Maize Cereals in Mwanza, Tanzania

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Background: Aflatoxins are a family of fungal toxins produced by toxigenic fungal species such as *Aspergillus flavus* and *Aspergillus parasiticus*. Aflatoxins are carcinogenic and can lead to growth retardation and ultimately death among in children and animals. Aflatoxins contamination of maize is reported to have increased in East Africa but its magnitude remains mostly unknown. This study aimed to determine the prevalence of aflatoxins and associated factors in maize from selected markets in Mwanza, Tanzania.

Methods: A cross-sectional study involving 90 maize samples and maize merchants was conducted between June and July 2021 in Mwanza Tanzania. Data

were collected using pre- tested questionnaire. Maize samples were quantified using a competitive ELISA kit. Data was analyzed using STATA version 13.

Results: The prevalence of aflatoxin was 52.2% with a mean (SD) aflatoxin concentration of 1.35 (5.66ppb). The use of inappropriate storage bags (p=0.001) and spraying pesticides (p=0.001) were associated with aflatoxin contamination in maize.

Conclusion: The prevalence of aflatoxin in maize is high. Interventions to mitigate contamination must involve all farming stages. Farmers should use recommended pesticides at appropriate doses when storing cereals.

Keywords: *Aflatoxi; Aspergillus flavus; Aspergillus parasiticus*

HSPS3: Quality of Household Drinking Water at Ijinga Island in Mwanza Tanzania

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Background: Poor quality of household drinking water is mainly caused by improper treatment or poor storage at household level. This study aimed to determine the prevalence of microbial contamination and associated risk factors from household drinking water and water sources at Ijinga Island in Mwanza, Tanzania.

Methods: A cross-sectional study, involving 401 household drinking water sample and water sources at Ijinga Island Mwanza, was conducted between June and August 2021. A structured questionnaire was used to collect demographic data from household representatives. LETZ TEST TUBE system was used to detect microbial contamination. Data was analysed using STATA version 13.

Results: The prevalence of microbial contamination was 90.3% (362/401) and

100% (401/401) for household drinking water and water sources respectively, with *Pseudomonas Aeruginosa* as the major isolated species. The median (IQR) age of persons responsible of preparing drinking water was 34[24.5-45.0] years. The majority of participants were females 79.7% (306/384) and most had no knowledge on water quality 95.31% (366/384). Having poor knowledge on water-borne diseases 1.19[1.01-1.51], $p=0.043$ and using unprotected water sources 1.19[1.03-4.82], $p=0.042$ were significantly associated with faecal-coliforms contamination.

Conclusion: Community education on diseases associated with microbial contamination and on treatment of water from the sources is highly recommended, especially in rural areas

Keywords: *Faecal coliforms; water-borne diseases.*

HSPS4: Incorrectly Use and Poor Handling of Face Mask among Patients' Relatives Visiting at Bugando Medical Centre, Mwanza, Tanzania: A Need for Health Education

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Background: During the Covid19 pandemic, non-pharmacological preventive measures were considered, including face mask wearing. Medical masks and well-designed cloth face masks provide protection if used and handled correctly. The risk of transmission and contamination increases with incorrect use of the face mask, especially in the hospital settings. In this study, we investigated the use of the face mask, handling and decontamination among patients' relatives at Bugando Medical Centre.

Methods: A cross-sectional study was conducted in September 2021 involving a convenient sample of 1052 patients' relatives at Bugando Medical Centre. The study invited participants during their hospital visits either escorting outpatients or bringing food for inpatients. We used a structured questionnaire and checklist during data collection. Data analysis was done using STATA version 13.

Results: In this study, majority of participants were female, currently married,

with secondary or tertiary education level. Around 86% had their face mask on, while the rest were holding it. Correct use of the face mask was observed among 32% of participants; others worn it upside down, inside out, covering only mouth, or hanging it on the chin. More than three quarters had bought their face masks from the vendor along the roadside and worn them at the gate. Reuse of the face mask was reported by 84% participants with the commonest decontamination methods being water and soap. Participants who reported reusing face masks kept them in their wallets, handbags, pockets, or basket without disinfecting after hospital visitation.

Conclusions: Incorrect use of face masks was observed among patients' relatives attending Bugando Medical Centre. Reuse of face masks is common with poor handling practice after hospital visitation. Health education is needed to advocate for correct use and handling of face mask to avoid contamination and transmission of infections, including covid19 virus.

Keywords: Covid19 pandemic; face mask; mask handling; Tanzania

HSPS5: Food Rescue Programs to Families with Food-Insecurity in Baylor Mwanza-Tanzania: Program Study.

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Background: Baylor Food support program aims at helping families with food insecurities attending our clinic. It is specifically focused on empowering these families through provision of essential foods and life skills. Health care providers (HCW) and social workers identified and assessed the needs of the individual family before enrolment. Some families were enrolled for six months and some were supported once/twice. Education emphasized good adherence to medications, retention to care, entrepreneurship skills and starting a home garden. The programme is supported by Baylor staff and friends of Baylor.

Methods: This was a program review from July 2018 to October 2021. 315 eligible families were enrolled. Inclusion criteria was a family with a child with malnutrition, TB, HIV and with food insecurity. Data was obtained from National Nutrition Daily Attendance Book, Food Donation Database and Electronic Medical Record (EMR).

Results: Among 315 families, 248 families were supported once and had good

Keywords: *Food; Rescue; Malnutrition; Families; Insecurity*

progress under social worker unit, 67 families were enrolled for six months. 21 out of 67 (31.3%) children had severe acute malnutrition, 34 (50.7%) had moderate malnutrition, 12(17.9%) had normal nutritional status. After the program, 49 out of 67 (73.1%) children had improved nutrition status, 59 (88.1%) had good adherence and 62 (92.5%) were retained in care, 11 (16.4%) of the families started a home garden and 9 (13.4%) started a small-scale business. Six children (9%) had slow weight gain due to chronic conditions and other family continued to have an unstable economy.

Conclusion: The majority of children improved their health status; good adherence on medication and food support program also helped to reduce missed appointments and family economy was improved through small scale business and initiation of home garden. This program has clearly showed that food availability can improve treatment outcome of children living with HIV, TB and malnutrition.

HSPS6: Tuberculosis Preventive Treatment for Children and Adolescent at Baylor Clinic-Mwanza, Tanzania: A Process Evaluation

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Background: Tuberculosis Preventive Treatment (TPT) is implemented as an intervention to prevent TB in people living with HIV. Previous TPT duration was six months, repeated every two years. In April 2018, guidelines updated to recommend six months of therapy once. Thus, eligible clients must be TPT naïve or have received TPT before April 2018. Clients are identified and initiated on TPT during clinic visits. Baylor has 90% TPT initiation and 85% completion rate goals and 27% initiation rate. This abstract reports changes implemented to improve and barriers affecting TPT initiation and completion rate.

Methods: Healthcare workers identify and follow up eligible clients to be initiated on TPT. Prior to visits, eligible clients were identified and documented. Sticker reminders were stuck on the client's files to notify eligibility. Reasons for not initiating TPT were documented, and clients followed up until eligible. Initiation rate was calculated as the proportion of total number of clients

initiated on TPT against total number of eligible clients. Completion rate was calculated as the proportion of total number of clients initiated on TPT against the total number of clients completed.

Results: Total number of clients identified and initiated on TPT between September 2020 and February 2021 were 507 and 456 respectively (90% initiation rate). Initiation barriers were stock out of isoniazid (61/267) 23%, missed appointment (59/267) 22%, cough (49/267) 18%, poor adherence on antiretroviral therapy (ART) (43/267) 16%; the remaining (55/267) 21% had other reasons including side effects to Isoniazid. Completion rate between September and October 2020 was (264/286) 92%.

Conclusion: Healthcare workers engagement and collaboration enabled Baylor to reach the goal of TPT initiation of >90% of and >85% completion rate. Continued caregiver education will improve ART adherence and maintain scheduled visits.

Keywords: *Tuberculosis; TPT; Children; Isoniazid; Prevention*

HSPH7: Leprosy: A Stander-by Public Health Contender in the Hard-to-Reach Communities along the Eastern Zone of Tanzania

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Background: Leprosy is an infectious disease, causing disfiguring, score and nerve damage on the arms, legs and skin. The disease is associated with poverty, poor knowledge and poor access to health facilities to provide definitive diagnosis. In most cases, patients are reluctant to report the infection earlier because of the slowness of the infection progression. This study determined the prevalence of leprosy in Eastern Tanzania using hospital records.

Methods: A retrospective study was undertaken by analysing the patients' biodata at the Nazareth Leprosy Centre located in Ifakara, Tanzania. The analysis was to determine the association of the disease with age, sex, location, type of lesions presented, disease detection technique and the time for reporting to the

centre. Chi – square and t – test were used to determine the association of the factors with disease causation at *p-value* of 0.05.

Results: A total of 157 patients' data at NLC were analysed. Males were (68.2%) with a case presentation of 72.6%. Mlimba district had more people reporting to the centre (44.6%) compared to the other districts around. The diagnosis was mainly based on presented clinical signs (62.4%) without skin smear slit and only 37.6% were diagnosed using the slit skin test.

Conclusion: This study outlined a high prevalence of leprosy in the study area, which could be alleviated by early detection and the treatment of newly diagnosed cases as well as contact tracing of patients in low resource communities.

Keywords: *Nazareth Leprosy Centre; Leprosy; Ifakara, Tanzania*

HSPH8: Caregivers Perception of Paedriatic Lopinavir/Ritonavir Formulations for HIV Infected Children at Baylor Clinic, Mwanza-Tanzania.

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Background: In 2015 and 2017, Tanzania introduced Lopinavir/ritonavir (LPV/r)-based regimen as the first line regimen for children < 3 and < 15 years old respectively; tablet and solution were the only formulations available. LPV/r tablets were prescribed for children able to swallow tablets. As most children were unable to swallow tablets, granules were introduced in 2019. Over a span of 5 years, children have used different LPV/r formulations depending on age, weight, availability and ability to swallow tablets. The objective of this study was to assess caregivers' perception of the different formulations.

Methods: A cross-sectional study was conducted at Baylor Mwanza between September and October 2020. Participants were caregivers whose children were < 25kg and on LPV/r regimen for ≥ 2 weeks. Structured questionnaire was administered to obtain information on types of LPV/r formulations administered between 2015 and 2020, the reasons for change and caregivers' preference on the formulation.

Results: Of the 330 caregivers assessed, (56%) had children < 5 years old. Majority (52%) of caregivers had administered two, (34%) one and (14%) three of LPV/r formulations throughout their children therapy. Half (50%) of caregivers mentioned stock out as a reason that led to change of LPV/r formulation. Furthermore, (30%) and (20%) of caregivers cited weight gain and inability to swallow tablets as reason for change, respectively. Of 46 caregivers who had used all three LPV/r formulations, (50%) preferred solution, (28%) tablets and (22%) granules. Of those (25%) who had administered LPV/r granules, half of them preferred to continue with the formulation.

Conclusion: LPV/r solution was the preferred formulation by the majority of caregivers who had administered all formulations; main reason for formulation change was stock out. Further studies with a larger sample size are needed to effectively assess which formulations should be advocated nationally.

Keywords: *Caregiver; Perception; Lopinavir; Formulation; Sachets; Tablets*

HSPH9: Respectful care an added extra: a grounded theory study exploring intrapartum experiences in Zambia and Tanzania

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Background: Quality of maternal and newborn care is integral to positive clinical, social and psychological outcomes. Respectful care is an important component of this but is suboptimum in many low-income settings. A renewed energy among health professionals and academics is driving an international agenda to eradicate disrespectful health facility care around the globe. However, few studies have explored respectful care from different vantage points.

Methods: We used Strauss and Corbin's grounded theory methodology to explore intrapartum experiences in Tanzania and Zambia. In-depth interviews were conducted with 98 participants (48 women, 18 partners, 21 health-providers and 11 key stakeholders), resulting in data saturation. Analysis involved constant comparison, comprising three stages of coding: open, axial and selective. The process involved application of memos, reflexivity and positionality.

Results: Findings demonstrated that direct and indirect social discrimination led to inequity of care. Health-providers were

believed to display manipulative behaviours to orchestrate situations for their own or the woman's benefit, and were often caring against the odds, in challenging environments. Emergent categories were related to the core category: respectful care, an added extra, which reflects the notion that women did not always expect or receive respectful care and tolerated poor experiences to obtain services believed to benefit them or their babies. Respectful care was not seen as a component of good quality care, but a luxury that only some receive.

Conclusion: Both quality of care and respectful care were valued but were not viewed as mutually inclusive. Good quality treatment (transactional care) was often juxtaposed with disrespectful care; with relational care having a lower status among women and healthcare providers. To readdress the balance, respectful care should be a predominant theme in training programmes, policies and audits. Women's and health-provider voices are pivotal to the development of such interventions.

Keywords: *Respectful Care; Intrapartum Experiences; Quality Maternal and New-born Care*

HSPH10: Lay and healthcare providers' experiences to inform future of respectful maternal and newborn care in Tanzania and Malawi: An appreciative Inquiry

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Background: Disrespectful care, which remains prevalent in low and middle-income countries (LMICs), acts as a barrier to women accessing skilled birth attendance, compromising care when services are available. Building on what was positive in facilities, we aimed to explore lay and healthcare providers' experience of respectful care to inform future interventions. Five maternity facilities in Mwanza Tanzania and Lilongwe Malawi. 94 participants in Malawi (N=46) and Tanzania (N=48) including 24 women birthing live baby within the previous 12 months; 22 family members and 48 healthcare providers who regularly provided maternity care in the included facilities

Methods: The study was guided by Appreciative Inquiry (AI). Semi-structured, one-to-one interviews were conducted between January and December 2019. Interviews were audio-recorded, translated where necessary, transcribed verbatim, and analysed using the framework approach.

Results: Four main themes describing participants positive experience and their vision of respectful care were identified: (1) empathic healthcare provider-woman interactions including friendly welcome and

courteous language, well-timed appropriate care and information sharing, (2) an enabling environment, characterized by improvement of physical environment, the use of screens, curtains and wall partitions for privacy, availability of equipment and provision of incentives to staff, (3) supportive leadership demonstrated by the commitment of the government and facility leaders to provision of respectful care, ensuring availability of guidelines and policies, supportive supervision, reflective discussion and paying staff salaries timely, (4) providers' attitudes and behaviour characterised by professional values through readiness, compassionate communication and commitment.

Conclusion: The positive experiences of service users, families and healthcare providers provided insight into key drivers of respectful care in facilities in Tanzania and Malawi. Interventions targeting improved environment and privacy, healthcare provider communication and developing positive leadership structures in facilities could provide the basis for sustained improvement in respectful and dignified maternal and newborn care in LMICs.

Keywords: *Respectful Care; Appreciative Inquiry; Maternal and New-born Care*

HSPH11: Knowledge on Proper Hospital Waste Management among Nursing 4th Year Students Studying at the Catholic University of Health and Allied Sciences, Mwanza Tanzania.

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Background: Teaching in nursing education is vital for the preparation of nurses and midwives. To prevent cross-infections in hospital, student nurses should have adequate knowledge and skills on proper hospital wastes management. Health care waste encompasses various forms of waste such as sharps, human body parts, blood, chemical wastes, pharmaceutical wastes, and medical devices. Most of this waste is generated from hospitals and primary care facilities, laboratories, mortuaries, autopsy centres, laboratories, blood banks and home-based care. Therefore, mismanaged wastes such as sharps contaminated with blood facilitates transmission of infections such as hepatitis B, hepatitis C, HIV/AIDs and other viral infections. Health care workers, patients, workers in support services, visitors to health facilities, waste handlers, scavengers, foetuses in the wombs, and the general public are susceptible to these infections. Nurses play a big part to

prevent such conditions. This study aimed to identify the gaps in the knowledge and practices on waste segregation among nursing students studying at CUHAS in Mwanza-Tanzania.

Methods: A cross-sectional research design was used to gather data from 56 nursing (BSN4) students at the Catholic University of health and Allied Sciences.

Results: The majority (59%) of the participants knew that sharp containers were taken for incineration when three-quarter full. Also, more than half (66%) of participants knew about the segregation method of hospital waste management.

Conclusion: Knowledge about hospital waste and its management was not sufficient among student nurses of year four. As they had insufficient knowledge regarding hospital waste storage and disposal, they could not manage it efficiently. Therefore, compulsory continuous training should be enforced for nursing students as well as nurses.

Keywords: *Biomedical Waste; Knowledge; Practice; Management*

HSPH12: Assessment of Knowledge, Attitude and Practice of Dog owners to Rabies Disease in Kahama Municipal Council, Shinyanga

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Background: Rabies is a fatal zoonotic disease of significant public health importance. Domestic dogs are the main reservoirs and transmitters of this disease, particularly in developing countries. Rabies burden in Tanzania was 4.9 human deaths /100,000, based on active surveillance data on bite incidence. Community awareness about rabies is one of the key components for prevention. This study describes the knowledge, attitudes and practices about rabies disease among dog owners at Kahama municipal council, Shinyanga.

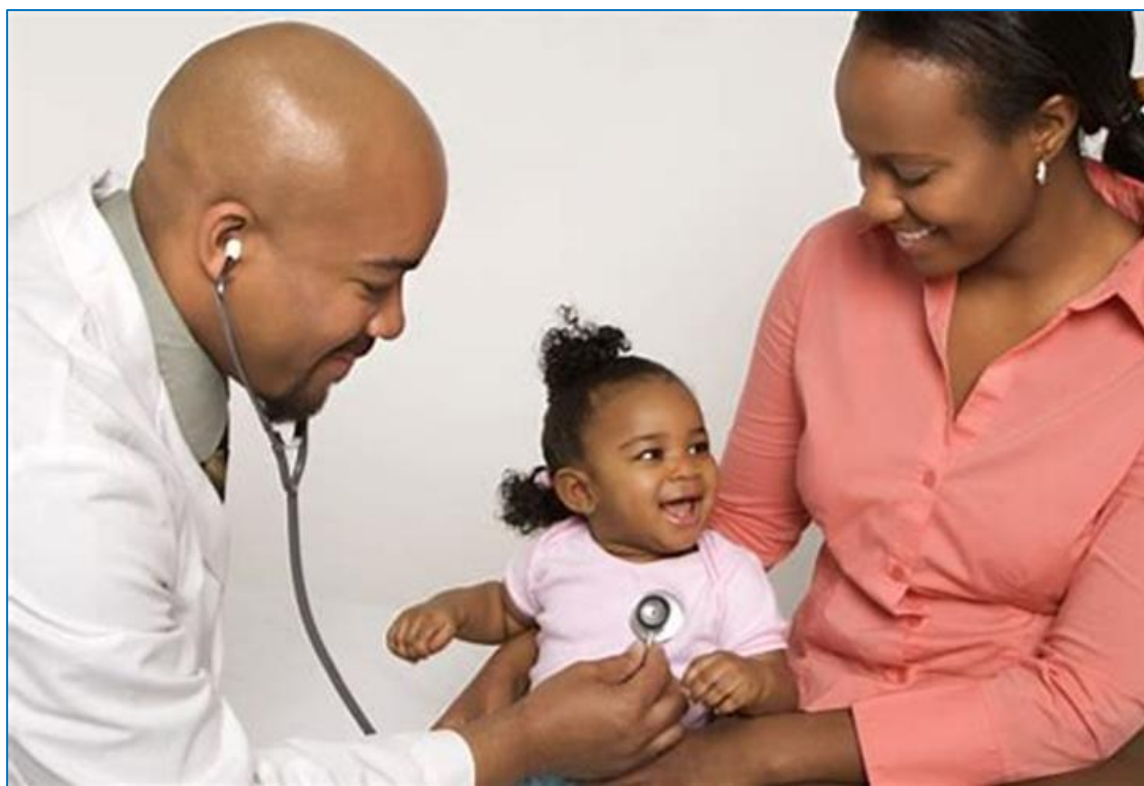
Methods: This was a cross-sectional community-based study undertaken in May 2021. Structured questionnaires were administered to collect the data among 422 dog owners. The information collected included demographic characteristics of the dog owners, knowledge, attitude and practice of dog owners towards rabies. Data were analysed using SPSS statistical software version 20. Associations between demographic variables and knowledge, attitude or practice scores were assessed using χ^2 analysis.

Keywords: *Knowledge; Attitude; Practice; Rabies; Vaccination; Dog Owners*

Results: Out of 422 respondents, 421 (99.76%) knew that rabies could be transmitted by dogs, 384 (91%) knew that rabies could be prevented by vaccination of dogs, 269 (63.74%) knew the symptoms and signs, 379 (89.81%) believed that it was necessary to vaccinate all owned dogs but 227 (53.79%) had not vaccinated their dogs. Education level ($p=0.006$) and occupation ($p=0.002$) were significantly associated with a positive attitude whereby those with higher level of education and farmers were likely to have a good attitude. Education level was also significantly associated with practice whereby respondents with lower education level had a lower practice score.

Conclusion: This study concluded that respondents had good knowledge, relatively good attitude and poor practice towards rabies prevention and control. Rabies awareness with emphasis on importance of vaccination as well as vaccination campaigns should therefore be intensified especially among the least educated dog owners.

SUB-THEME: MATERNAL AND CHILD HEALTH (MCH)



MCH01: Female Genital Schistosomiasis is a Women's Issue, but Men Should Not Be Left Out': Transforming Men's Perspectives to Promote Care for FGS in Tanzania

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Background: Female Genital Schistosomiasis (FGS) causes gynaecologic symptoms among women and girls living in sub-Saharan Africa. Despite continued efforts to raise awareness in communities about schistosomiasis, FGS remains poorly recognized. This study aimed to understand men's knowledge and perceptions of FGS in North-western Tanzania, and how this affects women's FGS care.

Methods: We conducted 18 focus group discussions with adolescent boys (15-20 years), adult men (20- 45 years), and older men (>45 years), and 19 key informant interviews with influential community members (e.g., traditional healers, pastors) in 5 districts. Participants were purposively selected in collaboration with village leaders and provided written informed consent for participation.

Results: A total of 140 participants participated in focus group discussions or key informant interviews. Most participants were not aware of FGS and perceived FGS to be a sexually transmitted infection (STI), despite having adequate knowledge about urinary schistosomiasis. Three main themes

emerged during analysis. First, many men reported perceiving FGS-infected women as being promiscuous or unfaithful due to misperceiving FGS as an STI, which could result in men ending a relationship. Second, men reported that their engagement in FGS interventions will be critical to the interventions' effectiveness because men often regulate women's access to healthcare. Third, men can be empowered through education to promote women's uptake of FGS services.

Conclusion: Engaging men to address FGS holds potential to transform their negative perceptions of FGS. Further, men described their potential to support and even advocate for women's healthcare seeking when women experience symptoms that could be consistent with FGS. We propose that public health interventions in communities in which FGS is endemic and access to care is limited, which are often highly patriarchal, should leverage men's positions within society by engaging men to promote women's health interventions.

Keywords: *Female Genital Schistosomiasis (FGS); STI; Women's health*

MCH02: Uterine Compression Suture for Management of Postpartum Haemorrhage: Case Series and an Introduction of Mnemonic Compass as a Guide in Low Resource Health Settings

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Background: Postpartum haemorrhage (PPH) due to uterine atony is the leading cause of maternal death worldwide. In Tanzania, PPH causes 25% of all maternal deaths. Uterine compression sutures (UCS) are surgical methods applied mainly in uterine atony when medical and/ or temporary mechanical methods fail to control bleeding after birth. The effectiveness of UCS ranges from 76-100% timing being one of the major factors. In many health facilities in Tanzania, these techniques are seldom applied despite their effectiveness in PPH control. We present case series managed by UCS from Muhimbili National Hospital and introduce the mnemonic "COMPASS" as a guide.

Methods After simulation training on three UCS; B-Lynch suture (BL), Hayman suture (HS) and, Cho suture (CHS) at MNH we made follow up of all patients managed by UCS when medical method failed, from January 2020 to July 2021. The

mnemonic COMPASS was used as a surgeon guide whereby **C** means **compress** first manually to see the likelihood of UCS success, **O** means **On** time (5-15min), **M** for **medications**, **P** for **pressure** (use suture materials with low pressure), **A** for right **Approach** and **SS** for **surveillance**.

Results: Uterine compression sutures were applied to 15 patients. Eight (53%) were prime parous of them 2 got live babies. All patients had uterine atony. The mean blood loss was 1426 mls. The techniques were effective to 14(93.3%) patients. One conceived after 5 months delivered at term.

Conclusion: The case series show BL and HS are effective in controlling bleeding post caesarean section in cases of uterine atony. The mnemonic COMPASS as a guide for effective application of UCS will help doctors to remember the important steps and requirements when applying UCS

Keywords: *Uterine Compression Suture; Postpartum Haemorrhage; Mnemonic; Low Resource Health Facilities*

MCH03: Uterine Model-Based Simulation Training on Uterine Compression Sutures Placement for the Management of Postpartum Haemorrhage at Muhimbili National Hospital Dar Es Salaam

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Background: Postpartum haemorrhage (PPH) due to uterine atony is the major cause of maternal mortality and morbidity worldwide. In PPH, uterine compression sutures (UCS) are applied when pharmacological and/ or mechanical methods fail to control bleeding due to uterine atony. UCS techniques were seldom used at Muhimbili National Hospital despite uterine atony being the second most common cause of Peripartum hysterectomy. No practical training on UCS had been done in the department, therefore, to impart knowledge, skills and positive attitude on UCS, a simulation training using mattress uterine model was done.

Methods: The study was cross-sectional among all medical doctors involved directly in management of PPH. Mattress uterine models were used in the training. The training had a PowerPoint presentation and a practical session on B-Lynch, Hayman, and Cho suture techniques. Pre-tested pre- and post-training self-administered structured questionnaires were used before and after

training respectively. The participants reported self-perceived knowledge, skills, and attitude to apply UCS through Yes/No and Likert-scale type questions. Wilcoxon matched-pairs signed-rank test used to compare the median score before and after training. A p-value of < 0.05 was considered statistically significant.

Results: Sixty-nine doctors participated in the training. The majority were residents 49 (71.1%), obstetricians 15 (21.7%) and registrars 5 (7.2%). Nine (13.0%) reported they had UCS training with practical sessions previously. Statistically, there was a significant improvement in self-perceived knowledge, skills, and attitude on UCS after training to all participants (P < 0.001). Sixty-eight (98.6%) of participants agreed that such training was useful.

Conclusion: Simulation training on uterine compression suture techniques using mattress uterine model showed improvement on self-perceived knowledge, skills and, attitude in applying B-Lynch, Hayman, and Cho sutures in management of PPH.

Keywords: *Simulation training; Postpartum haemorrhage; Uterine compression sutures*

MCH04: Perinatal Common Mental Disorders among Women Attending Antenatal Clinic at a Tertiary Hospital, in Mwanza Tanzania: A Cross-Sectional Study

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Background: There is an increased vulnerability for the development of common mental disorders during the antepartum period as evidenced in depression and anxiety disorders.

Methods: A cross-sectional study was used to determine the prevalence and risk factors associated with depression and anxiety symptoms among pregnant women attending antenatal clinic at Bugando Medical Centre, a tertiary hospital in Mwanza Tanzania. A total of 380 pregnant women were recruited and interviewed by using Edinburg Postnatal Depression Scale (EDPS) and Generalized Anxiety Disorder-7 (GAD-7). The sample size was randomly selected from the clinic.

Results: The mean age of the participants was 30.35 years, with minimum and maximum age of 20 years and 47 years respectively. Almost half of the

participants (53.68%) were on the third trimester with about two-third of the participants (76.84%) reporting to have planned for their current pregnancies. The overall prevalence of depression and anxiety was 15% and 36.58% respectively. High level of education, being married, planned pregnancy, partner and family support were found to be statistically protective for both depression and anxiety symptoms while polygamy and partner violence were statistically associated with the development of depression and anxiety symptoms.

Conclusion: There is a high prevalence of both depression and generalized anxiety symptoms among the studied population, which emphasizes the importance of earlier screening, detection and intervention to reduce the burden of morbidity and disability.

Keywords: *Antepartum; Pregnancy; Anxiety; Depression; Mental Health; Women; Tanzania*

MCH05: Indications and Immediate Perinatal Outcomes of Mandated Pre-Term Birth at Three Selected Referral Centres in Mwanza, Tanzania

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Background: Preterm birth (PTB) is a global problem with a prevalence ranging from 5 to 18% leading to prematurity which further leads to increased mortality, morbidity and long-term health outcomes. Studies have shown that worldwide 20 to 30% of preterm babies are mandated due to maternal or foetal conditions that jeopardize the health of the mother or foetus. Over 80% of the world's neonatal deaths annually are due to complications related to PTB and are from sub-Saharan Africa (SSA) and Asia. The study aimed at determining the indications and immediate perinatal outcomes of mandated preterm birth in Mwanza, Tanzania.

Methods: A cross-sectional study involved women delivered at gestational age less than 37 weeks at three selected referral centres in Mwanza. Data were collected using questionnaires, double entered using Epi-info, cleaned, and analysed using STATA version 15.

Results: A total of 2230 women delivered during the study period, in which 402 delivered preterm babies where among them 246 were mandated and 156 were spontaneous preterm birth. The prevalence of mandated pre-term birth among all preterm deliveries was 61.2%. The indications for mandated preterm birth were hypertensive disorders of pregnancy (48.4%), preterm premature rupture of membrane (35.4%), antepartum haemorrhage (13.8%) and others 2.4%. Perinatal mortality up to the first 48 hours of life was 16.2% and factors associated with perinatal mortality included very low birth weight and the low Apgar score of < 7 at the 5th minute.

Conclusion: The prevalence of mandated preterm birth was found to be 61.2% and the leading indications were hypertensive disorders of pregnancy. We recommend early hypertension management to prevent severe forms hence will prevent or reduce mandated premature deliveries

Keywords: *Perinatal Outcomes; Preterm birth; Tanzania*

MCH06: Association between Antenatal Corticosteroid Use and Perinatal Mortality among Preterm Births in Hospitals in Tanzania

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Background: This study aimed to investigate if exposure to antenatal corticosteroids (ACS) was associated with lower rates of perinatal mortality (primary outcome) and other adverse perinatal outcomes (i.e., stillbirth, early neonatal mortality, APGAR score of < 7 at 5 mins, neonatal sepsis and respiratory distress syndrome) and factors associated in preterm infants in hospitals in Tanzania.

Methods: A hospital-based prospective chart review study was undertaken in four hospitals located in Nyamagana and Sengerema districts, Tanzania. The study population included all stillborn and live born preterm infants delivered between 24 to 34 weeks of gestation between July 2019 to February 2020. A total 1125 preterm infants were delivered by 1008 women (895 singletons, 230 multiple). Sociodemographic and medical data were recorded from medical records.

Results: A total of 356 (35.3%) women were administered at least one dose of ACS

between 24 to 34 weeks' gestation and 385 (34.2%) infants were exposed to ACS. Infants exposed to ACS had a lower rate of perinatal mortality (13.77%) compared to those who were not exposed (28.38%). Multivariate analysis indicated that infants exposed to ACS were less likely to die during perinatal period, aRR 0.34 (95%CI 0.26-0.44). Only one-third of the sample was provided with ACS. Administration of ACS was associated with maternal education, attending antenatal care more than 3 times, method used to assess gestational age, maternal infection, exposure to maternal antibiotics, delivery mode and level of health facility.

Conclusion: ACS significantly reduced the risk in perinatal mortality among infants born preterm in a limited resource setting. However, only about one-third of eligible women were provided with ACS, indicating low usage of ACS. Numerous factors were associated with low usage of ACS in this setting.

Keywords: *Antenatal Corticosteroid Use; Perinatal Mortality; Preterm Births*

MCH07: Preconception Care Utilization among Women of Childbearing Age in Nyamagana, Mwanza

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Background: Preconception care (PCC) is a necessity for women at reproductive age, because by the time a pregnant woman makes the first visit, it may be too late to prevent or reverse placental development problems, birth defects or maternal diseases. Understanding knowledge and utilization of PCC is vital towards improving maternal health outcomes. This study determined knowledge, attitude, and practice of PCC among women of reproductive age in Mwanza.

Methods: A cross-sectional study recruited 384 women of reproductive age. Interviews used a pretested semi structured questionnaire. Data was summarized by measures of central tendency (mean, median, mode). Binary then multivariate logistic regression analysis was done to examine the effect of predictors of PCC knowledge attitude and practice. Odds ratio, 95%CI and P-value 0.05 were used to make the comparisons, find the degree of uncertainty and proportions respectively.

Results: 41.4% (159/384) had adequate PCC knowledge, 49.4% (190/384) agreed PCC is important, 32.81% (126/384) practiced PCC. Secondary education or higher (AOR=4.53, 95% CI = 1.14-17.98, p=0.032), age above 36 years (AOR=0.15 95% CI = 0.05-0.46, p= 0.001) were associated with adequate PCC knowledge. Married (AOR=0.33, 95% CI=0.15-0.71, p=0.004) and government employee (AOR=6.96, 95% CI =2.71-17.90, p <0.001) were more likely to have a positive attitude towards PCC. Primary education or higher (AOR=82.79, 95% CI = 9.89 – 693.08, p <0.001), age above 26 (AOR=2.75 95% CI = 1.28 -5.88, p= 0.009) were associated with good practice of PCC.

Conclusion: There is poor knowledge, attitude and practice towards PCC among women of reproductive age. Formal education has shown to increase utilization of PCC. Programs to improve all socioeconomical aspects of women can improve utilization of comprehensive maternal health services.

Keywords: *Preconception care; Knowledge; Attitude; Practice; Pre-antenatal care*

MCH08: Prevalence, Patterns and Associated Factors for Neural Tube Defects among Young Infants Admitted at Bugando Medical Centre in North-western Tanzania.

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Background: In Tanzania, neural tube defects (NTDs) have been increasing, thus increasing morbidity and mortality in young infants. At Bugando Medical Centre (BMC)-a tertiary hospital serving the population of North-western Tanzania, the cases of NTD are commonly reported, but exact prevalence, patterns and associated factors in young infants remain unknown. This study determined the prevalence, patterns and associated factors for NTD among young infants admitted at BMC.

Methods: A cross-sectional observational study involved young infants aged 0-3 months admitted at BMC. A census sampling technique ensured that all young infants with and without NTD who consented were involved. A questionnaire-administered questionnaire was used to collect information from the infants' mothers. Data were managed using Microsoft Excel database and were cleaned and imported to STATA version 13 for analysis. Multivariate logistic

regression analysis done; significant levels was set at p-value less than 0.05.

Results: A total of 525 young infants were enrolled in the study from February to May 2021, of which 298 (56.8) were male. NTDs was found in 73 (13.9%) of the 525 infants hospitalized at BMC, and the most common pattern was myelomeningocele 50(68.5%). Failure to use folic acid supplementation during preconception and early first trimester, living in rural residence, lower education and overweight during pre-conception period are the key factors associated with NTD among young infants.

Conclusion: This study demonstrated that NTD is one of the prevalent conditions contributing to admission among young infants at BMC. Furthermore, the use of folic acid supplement in preconception should be emphasized to all women of reproductive age since folic acid use have been reported to reduce NTD in various studies including the present study.

Keywords: *Neural tube defect; NTDs types; young infants*

MCH09: High Mortality among Premature Neonates with Positive Blood Culture Neonatal Sepsis in a Tertiary Hospital, Tanzania: A Call For Action

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Background: Well documented vital signs are key in the prediction of sepsis in low- and middle-income countries. We determined prevalence, associated factors and outcomes of positive blood culture sepsis in premature neonates at Bugando Medical Centre Mwanza, Tanzania.

Methods: Temperature, oxygen saturation, heart rate, respiratory rate and random blood glucose were repeatedly recorded at admission, 8 hours, and 24 hours in all 250 neonates enrolled. Clinical and microbiological data were collected from patient's records followed by descriptive data analysis.

Results: The mean age of neonates was 3 ± 5 days with the majority (90%) aged <10 days. The prevalence of positive blood culture sepsis was 21.2% (95%CI: 16.1-

26.2). Fluctuation of random blood glucose (RBG) [aOR= 1.34, 95%CI: (1.07-1.67), p=0.010], low oxygen saturation [aOR= 0.94 95%CI: (0.88-0.99), p=0.031], premature rupture of membrane [aOR=4.28, 95%CI: (1.71-10.71), P=0.002], gestation age < 34 weeks [aOR=2.73, 95%CI: (1.20-6.24), p= 0.017] and home delivery (aOR=3.90, 95%CI: (1.07-14.19), p=0.039] independently predicted positive blood culture. Deaths were significantly more in neonates with positive blood culture than those with negative blood culture (32.1% vs 5.1%, p<0.001).

Conclusion: In resources limited settings, clinicians should use vital signs and clinical information to timely initiate sepsis treatment among preterm neonates to prevent deaths and other morbidities.

Keywords: *Preterm; vital signs; neonatal sepsis; mortality*

MCH10: Geophagy Practices in Pregnancy and Increased Prenatal Urinary Toxic Chemicals (Arsenic) among Women in North-western Tanzania – A Forgotten Public Health Hazard

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Background: Women are exposed to arsenic through geophagy practices—soil eating behaviour especially during pregnancy which is common in these settings. The edible soil chosen by pregnant women has been reported to contain arsenic. There is a contention that, pregnancy-related geophagy practices may be contributing to the increase of arsenic levels among pregnant women, however, this was not studied. This study examined if pregnant related geophagy practices was associated with prenatal urinary arsenic levels among pregnant women who eat soil in North-western Tanzania.

Methods: This was a cross-sectional study, as part of the human bio-monitoring (HBM) longitudinal investigation. Data on total arsenic levels in urine among pregnant women were collected using unprovoked morning urine samples. Urine samples were analysed using inductively coupled plasma mass spectrometry (ICP-MS). Hierarchical regression analysis was conducted to identify which independent variables predict significantly higher level of Arsenic.

Results: The prevalence of geophagic practices during pregnancy was 40.9%. The median level of arsenic was 9.2µg/L (IQR: 4.6 - 213µg/L. Pregnant women with a history of eating soil in areas with gold mining activities had 2.8 times higher prenatal urinary arsenic levels (95%CI: 1.93, 4.02; *p*-value <0.0001) as compared to those with no such history. Also, prenatal arsenic levels increased by 13% among pregnant women with geophagic practices (β 1.13, 95%CI: 0.54-2.4; *p*<0.0001) compared to those without such practices.

Conclusion: Soil eating behaviour was significantly associated with increased concentration of arsenic levels even after controlling for other variables. Arsenic levels among the studied population in North-western Tanzania were higher above the recommended levels. This calls for need to design community targeted interventions to reduce the habit of eating soil among women, so as to reduce the risk of increased levels of arsenic levels especially during pregnancy.

Keywords: *Geophagy Practices; Pregnancy; Arsenic; Gold Mining; Urine; Soil Eating*

MCH11: Prevalence and Factors Associated with Unintended Pregnancy among Women Attending Antenatal Clinic in General Hospital in Dodoma, Tanzania

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Background: Unintended pregnancy is a potential hazard for every sexually active woman as it poses a serious threat to the health and well-being of families globally. Information on Tanzanian women who conceive unintentionally is rarely documented. Understanding the extent of unintended pregnancy and the factors associated is crucial to devise evidence-based interventions. This study aimed to determine the prevalence of, and factors associated with unintended pregnancy.

Methods: This was a hospital-based cross-sectional study. A total of 300 pregnant women were recruited through random sampling and questionnaires were pre-tested and administered. Multiple logistic regression analysis was performed using SPSS version 20 software to identify the factors associated with an unintended pregnancy.

Results: The overall prevalence of unintended pregnancy was found to be 73 (24.3%) and those who wanted it at a later time and not at all accounted for 143 (47.7%) and 227 (75.7%) respectively. The

Keywords: *Unintended pregnancy; Antenatal clinic; Tanzania*

prevalence of unintended pregnancies decreased with the use of emergency contraceptives and being married. However, it increases in lower age 15 to 20 years 67.3% (99/147) at first pregnancy, those who have high parity 54.5% (12/22), divorced 57.1% (4/7) and not married 62.7% (37/59). The prevalence was independent of the use of modern contraceptives, the number of sexual partners, and the level of education of the mother.

Conclusion: Unintended pregnancy is one of the major reproductive health problems since approximately over a quarter (24.3%) of the pregnant women attending ANC had unintended pregnancy experience. There is a need to inaugurate a community-based program through increasing knowledge of family planning by designing strategic policy programs aimed at creating more sensitization on reducing the unintended pregnancy reflecting those with young age, high parity, and not married.

MCH12: Factors Associated with Exclusive Breastfeeding among Infants aged 6 to 9 months in Mwanza, Tanzania

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Background: Exclusive breastfeeding (EBF) provides young infants with necessary nutrients for growth and development as well as preventing most of the childhood illnesses. Studies on breastfeeding have shown that EBF rates in many countries are far from 100% and that EBF differs between and within populations. In Tanzania, the prevalence of EBF among infants under 6 months is 59%. Therefore, in Tanzania there about 40% of the infants are not exclusively breastfed and thus at risk of infectious diseases and malnutrition. This study investigated factors associated with exclusive breastfeeding among women with infants 6 to 9 months old, in Mwanza Tanzania.

Methods: A cross sectional hospital-based study involving 300 mothers with infants aged 6 to 9 months of age attending clinic in Makongoro reproductive and child health clinic and Nyamagana district

hospital in Mwanza. Data was collected by using structured data collection tool and analysis was done by using STATA version 13.

Results: The mean age of enrolled children was 8 months. The prevalence of exclusive breastfeeding among consenting women with infants in this study was 81.7%. Exclusive breastfeeding was significantly associated with being a child from mother who is self-employed/housewife ($p=0.004$) and small family size ($p=0.003$).

Conclusion: The prevalence of exclusive breastfeeding is indeed higher in Mwanza and is significantly associated with mother's occupation (self-employed, housewives) and small household size. This indicates that there has been successful implementation in reproductive and child health services promotion.

Keywords: *Exclusive breastfeeding; Infants; Tanzania*

MCH13: Prevalence and Factors Associated with Allergic Sensitization among Children Attending Rural and Urban Primary Schools in Mwanza, Tanzania

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Background: Allergic diseases are among the most common misdiagnosed conditions and leading indication for children to attend outpatient clinics. Misdiagnosis can be attributed to few allergists and lack of diagnostic tools in Africa, which leads to unnecessary treatment with antibiotics, precipitating anti-microbial resistance. This study investigated the burden of allergic conditions, identified the common triggers and other factors associated with allergic sensitization in healthy school children from rural and urban areas of Mwanza.

Methods: A cross-sectional study was conducted at Sengerema rural and Nyamagana urban schools. Demographic and other relevant information were collected by using Swahili-translated ISAAC questionnaire. Skin sensitization was done, interpreted and data analysed using STATA version 13.

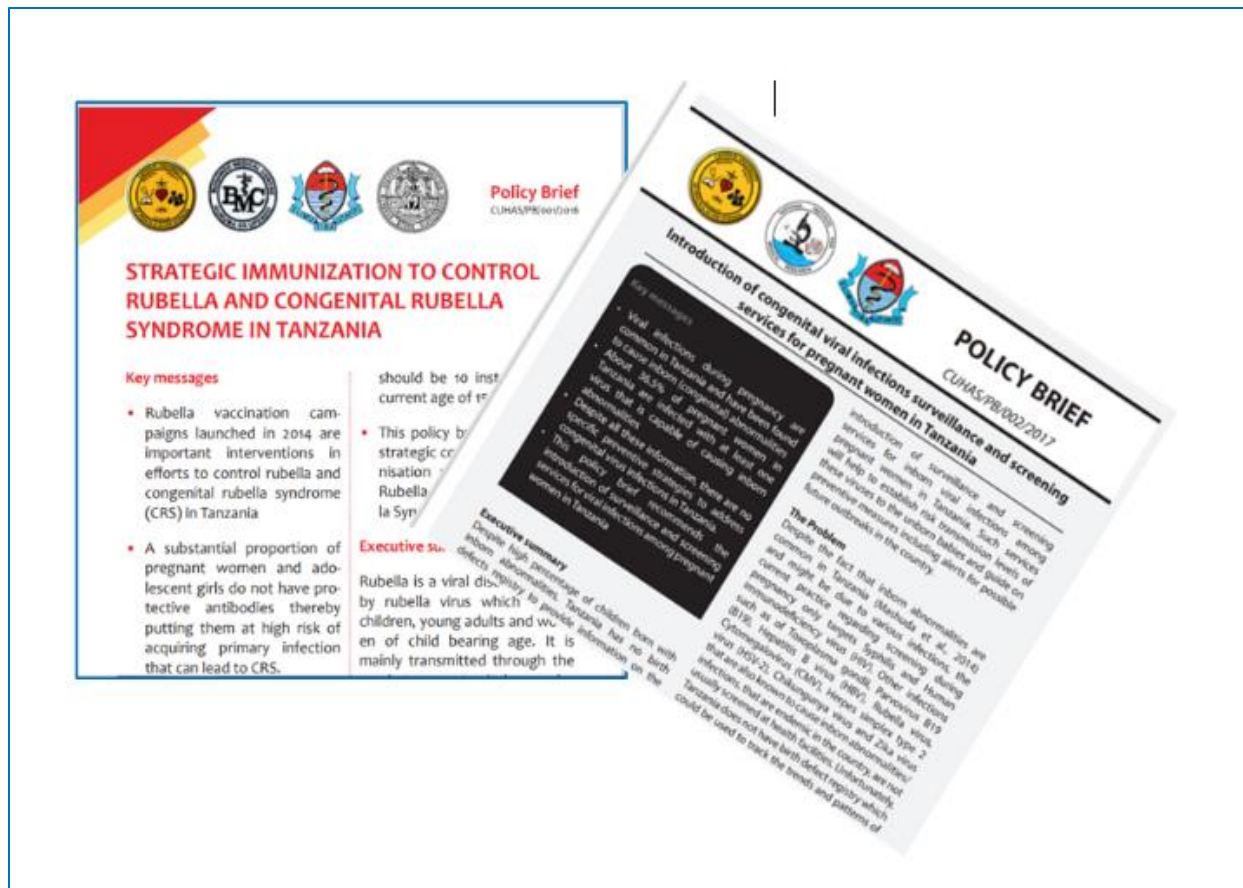
Results: A total of 345 children, with a mean age of 10.3 years responded to the survey questions. Overall prevalence of allergic sensitization was 114/345 (33.0%, 95% CI: 28-38) with common allergens detected being house dust mite 85/114(74.6%) and

grass mixtures 28/114(24.6%). Prevalence of allergic sensitization was significantly higher among children from rural areas than in urban areas of Mwanza region (97/214 (45.3%) vs. 17/131 (13.0%), $P < 0.001$) By multivariable logistic regression analysis, being a child aged 11-14 years (OR:1.7, 95% CI: 1.1-2.9, $p = 0.035$), residing in rural areas (OR:6.3, 95%CI:3.0-12.9, $p < 0.001$) and having history of rash in the past year (OR:4.5, 95%CI:1.6-12.4, $p = 0.004$) predicted allergic sensitization among children in Mwanza.

Conclusion: The overall prevalence of allergic sensitization in Mwanza is alarmingly high with a higher prevalence in rural areas. The majority of children reacted to house dust mite and grass mixture. Allergic sensitization is predicted by being in age group 11-14 years, residing in rural areas and having a history of rash in the past year. Further studies to ascertain reactivity to more common allergens in Mwanza are warranted and emphasis on allergy testing should be emphasized among clinicians.

Keywords: *Allergic Sensitization; House Dust Mite; Grass Mixtures; Mwanza*

SUB-THEME: EVIDENCE BASED POLICY BRIEFS (EPB)



EPB01: Introducing Mumps Virus Vaccine in the National Immunization and Vaccine Development Programme in Tanzania

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Key Messages

- Mumps is a vaccine-preventable disease, however if not prevented during childhood, it can cause serious complications.
- In Tanzania nearly all children are at high risk of acquiring mumps virus infection
- Mumps vaccine is available and can be given in combination with Measles and Rubella vaccines. However, currently Mumps vaccine is not offered in Tanzania in both private and public health facilities.
- This policy brief proposes the introduction of Mumps vaccine in the national immunization and vaccine development (IVD) programme in Tanzania to reduce the possible consequences of the virus.

Executive Summary

Mumps virus infection is an acute highly transmissible viral infection commonly affecting children aged 5 to 9 years. If not prevented in childhood, Mumps virus infection can cause serious complications such as hearing loss, swelling of the testicles that can lead to infertility, swelling of ovaries, the brain and brain coverings, breasts and spontaneous abortions. Vaccination programs have dramatically reduced cases of Mumps virus in several middle and high-income countries. However, it is not being provided through the routine immunization programme in Tanzania. This policy brief recommends introduction of Mumps vaccine in the Tanzania's

Immunization and Vaccine development programme.

The Problem

Mumps is known to be an important vaccine-preventable childhood viral disease (Hviid et al., 2008). In countries with no routine Mumps vaccination, the disease occurrence is between 100 and 1000 cases/100,000 population with outbreaks peak every 2-5 years (Marin et al., 2018, Organization, 2007). In the time before the introduction of the vaccine, Mumps virus was a notable cause of disabilities in developed world with over 100,000 cases reported each year. However, there has been significant reduction of cases after introduction of Mumps vaccine (Galazka et al., 1999).

There are few published data on mumps epidemiology in Africa including Tanzania, however, outbreaks have been reported in Egypt, Zambia, Burkina Faso, Equatorial Guinea and Swaziland between 2010 and 2011 (Kateule et al., 2018). In 2015/2016 the proportion of Mumps antibodies was 63.6%, 90.8%, and 97.1% among children, adult volunteers and health care workers respectively in Sudan (Adam et al., 2020). In Tanzania, a study in Dar es Salaam documented the proportion of Mumps virus in 16% of children with hearing loss while in Mwanza the proportion of 21.4% was documented among children (Minja, 1998, Rakiru et al., 2020).

If not prevented in childhood, Mumps infection can cause serious complications in life, such as swelling of the testicles in 20–30%, ovaries in 5%, the brain and brain coverings in 50–60% and breasts in 31% of women over the age of 14 years (Orlíková et al., 2016). Moreover, Mumps virus is known to be associated with unilateral acquired hearing loss in 5 per 100,000 cases (Vuori et al., 1962). Swelling of the testicles has been reported in about 25-33% of infected males (Belsey, 1976) and men who suffer from swelling of the testicles remain at risk of infertility by 67% (Bozhedomov and Teodorovich, 2005). In pregnant women if the infection is acquired in the first three months, it can cause spontaneous abortions, accounting for about 25% (Dayan et al., 2008, Siegel et al., 1966).

Mumps virus infection seems to be ignored among many vaccine preventable diseases, because of less serious illness, however it is of potential count to people's lives due to the complications it causes later in life. Care and treatment of infertility becomes a big burden to the community and health care systems. A recent study in Kuwait showed that about 62.8% of patients with infertility problems received medical therapy with an expense of >988.74 USD (Tz Shs 2,373,400), excluding surgery (Al-Kandari and Alenezi, 2020). Moreover, psychological problems such as grief stress, anxiety, sadness, reduced self-esteem, depression, isolation and family instability have been shown to be highly related to infertility in both men and women (Fisher and Hammarberg, 2012). All these problems are of major impact on social and economic aspects in bringing up a future strong generation.

Therefore, to overcome and prevent the Mumps related complications, vaccination is the mainstay in reducing disease burden (Rakiru et al., 2020). In the context of a national Mumps immunization programme, WHO recommends making Mumps a notifiable disease. The vaccine is safe and can be given together with other vaccines as Measles, Mumps and Rubella-vaccine (MMR).

The vaccine has dramatically reduced the annual occurrence of the disease per 100,000 from 40-726 cases before introduction of vaccine to 1- 361 cases per year after introduction of vaccine (Galazka et al., 1999). However, currently Mumps vaccine is

not offered in Tanzania both in private and public health facilities necessitating the need to introduce the vaccine in the IVD programme.

Policy Options

Despite the efforts made by the Tanzania government to include important vaccines that prevent most of childhood illnesses in the IVD programme, it is equally important to consider addition of Mumps vaccine in the existing programme. Based on the above evidences, we recommend introduction of Mumps vaccine in the IVD programme. This will add efforts in preventing possible complications associated with Mumps virus infection. Based on the above information, this policy brief proposes introducing Mumps vaccine in the current National Immunization and Vaccine Development programme for children at age 1 year and 4years. This schedule has been recommended by WHO and center for Disease Control and Prevention (CDC) in countries with and effective childhood vaccination programme. Therefore, this policy brief propose rescheduling of the current 9-18months schedule to 1-4years.

Implementation Considerations

- i. To take advantage of high MR coverage in implementation of Mumps vaccination. In Tanzania the MR vaccine has been reported to have very good coverage (>80%) and high acceptability across the country. Replacing MR with MMR vaccines will eventually benefit the uptake of Mumps vaccine across the country.
- ii. Since Mumps vaccine can be given in the same schedule as MR vaccine replacing MR with MMR will be advantageous since the combination will prevent three diseases in a single vaccine shot. The MMR vaccine is available in the market, it will be easy to replace MR with MMR and get good coverage without additional difficult logistic considerations (except financial resources), that are associated with introduction of new vaccines. The median costs of MR/MMR vaccine per dose is 2,100 Tanzanian Shillings (USD 0.84) (Sim et al.,

2021). This price is reasonable and can be affordable by majority of Tanzania citizens when comparing the costs of care of the complications of the disease in life and the cost of the vaccine. However, like other countries which adopted the vaccination, this can be made optional, for those who can afford to buy. Given the fact that all suggested policy options are feasible, this matter has to be given a priority as one of the important agenda in advocating child's health.

- iii. MMR vaccine is available and has been used since 1967 in many countries, it is safe and it has efficacy of more than 90%. Despite the controversy on the Mumps vaccine being associated with autism, scientific evidence show that, Autism has strong genetic component with genesis before one year of age, when MMR vaccine is typically administered (DeStefano and Shimabukuro, 2019, Samsam et al., 2014). Henceforth having no attribution to autism.

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EPB02: The improvement of quality of delivery services to address fresh stillbirths

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Key Messages

- Unexplained fresh stillbirths (FSBs) occurring in health facilities is one of the overarching problems in maternal health services in Tanzania.
- Contributors to the causes of unexplained FSBs includes delay in seeking care, neglect, and negative staff behaviour's.
- Unexplained FSBs are associated with depression, among women, stigma and family distress
- This policy brief recommends strategies to mitigate the unexplained FSBs by improving the quality of delivery services, prompt referrals and respectful and compassionate care to expectant mothers

Executive Summary

High neonatal mortality rate (NMR) is one among the most important public health problems worldwide. The majority of neonatal deaths (87.5%) occur during the first week of life as a result of infections, complications of preterm and birth asphyxia. The high early NMR is exacerbated by unexplained fresh still births (FSBs) which contributes to over a quarter of the cases.

Women who suffer unexplained fresh stillbirths (FSBs) may face health issues that require specialized care in future pregnancies. Since FSBs are preventable, there is a need to improve delivery outcomes by strengthening intrapartum care support through effective communication, improved respectful care, supporting affected women and improve linkages among different healthcare system levels. The main objective of this policy brief is to advocate for quality delivery services and using unidentified fresh stillbirths as

be one of the indicators for quality delivery services

The Problem

Neonatal mortality is defined as death of the baby occurring during the first 28 days of life. High neonatal mortality is among the most important public health challenges worldwide with 2.4 million children dying each year (Blencowe et al., 2015). Most (98%) of these deaths occur in the Sub-Saharan Africa. In Tanzania the overall rate is 29 per 1000 live births (NBS, 2015). The majority (87.5% of these deaths occur during the first week of life. Hospital-based NMR are reported to have increased from 2.6 per 1000 live births in 2006 to 10.4 deaths per 1000 live births in 2015 (Mangu et al., 2020), the major causes of early neonatal deaths include infections, complications of preterm, birth asphyxia and respiratory distress (WHO, 2019; Mangu et al., 2020). Neonates who die during delivery process are commonly known as fresh stillbirths. Over a quarter (28%) of the causes of fresh stillbirths are unexplained (CDC, 2020; Bedwell et al., 2021). Globally, one third of the 2.6 million fresh still births have unexplained causes. In Tanzania 47,000 stillbirths occur annually, and one third (over 15,000) of these are unexplained (Blencowe et al, 2015, Alkema et al 2015). The unexplained fresh stillbirths contribute substantially to the high neonatal mortality rate. It is therefore critical to address the causes of unexplained fresh stillbirth through appropriate interventions SO AS TO ultimately reduce neonatal mortality.

Stillbirths are known to be associated with psychological effects to women, families and healthcare workers as well as causing substantial direct and indirect economic costs (Heazell et al,

2016). Stigma has been associated with unexplained fresh stillbirths and that its occurrence is often hidden by the affected communities (Kiguli et al, 2015). Most often, healthcare workers lack appropriate communication skills to handle parents affected with unexplained stillbirth due to lack of appropriate training. Recent studies on the prevention and management of unexplained fresh still births reports a complex interplay of factors influencing pregnant women to timely access health facilities for timely maternity care for good outcomes. These factors include the individual women from families and friends' motivation, as well as health worker behaviours (Laisser et al, 2021). Late referrals have also been reported to cause delays in accessing care, ending up with complications associated with poor outcomes, including unexplained FSBs (Lavender et al, 2020). Moreover, inefficient women support and disrespectful care characterized by mistreatment presenting as physical, sexual and/or verbal abuse, stigma and discrimination, failure to meet professional standards of care, poor rapport between women and providers and health system conditions have been reported to influence the delivery outcomes in Tanzania (Mdoe et al, 2021). Disrespectful care negatively impacts on childbirth experiences and actively deters women from timely attending health facilities for safe deliveries. Lack of appropriate counselling of women affected with unexplained fresh still births has been described to prolonged trauma leading to negative psychological effects (Gausia et al., 2011).

The need for quality maternal health improvement among women and their neonates has been an agenda of the government of Tanzania, over the past decade. Several interventions including public health strategies, clinical, safe motherhood and health system strengthening are being employed in the efforts to ensure significant reduction in unexplained fresh stillbirths. However, significant reduction of the problem is yet to be realized URT (2021). Despite the magnitude of unexplained SB, the problem is neither addressed in the global Sustainable Development Goals (UN,2015 nor in the Tanzania Health sector Strategic plan V. This policy brief

intends to advocate effective healthcare facility delivery services to reduce unexplained fresh still births and its impact in Tanzania.

Policy Options

Effective birth delivery services have proved to be critical for maternal and new-born survival. Improved birth delivery services can reduce unexplained fresh still births. Therefore optimizing interventions during this period is critical. The proposed actions to be taken to mitigate unexplained fresh still births are: promoting timely referrals, improving capacity of healthcare workers in their clinical decision skills and reducing negative staff behaviour challenges (WHO, 2018). This policy brief underscores the importance of better communication and linkages among referring and receiving facilities, respectful care to women by staff and the development of bereavement care services as policy options to reduce unexplained fresh stillbirths and its impacts.

Policy option 1: Strengthening communication and linkages among lower, middle and higher level facilities during referrals

This policy brief recommends for the following directives by policy makers:-

Reinforcement of effective referral mechanism.

This should include

- i. Regular meetings between referring and receiving facilities focusing on delays resulting from communication barriers affecting women in labour causing unexplained fresh still births.
- ii. Provision of basic communication resources such as mobile telephone facilities to the targeted transferring and receiving staff. It is equally important for that continue professional development (CPD) is provided to healthcare providers to improve competencies of interpersonal and intrapersonal skills for prevention of unexplained fresh stillbirths.

Policy option 2: Promoting respectful and compassionate care among staff working with delivering women

Respectful care is a fundamental human right and a key determinant of positive childbearing

experience. Efforts to ensure healthcare workers' behaviour changes would reduce unexplained fresh stillbirths. Therefore this policy brief recommends for the following measures:-

- i. Re-orientation of the Clients health service charter to healthcare workers and CPD sessions on customer care services (URT, 2018)
- ii. Improve capacity of staff in the understanding and application of RCC competences of respectful and compassionate maternity care (RCC) to all staff using the RCC guidelines (URT,2021) and
- iii. The Council Health management Teams/ health facility management teams to ensure effective supportive supervision to healthcare workers focusing on maintenance of recommendations for safe birth practices (WHO, 2018).

Policy option 3: Initiation of bereavement care to women affected with Fresh Still Births

Evidence have demonstrated that empathetic and compassionate care from healthcare workers positively enhances parents adjustment and recovery after stillbirth, their ability to care for others and future contacts with health services (AllianceWR,2011). Open and supportive relationships can also benefit health workers in addressing their emotional responses to poor outcomes such as in unexplained fresh stillbirths (Hutt et al, 2016). Improvement of follow up to parents with unexplained fresh stillbirths after discharge is important. Therefore, this policy brief recommends for the government to:

- i. promote the use of bereavement care services in health services;
- ii. introduce health worker bereavement services to encourage support of parents affected by unexplained stillbirths;
- iii. provide continuous professional development sessions for healthcare staff on psychosocial services to women and parents experiencing unexplained fresh stillbirths; and iv. Advocate for postnatal services and follow up of parents with unexplained stillbirth through health promotion activities and home visiting.

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EPB03: Improving Diagnosis of Syphilis in Tanzania: Time for Bold Actions

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Key Messages

- Syphilis caused by *Treponema pallidum*, has been associated with illnesses and a substantial number of deaths worldwide.
- Despite availability of rapid cost-effective testing and treatment, syphilis has been associated with unfavorable pregnancy outcomes among pregnant women and brain infections among HIV/AIDS patients
- The current practice in detection of syphilis in many low-and middle-income countries (LMICs) do not follow algorithms recommended by the World Health Organization (WHO)
- In these countries detection of syphilis cases depends mostly on screening with non-treponemal test which is associated with misdiagnosis in a significant proportion of patients.
- This policy brief proposes the introduction of mandatory syphilis confirmatory test to reduce misdiagnosis and hence, inappropriate use of antimicrobials and social conflicts

Executive Summary

Evidences from Tanzania show high occurrence of syphilis in pregnant women and other high-risk groups attending sexually transmitted infections (STIs) clinics. Syphilis has been associated with unfavorable pregnancy outcomes and with increased risk of transmission of other STIs including Human Immunodeficiency Virus (HIV). Appropriate diagnosis using WHO recommended algorithm that involves treponemal and non-treponemal tests followed by appropriate treatment is key in controlling syphilis in both

high- and low-income countries. This policy brief proposes the adoption of the forward algorithm in detection of *T. pallidum* infections in low-risk group and reverse algorithm is high risk groups.

The problem

The prevalence of syphilis in Tanzania ranges between 2.5 to 8% in different population which falls under moderate endemic as per WHO (Watson-Jones et al., 2002; Lawi et al., 2015; Manyahi et al., 2015; Ng'Wamkai et al., 2019; Haule et al., 2020) . Syphilis can seriously complicate pregnancy and result in spontaneous abortion, stillbirth (25%), intrauterine growth restriction, and perinatal deaths (24%), as well as serious complications in newborn infected children (WHO, 2017). Misdiagnosis of syphilis and hence wrong treatment increase the burden of antimicrobial treatment as well as other side effects related to drugs with possibility of social conflicts among couples (Nakku-Joloba et al., 2019). Despite availability of reliable methods of detection and inexpensive treatment options, the burden of syphilis in LMICs is reasonably high. In these countries some efforts have been made, however effectiveness in the detection has not been well achieved.

The second edition of the standard National Guidelines for Management of Sexually Transmitted and Reproductive Tract Infections guidelines (2018) in Tanzania, recommends screening using rapid treponemal serological test (UNDP and WHO, 2003). Furthermore, guidelines provide no direction as to whether or not the non-treponemal tests should be done. Since the treponemal tests cannot distinguish

between past treated infections and the current ones, the practice results into over diagnosis of syphilis.

The critical and key stage in treatment and reduction of the syphilis associated complications is by having the right diagnostic method(s) (Syphilis Testing Algorithms Using Treponemal Tests for Initial Screening --- Four Laboratories, New York City, 2005--2006, no date). The World Health Organization (WHO) recommends using of treponemal and non-treponemal tests in a sequential manner in the diagnosis of syphilis (WHO, 2017). The current practice in diagnosis of syphilis in most HICs has been either forward algorithm (non-treponemal followed by treponemal) or reverse algorithm (treponemal followed by non-treponemal) (Organization, 2005; Dunseth, Ford and Krasowski, 2017). Forward algorithm is recommended to be used in low-risk groups while the reverse algorithm to be used among the high-risk groups (Ortiz, Shukla and Loeffelholz, 2020). Reverse algorithm has been found to be of advantage in detecting past infections, latent syphilis and tertiary syphilis (Voth and Akbari, 2007; Ortiz, Shukla and Loeffelholz, 2020). This brief proposes the adoption of specific algorithm in different populations to ensure appropriate diagnosis of syphilis in health facilities in Tanzania.

Table 1: Summary of populations and Treponema and Non Treponemal test results

SN	Study population	Sample size	Non Treponemal test	Treponemal test	% Wrongly treated
1	Adults HIV seropositive	450	63/450(14%)	45/450(10%)	18/450(4%)
2	Women with macerated Stillbirth	300	30/300(10%)	18/300(6%)	12/300 (4%)
3	Women opting for IUCD	150	10/150(6.7%)	8/150(5.3%)	2/150(1.3%)

Policy Options

Despite the fact that syphilis testing is being done in healthcare facilities in Tanzania, it is important to consider following the right algorithm (Figure 1) for the right population of so as to reduce number of misdiagnoses hence adding efforts in reducing controlling syphilis. This will also provide evidence-based decision during patient management

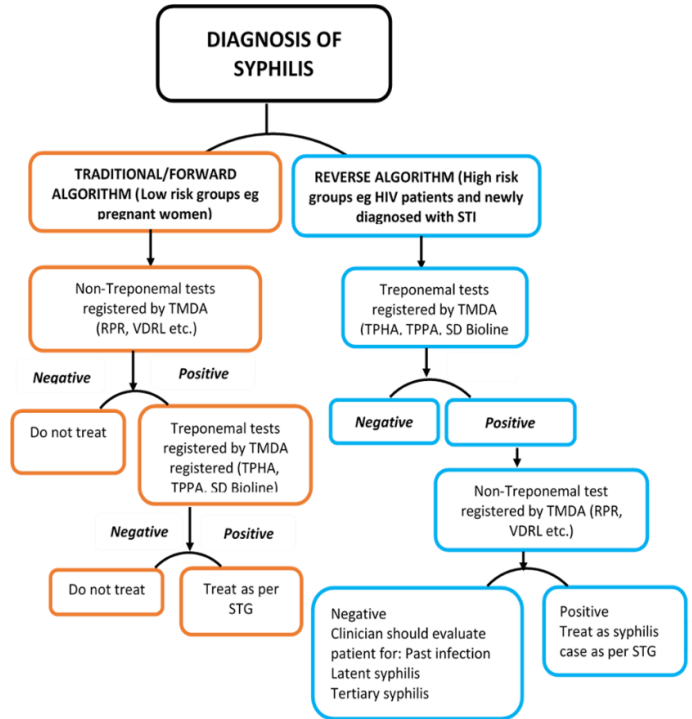


Fig 1. Forward and Reverse Algorithm for diagnosis of syphilis (CUHAS, 2021)

Implementation considerations

- i. Currently in Tanzania both Treponemal and non-Treponemal tests have been registered by TMDA and these tests have been used in different laboratories and health facilities in the diagnosis of syphilis with affordable costs. Therefore, the recommended policy option is feasible.
- ii. Point of care rapid tests that are available for screening and confirmation do not need high skilled personnel and expensive equipment, using existing routine

antenatal care services and CTC services, these infections can be screened and confirmed using either of the algorithms


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EPB04: Towards Improvement of Diagnosis and Patient Management of Urinary Tract Infection in Lower Health Facilities in Tanzania

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Key Messages

- Urinary tract infection (UTI) is among the most common conditions among both outpatients and inpatients.
- In Tanzania, UTI is most often among the first clinical diagnoses of cases presenting with fever among children below 12 years of age, pregnant women and patients with comorbidities.
- Culture is the gold standard in diagnosis of UTI despite its unavailability in resource limited settings.
- Urine dipstick when combined with clinical signs has accuracy of about 90% in detection of UTI
- This policy brief recommends the diagnostic algorithm which combine urine dipstick results and clinical signs in guiding appropriate management of UTI in lower health facility with limited culture services

Executive Summary

Urinary tract infection (UTI) is one of the most common complains among patients attending outpatient clinic worldwide. Globally, it affects four in every 10 children below 12 years of age and one in every four pregnant women. Urine culture is the gold standard method for diagnosis of UTI. However, in lower health facilities in Tanzania diagnosis is made by pus cell detection under the microscopy. Urine culture is currently the

standard diagnostic procedure for UTI in Tanzania. However, it is expensive, time consuming, require well equipped microbiology laboratory and skilled laboratory staff. For lower health facilities in Tanzania, UTI is mainly diagnosed by detection of pus cell in urine using microscopy technique, time consuming, require material and supplies for doing urine centrifugations and skilled laboratory staff. Urine dipstick which is cheap, easy to use and not requiring well equipped laboratory and skilled personnel has an accuracy rate of about 90% in detecting UTI. Here we propose diagnostic algorithm which combine the use clinical signs and urine dipstick results in management of patients with UTI in lower health facilities in Tanzania.

The Problem

Globally, urinary tract infection (UTI) affects about 4 in every 10 children aged 0-12 years, 2 in every 10 men, 3 in every 10 pregnant women and 4 in every 10 symptomatic patients (Bitew et al., 2017). In Tanzania, UTI is reported to affect about 2 in every 10 pregnant women (Seni et al., 2019; Chaula et al., 2017) and 2-3 in every 10 children (Mushi et al., 2019; Msaki et al., 2012; Festo et al., 2011) in Tanzania. With the declining of malaria prevalence and incidences, UTI is currently the most frequent diagnosis made among outpatient febrile cases in Tanzania. Recurrence UTI is reported to affect about 12-

30% of children per year (Desai et al., 2016). If UTI is not timely diagnosed and managed during pregnancy, it can lead to fetal and maternal complications such as preeclampsia, preterm labor, preterm rupture membrane, pyelonephritis, anemia, low birth weight, renal stones and urosepsis (Gilbert et al., 2013). Antimicrobials are usually the first line treatment for UTI. However, antimicrobial resistance among common pathogens causing UTI in Tanzania is high (32.4% for gentamicin; 100% for ampicillin and trimethoprim/sulphamethoxazole (Msaki et al., 2012, HATUA consortium data).

The World Health Organization (WHO) recommends a quantitative urine culture as the gold standard diagnosis of UTI. It is relatively expensive in terms of human resources and equipment (Hajar et al., 2011). In resource limited settings, urine dipstick is the most routinely performed diagnosis for UTI (Karah et al., 2020). It is reported to be useful in the diagnosis of UTI with different range of sensitivity depending on the parameters analyzed and the population (Devillé et al., 2004). Available statistics from HATUA consortium (Asiimwe et al., 2021) and other studies (Medina-Bombardó & Jover-Palmer, 2011) indicate that the use of urine dipstick in the diagnosis of UTI in symptomatic patients has improved diagnostic accuracy. Urine dipstick test when combined with UTI clinical symptoms is useful in ruling out UTI infection, and hence the unnecessary use of antibiotics. Additionally, urine dipstick analysis is cheap, easy to process in basic microbiology laboratory with short turnaround time and does not require skilled human resource (Chen et al., 2017).

In Tanzania, facilities for microbiology laboratory including culture and sensitivity are most often available in higher health

facilities (regional and zonal referral hospitals). UTI diagnosis at the primary health care facilities (dispensary, health centre and district hospitals), with unavailability of culture and sensitivity test service is mainly based on detection of pus cell in urine sediments. This technique is time consuming, require material and supplies for doing urine centrifugations and skilled laboratory staff. Furthermore, urine leucocytes structure is reported to be destroyed by centrifugation hence reduce the diagnosis accuracy (Kupelian et al., 2013). In Tanzania urine culture and sensitivity is estimated to cost Tanzania Shillings (TShs) 30,000-50,000 while urine dipstick costs TShs 3,000-5000 per test (MSD, 2019_2020). Additionally, the turnaround time from urine sample collection to release of results for culture and sensitivity in the laboratory is estimated to be 72-96 hours while for urine dipstick is 30-60 minutes. Thus, the use of dipstick in primary health care facilities is likely to significantly improve UTI diagnosis and reduce unnecessary use of antimicrobials and ultimately reduce antimicrobial resistance. The aim of this policy brief is to recommend for adoption of improved use of urine dipstick tests in the management of UTI in primary health care facilities in Tanzania.

Policy Options

This policy brief proposes the use of diagnostic algorithm (Flowchart 1-3)) which combine clinical signs and dipstick results in managing patients with UTI in lower health facilities in Tanzania in following categories:

1. To avoid unnecessary antibiotics prescription, clinicians at lower health facilities should consider the antibiotic treatment using standard treatment guidelines (STG) any pregnant women and adult patients with

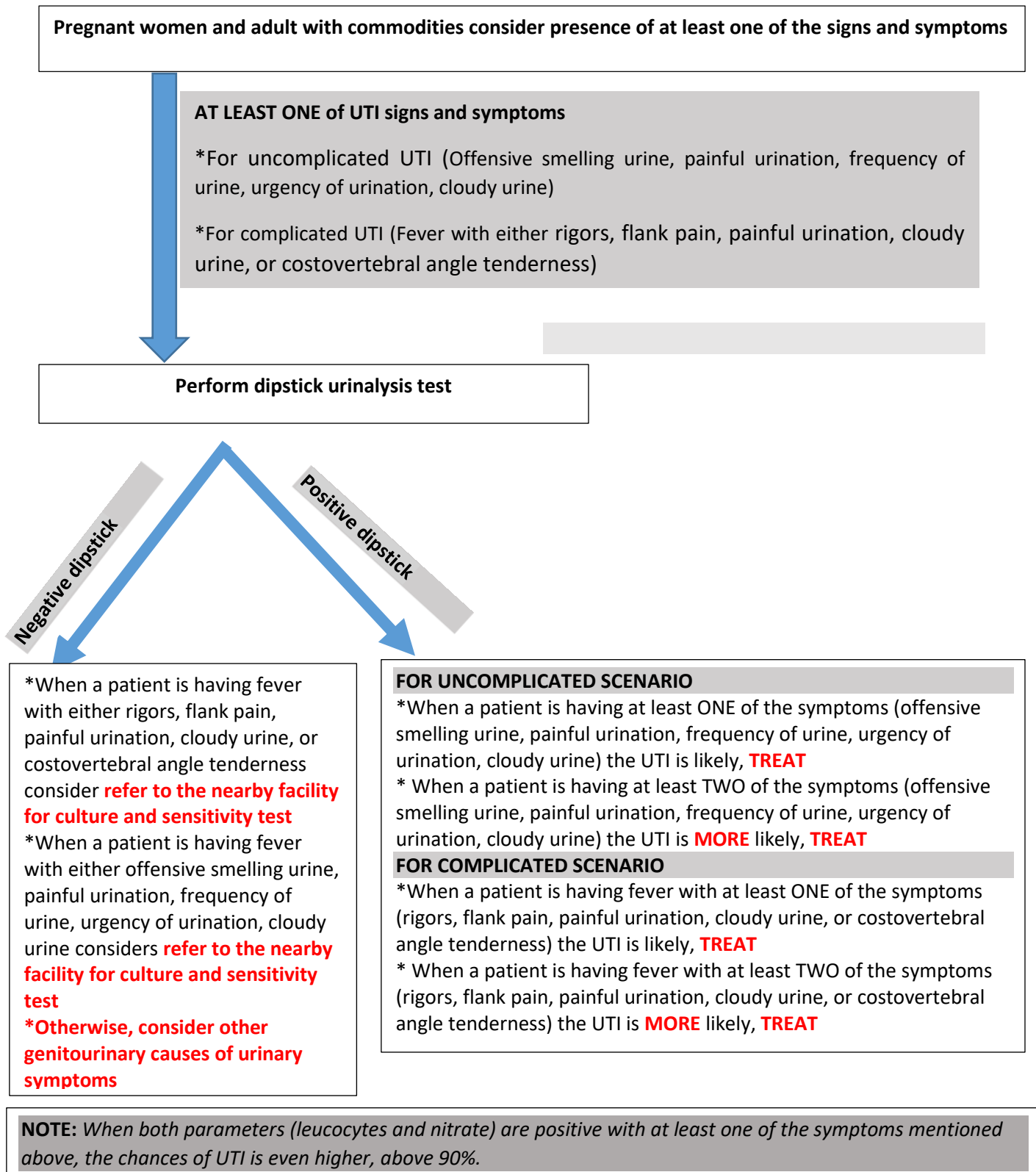
- comorbidities and UTI symptoms when dipstick results is 5 WBC and above
2. If the culture services are not available in a nearby hospitals, clinicians at lower health facilities should consider antibiotic treatment using STG for non-pregnant adult patients with positive urine dipstick of 70 WBC or more with any signs and symptoms of UTI
 3. To avoid unnecessary antibiotics prescription, clinicians at lower health facilities should consider antibiotic treatment using STG any child with positive urine dipstick of 15 WBC or more with signs and symptoms of UTI as judged by clinician
 4. Clinicians at lower health facilities should refer the patient for culture and sensitivity if recurrence/chronic UTI is diagnosed

Implementation Considerations

1. **Refresher training and orientation of new staff:** The Ministry of Health and President's Office Regional Administration and Local Government Authority should consider providing refresher trainings for all laboratory staff in primary care health facilities to equip them with the use of urine dipstick in UTI diagnosis. The training can be done through continuous professional development program.
2. **Sustainable supply of dipstick:** Due to the importance of appropriate antibiotic treatment, the management of lower health facilities should ensure sustainable stock of urine dipstick strips management using cost sharing funds to sustain supply dipsticks.

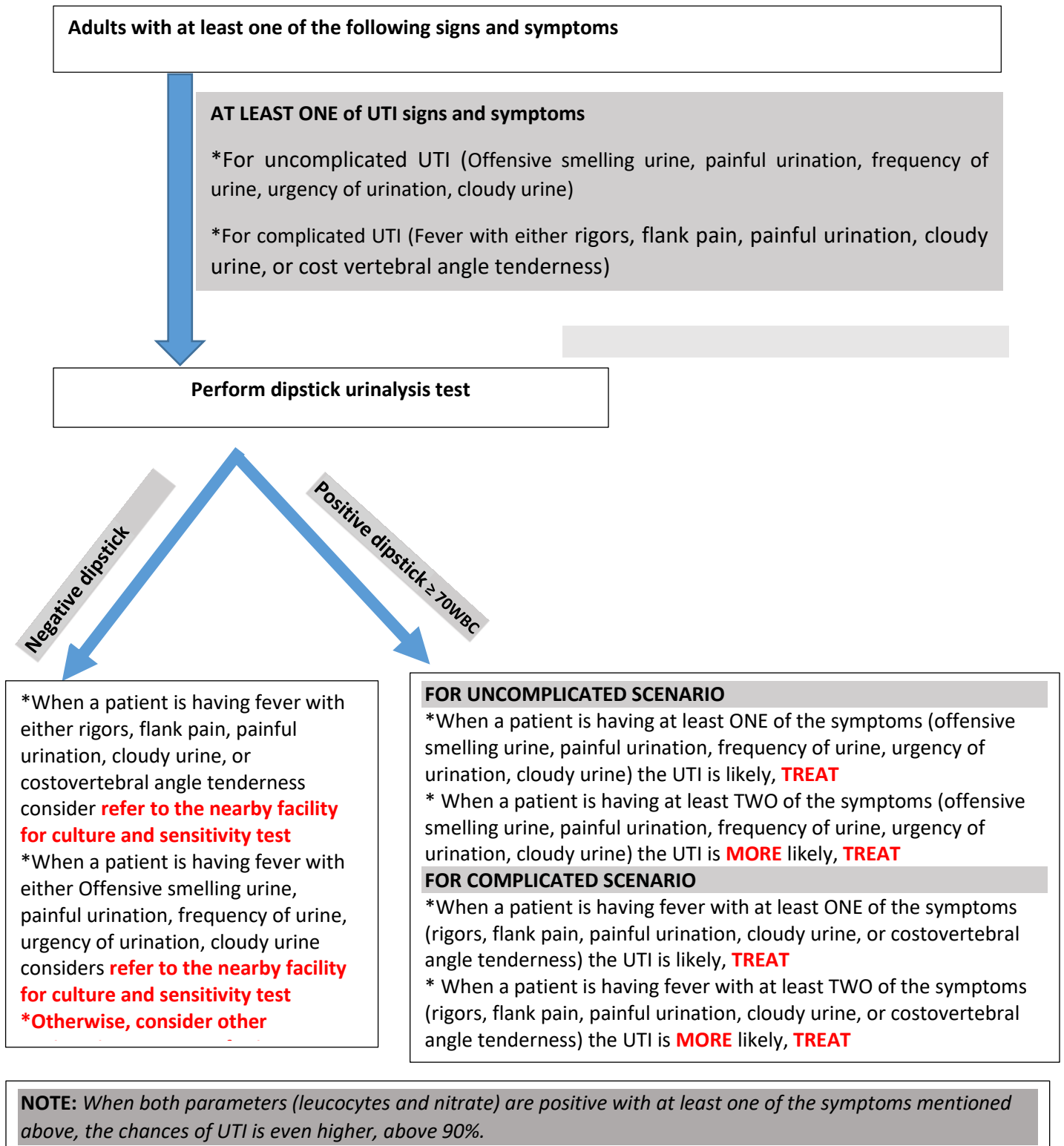
Flowchart 1: Pregnant women and adults with commodity suspected UTI

This excludes women with recurrent UTI who may need referral for culture test



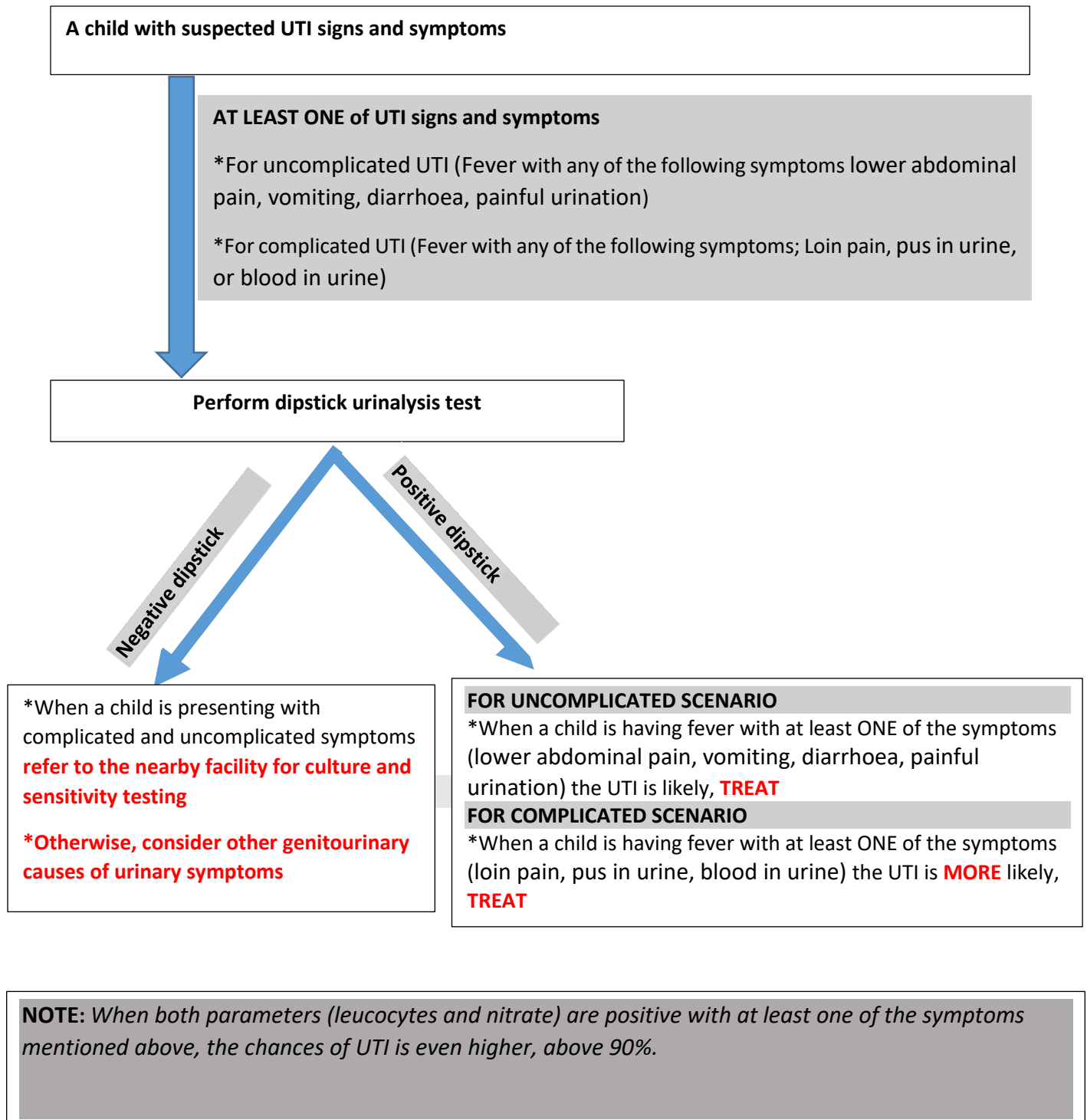
Flowchart 2: Adults with suspected UTI symptoms

This excludes adults with recurrent UTI who may need referral for culture test



Flowchart 3: Children with suspected UTI symptoms

This excludes a child with recurrent UTI who may need referral for culture test



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EPB05: Urgent Need to Address Antimicrobial Dispensing Practices by Drug Outlets in Tanzania

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Key Messages

- Antimicrobial resistance (AMR) is a global health threat. If no action is taken, it is projected to cause 10 million excess deaths by 2050.
- Antimicrobials are commonly dispensed without prescription and/or appropriate advice in many low- and middle-income countries, which pose a threat for emerging and spreading of AMR.
- Factors influencing antimicrobial dispensing practices customers pressure, Dispensers/owners in drug outlets need to ensure business survival and weak regulation enforcement.
- We recommend the following policy options: (i) promoting Antimicrobial Stewardship programme (ASP) as enshrined in the National Action Plan (NAP) on AMR 2017-2022 through awareness campaigns and (ii) Enforcement of the Pharmacy Act of 2011, and its Regulation of 2020.

Executive Summary

Antimicrobial resistance (AMR) is considered a significant threat to the public health systems throughout the world, infection with AMR leads to serious illnesses and prolonged hospital admissions, increases in healthcare costs, high costs in second-line drugs, and treatment failures. Inappropriate use of antimicrobials is one of the main drivers of AMR. Drug outlets (community pharmacies and Accredited Drug Dispensing Outlets (ADDOs)) are accessible first point of care

for patients seeking for common disease treatment and, crucially, antimicrobials provision. Studies conducted in Tanzania reported that 88.2%-92.3% of medicines dispensers dispensed antibiotics without prescriptions. There is a need for MoHCDEC to conduct awareness campaigns which will enhance behavioural changes of patients/customers, dispensers/owners. The strict regulatory enforcement of requirements for a prescription in the use of antimicrobials is badly needed. In order to monitor closely the conduct of drug dispensers, regulatory bodies need to pay regular and surprise supervisory visits to drug outlets despite the usual cry of limited resources (e.g., funds, time and logistics) to undertake such a crucial task of enforcing the regulations.

The Problem

Antimicrobial resistance (AMR) is a global health threat (O'Neill 2016; Haenssger et al. 2020). If no action is taken, it is projected to cause 10 million excess deaths by 2050 (O'Neill 2016). Worldwide, in both healthcare and community settings, resistance is increasing in bacteria that cause many common diseases and the World Health Organization (WHO) now lists antimicrobial resistance (AMR) as one of the top ten threats to global health (WHO 2017). AMR is considered a significant threat to the public health systems not just in developing countries but throughout the world, infection with AMR leads to serious illnesses and prolonged hospital admissions, increases in healthcare costs, high costs in second-line drugs, and treatment failures (Founou et al.

2017). Inappropriate use of antimicrobials is one of the main drivers of AMR (WHO 2020).

In developing countries, more than 80% of people when sick consult drug sellers and dispensers (WHO 2001; Miller & Goodman 2016). Moreover, drug outlets (community pharmacies and Accredited Drug Dispensing Outlets (ADDOs)) are accessible first point of care for patients seeking for common disease treatment and, crucially, antimicrobials provision (Kotwani et al. 2012). Despite prohibitive regulations, antimicrobials are commonly dispensed without prescription and/or appropriate advice in many low-and middle-income countries (LMICs), which pose a threat for emerging and spreading of AMR (Ocan et al. 2015; Minzi & Manyilizu. 2013; Adhikari et al. 2021; Bahta et al. 2020; Belachew et al. 2021). Furthermore, studies conducted in Tanzania reported that 88.2%-92.3% of medicines dispensers dispensed antibiotics without prescriptions (Horumpende et al. 2018; Ndaki et al. 2021).

Factors influencing antimicrobial dispensing practices are: i) patients/customers who demand antimicrobials without prescription at drug outlets due to time constraints, cost, and mild disease. Other factors are ease of access to drug outlets compared to other healthcare services, patients' trust in dispensers' knowledge, expertise and experience, misconceptions towards antibiotic use (ii) Dispensers/owners in drug outlets who contribute to the problem by their need to ensure business survival and iii) weak regulation enforcement (Alhomoud et al. 2018; Poyongo & Sangeda 2020; Kotwani et al. 2021).

Strict regulatory enforcement has greatly reduced the dispensing of illegal antimicrobials in other countries. For example, after the effective enforcement of a regulation and law enforcement on antibiotics sales, antibiotics dispensing rates without prescriptions were lowered in private pharmacies in Zimbabwe (Nyazema et al. 2007). The recent systematic review which included 15 studies were from 10 different countries in LMICs reported strategies employed to reduce non-prescription sales of antibiotics included law enforcement such as regular inspections by government regulatory authorities and media campaigns for the general public to enhance their

awareness on proper use of antimicrobials (Jacobs et al. 2019). This policy brief aims at addressing antimicrobial dispensing practices in drug outlets in Tanzania.

Policy Options

1. Considering inappropriate antimicrobial dispensing practices, we recommend the following policy options: (i) promoting Antimicrobial Stewardship programme (ASP) as enshrined in the National Action Plan (NAP) on AMR 2017-2022 through awareness campaigns (MoHCDEG 2017), and (ii) Enforcement of the Pharmacy Act of 2011, and its Regulation of 2020 (PURT 2011; Pharmacy Council 2020).
 - i. In this policy brief we are addressing the following three policy actors who in the course of their interactions influence antimicrobial dispensing practices i) Patients/customers, ii) Dispensers/owners, and iii) Regulatory authorities-The Ministry of Health, Community Development, Gender, Elderly, and Children (MoHCDEC), The Pharmacy Council (PC), Tanzania Medicines and Medical Devices Authority (TMDA), and President's Office Regional Administration and Local Government-PORALG.
 - ii. In the implementation of ASP there is a need for MoHCDEC to conduct awareness campaigns which will enhance behavioural changes of patients/customers, dispensers/owners. The public should change their attitudes towards demanding antibiotics without prescription and or incomplete courses. The attitudes of dispensers/owner should change from business orientation to patient-oriented services.
 - iii. Regulatory authorities through the MoHCDEC, PC, TMDA and PORALG needs to strictly enforce the requirements for prescriptions in the use of antimicrobials. The pharmacy (prescription handling and control)

regulations of 2020, section 3; (Pharmacy Council 2020); stipulates that: (1) A person shall not sell by retail or dispense prescription medicines unless the buyer produces a valid prescription prescribed by a qualified personnel after presentation of a legal prescription countersigned by relevant professional in accordance with these Regulations. (2) A person who contravenes sub-regulation (1) commits an offence and on conviction shall be liable to a fine of not less than five hundred thousand shillings but not exceeding five million shillings or imprisonment for term not exceeding twelve months or to both.

Implementation Considerations

In the implementation of ASP, we would like to advice the use of the following communication strategies which have been applied in malaria control interventions: print media (posters, fliers, newsletters and magazines), mass media (radio, televisions, social media and websites), education (Songs, drama, games, poem) and inter personal communication (health care provider to client) (NMCP 2015).

The following are important barriers in the implementation of ASP: Inadequate awareness and political will, Inadequate funding, Inadequate/lack of coordination across sectors and stakeholders, Inadequate/lack of monitoring and evaluation systems. To address barriers related to implementation of ASP, we recommend the following implementation strategies:

- i. Increasing awareness and political will through advocacy on ASP to politicians, decision makers, regional and districts leaders (Regional Administrative officers, Districts Executive directors, Regional Health Management Teams and District Health Management Teams).
- ii. To mobilize funds locally and through international agencies
- iii. Involve all sectors in the war against AMR and enhance coordination across sectors and stakeholders

iv. Enhance monitoring and evaluation system. The strict regulatory enforcement of requirements for a prescription in the use of antimicrobials is badly needed. It should be pointed out that the major barrier in realizing optimum antimicrobial dispensing practices in Tanzania is serious weaknesses in the implementation (e.g., poor enforcement of laws and regulations). Almost two-third of pharmacists confessed that they will stop dispensing antibiotics without prescription if there would be regular inspection by regulatory authorities (Poyongo & Sangeda. 2020).

In order to monitor closely the conduct of drug dispensers, regulatory bodies need to pay regular and surprise supervisory visits to drug outlets despite the usual cry of limited resources (e.g., funds, time and logistics) to undertake such a crucial task of enforcing the regulations. We would like to recommend the implementation of law enforcement to be rolled out in phases. Phase one during implementation should start in all Pharmacies and ADDOs located in urban (cities, municipalities, towns and centers of all districts). Phase two should be in peri-urban settlements, and the third phase in rural areas particularly in villages with access to health facilities (i.e., dispensaries etc).

The following are important barriers in the enforcement of pharmacy regulations: Weak supervision of inspection team within local government, insufficient human resources within the national regulatory agencies, inadequate supervision/inspection budget for supervisors and travel allowances. To address barriers related to weak regulation enforcement, we recommend the following implementation strategies. i) Pharmacists should not inspect within their councils. This can be done by mobilizing teams of official who will conduct supervisory visit at drug outlets from other regions and not from the same regions or districts in which they work/come from to avoid favoritism. Further, special inspection team should be deployed like ones used by MoHCDGEC during medicines audit in public hospitals. ii) To address shortage of health workforce we propose strengthening Pharmacy council zonal offices, employ more full-time pharmaceutical personnel in inspection unit. iii) To

address inadequate budget, fund obtained from premises registration and retention fees should be used to cover all supervision and inspection expenditures.

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EPB06: Invisible Poisons, Soil Eating Practices and Related Adverse Pregnancy Outcomes: An Emerging Silent Epidemic

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Key Messages

- Most women are not informed about the risk of soil eating practices and the content of the soil consumed remain undisclosed.
- Environmental pollution around the sources and processing sites are evident.
- Soil products known as soft stones/sticks, locally known as Pemba are commonly sold in public places without adhering to food selling procedures as per regulations
- The levels of toxic chemical elements of public health importance are above the recommended safety values.
- Beliefs, norms and unaware of alternative means for pregnancy related emotional and physical situations are the key drivers for soil eating practices.
- A consumer informed choice is vital: packaging and labelling policy should therefore include non-food edible materials such as pemba sticks.

Executive Summary

Exposure to toxic chemical elements through soil-eating practices is alarming yet salient public health issues in Tanzania are least known to the population. In addition to pregnant women, young children are disproportionately affected. Elevated levels of toxicants have been reported in studies involving pregnant women in Tanzania. Increased regulations, educational campaigns, informed choice among consumers, reviewing marketing strategies and continued research are therefore recommended. The objective this policy brief is bring to the attention of the policy makers and the general public on the need for consumer informed

choice on non-food edible materials during pregnancy, in this particular soil sticks called pemba by mandating labelling and packaging.

The Problem

Soil-eating practice is widespread among women, especially during pregnancy in Tanzania (Knudsen, 2001; Nyanza et al. 2014). Soil products known as soft stones/sticks, locally known as *Pemba* are commonly sold in public places without adhering to food selling procedures as per regulations. Exposure to toxic chemical elements such arsenic, lead, cadmium and mercury through soil eating practices is an under-explored yet salient issue in Tanzania. The World Health Organization (WHO) lists arsenic, lead, cadmium, and mercury as the most toxic chemical elements of public health concern (WHO-IPCS, 2010). They have been associated with significant morbidity and mortality in exposed adults and children (WHO-IPCS, 2010). Studies in Tanzania have documented significant exposure to such toxic chemical elements via soil eating practices (Nyanza et al. 2014; Msoffe et al. 2018).

Such toxic chemical elements do cross the placenta, and evidence suggests that the developing foetus is sensitive to their effects (WHO-IPCS, 2010). Exposure to such toxic chemical elements has been associated with adverse birth outcomes and severe developmental delays (Nyanza et al. 2020; 2021). The presence of toxic chemical elements in the soil eaten by pregnant women can severely damage the brain and kidneys, and may cause adverse pregnancy outcome (WHO-IPCS, 2010; Milton et al. 2017).

Apart from exposure to potentially harmful chemicals, pregnant women do consume up to 62.5 g/day (Nyanza et al. 2014); such an amount could be impairing digestion and absorption process in the gastrointestinal system. Some chemical elements may affect the gut prior to absorption. Iron is known to irritate the gut lining causing stomach and intestinal distress, such as cramping and constipation (Anderson, 2004). Meal components can interact with minerals and increase, decrease or delay nutrient absorption. Of more concern is that, pregnant women have been reported to perceive that soil-eating ensures a healthy pregnancy, reduce nausea and morning sickness, reducing prolonged labor, and connecting the unborn baby with ancestors for protection (Nyanza et al. 2014).

Recent studies in northern Tanzania, have reported high levels of prenatal toxic chemical elements among pregnant women up to 85.8, 38.2, 3.8, and 0.5 µg/L (at 95 percentile) for lead, arsenic, mercury, and cadmium respectively with a two-fold increase among those with pregnancy-related soil practices. An effect of chronic arsenic exposure to the children immune system during pregnancy has been associated with increased risks of infectious diseases in respiratory and gastrointestinal tracts (Mannan et al. 2018). Contrary to the given reasons, arsenic has been associated with nausea/vomiting and abdominal cramping in self-reported studies (Anderson, 2004). The presence of soil sticks sold openly, and the documented levels above the safe limits pose a risk to consumers and their offspring. These among other drivers call for immediate action for policy change.

Policy Recommendations

- i. Untested substances which are not considered to be normal foods eaten by pregnant women should not be presumed to be safe. Producers should be empowered and where possible assisted by the respective government authorities to test the toxicity and/chemical contents of edible soil so as consumers are well informed on their choices. The Food Labelling Regulations 2006 (38) and the Tanzania Food, Drugs and Cosmetics Act

2015; requires all pre-prepared packaged foods and drinks manufactured, processed, pre-packed or packed in Tanzania must clearly display food labels and food content on the pack. Move this to implementation considerations!

- ii. There is a need to strengthen education programs on measures to reduce toxic chemicals exposure in these communities. For instance, the reason for soil eating practice such as to reduce nausea from morning sickness associated with pregnancy among other things could be addressed and alternative solutions could be provided. What are these alternatives?
- iii. Incorporate nutrition education on soil eating into school curriculum because teenagers have been reported to indulge in the practice and they are the mothers of tomorrow (Not shown in the Problem).
- iv. Sales of soft stone/sticks (popularly known as *Pemba*) should be regulated to protect the consumer's health Prohibiting vending *Pemba* stones openly amongst other food items. The selling of *Pemba* soft stones should be accompanied by special packaging with appropriate health key messages as per the Tanzania Food, Drugs and Cosmetics Act 2015 requirements.

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EPB07: High Burden of Elevated Blood Pressure (EBP) among adolescent and adult in Tanzania: Time for Action

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Key Messages

- The burden of Elevated Blood Pressure has been constantly rising over the years both globally and in Tanzania.
- Hypertension is a silent killer; most people do not know they have it.
- Hypertension is non-curable but can be controlled and preventable.
- Screening for and treating of Hypertension is the main focus of management as one among Non-Communicable Diseases in the country, but more needs to be done to address their risk factors.
- Data and surveillance systems for Hypertension need to be strengthened.
- Strengthening of Health Facility on Hypertension in term of skilled man power and equipment on screening and treatment.

Executive Summary

Elevated Blood Pressure is now a global growing burden, including Africa and in low-income countries like Tanzania. The burden constitutes one of the major challenges to socioeconomic development as it causes a big burden to both the economy and to the health care systems. Despite the increasing burden of Elevated Blood Pressure there are still inadequate response in their prevention and control measures. The current approach which is mainly centred within health facility with community involvement in reducing the burden as per 2016-2020 National Strategic and Action Plan for The Prevention and Control Non-Communicable Diseases focus on risk groups only. More regular tailor-made interventions community based on education about NCDs risk factors, identifying people who are unaware of their status, improvement of linkage to care,

strengthening of Monitoring and Evaluation system are recommended.

The Problem

The burden of Elevated Blood Pressure has remained high in Tanzania despite the effort made to control. The current prevalence ranges from 10% - 41% and affecting a range of age groups from Adolescents to elderly, Table 1 below. An increasing number of people with elevated blood pressure in Tanzania has been observed in previous studies (Mayige et al., 2013; Isangula et al., 2017; Muhihi et al., 2020), it is clear that this disease is prevalent throughout the country and it is among the leading cause of disability and death (Peck et al., 2013, Matuja et al., 2020). If elevated blood pressure is untreated it may result into a range of life-threatening complications like heart failure, loss of vision, kidney diseases and stroke which studies shows that it may occur at a young age.

There are ranges of factors which have been reported in studies to contribute to high burden/magnitude of EPB, these are health system factors like (inadequate training on h EPB management to staff, lack of guidelines, basic diagnostic equipment and basic antihypertensive medications. Unhealthy eating habits; Excess alcohol consumption Tobacco use and sedentary life style (Muhihi et al., 2020, Hamid et al., 2019).

In Low- and Mid-Income countries, the high burden of unaware EPB indicates unresponsive primary health care services among others factors (Haque et al., 2020). Evidence from studies in Tanzania show that there are no enough guidelines, inadequate skills and unavailability of medical equipment necessary for screening of blood pressure at primary health facilities (Peck et

al., 2014; Bintabara et al., 2018). It has already been shown that strengthening of primary health care services with a linkage to community-based screening programs is likely significantly reduce the rate of undiagnosed EPB and its complications (Sahli et al., 2016). If the situation will continue as it is without an immediate preventive intervention, the country will use a lot of funds to treat EPB and its associated complications. The premature deaths caused by the disease may be a burden to the country as it causes a serious loss of workforce. Therefore, urgent tailored interventions are needed to contain this situation.

Table 1: Prevalence of EPB in Tanzania

Area	Prevalence (Overall)	Prevalence (Unaware)	Age	Type of study	Reference
Dar es Salaam and Kilimanjaro	30%		Adolescents and Adult	Community	Edwards et al., 2000
Dar-es-Salaam	23.1%		Adult	Community	Guwatudde et al., 2015
Dar-es-Salaam	37%		Adult	Community	Zack et al., 2016
Kilimanjaro	28.0%		Adults	Community	Galson et al., 2017
Kilimanjaro	34.3%		Adult	Hospital	Hertz et al., 2019
Mwanza (Tanzania) and Kampala (Uganda)	40%		Adolescents and Adult	Community	Nsanya et al., 2019
Morogoro	29.3%	19.2%	Adult	Community	Muhihi et al., 2020
Mwanza	10.2%		Adolescent	Community	Nsanya et al., 2021

Policy Options

Based on the currently NCD National Strategic Plan 2016 – 2020 the following action area are recommended as far as EPB concern; -

1. Integrate NCD services into existing health care services at all levels of care including community participation. Towards proving early detection and treatment of HTN availability of screening commodities, guideline, drugs as well as skilled human resource is key. Lack of these resources may lead to underperformance of integration of NCD Services particularly at primary level. Recently published studies show there are still inadequate screening and treatment practices at primary level (Bintabara et al., 2020).
2. Reduce modifiable NCD risk factors and create health promoting environment. Despite the intention of creating awareness to the general population of NCD control program, large proportional

of Tanzanians they still do not know the risk factors for NCD. This situation can lead to an increase the number of preventable cases of NCDs including HTN (Muhihi et al., 2020)

Policy Recommendations

1. Integration of EPB service into routine care should go in parallel with a proper referral system for the identified cases, follow up and maximize treatment outcome retention. While strengthening the integration of the EPB services with other routine services, screening of all age groups including adolescent, young adult and elderly is recommended.
2. Establish clear Monitoring & Evaluation systems to track EPB indicators for policy formulation and evaluate progress at the national, regional, district, primary health facilities and community level.
3. Enhance health promotion programs targeting such areas as regular screening, healthy diets and lifestyles using a variety of public channels and media.
4. Enhance use of school health policy on early detection and health promotion with regard to EPB.
5. Strengthening community out reach program for EPB screening by integrating with other routine primary health care services.

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EPB08: Re-focusing on preventive and control measures to reduce bloodstream infections in newborns in Tanzania

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Key Messages

- Blood stream infections are common in low- and middle-income countries, and they accounts for 13 deaths in every 100 newborns in Tanzania.
- These deaths are two times higher among newborns infected with bacteria resistant to multiple antibiotics.
- Comprehensive management of BSI among newborns cost more than Tsh. 100,000/- per newborn.
- Proper implementation of simple, affordable and cheaper infection prevention and control measures are recommended to reduce BSI, associated negative impacts and cost.

Executive Summary

Blood stream infections are common across the world and affect more newborns compared to other age-groups. These infections are currently challenged by existence of bacteria which are resistant to multiple antibiotics, making management more complicated. The Ministry of Health Community Development, Gender, Elderly and Children in Tanzania has reported that the burden of BSI in children has shifted and newborns are currently at increased risk of not only acquiring, but also suffering from negative consequences related to these infections. Because newborns' immunity to BSI and many other infections is still developing, and because standard management (which includes culture and antimicrobial susceptibility testing, many laboratory tests, antimicrobials and other supportive management) are costly, preventive

measures are said to be key in combating BSI in low and middle income countries like Tanzania. Here we propose a cost-effective infection preventive and control (IPC) measure model supported by preliminary evidence-based data generated locally to reduce the burden of BSI so that existing limited resources are appropriately used for the betterment of the newborns, communities and health systems in Tanzania.

The Problem

Globally, 1.3 to 3.9 million cases of BSI occur annually among newborns resulting into 400,000 to 700,000 deaths (BSI accounts for 15% of all causes of deaths in newborns). About 30-50% of these infections are acquired in the hospitals, and over three quarters are preventable (Gezmu et al., 2021; WHO, 2020). Infections due to bacteria resistant to multiple drugs is projected to be the leading cause of deaths worldwide by 2050, and will kill over 10 million people and cost 100 trillion USD annually (O'Neill, 2018). Blood stream infections (BSI) is associated with high number of newborn deaths in low- and middle-income countries (LMICs) than higher income countries (HICs) (Bhutta et al., 2010; Kayange et al., 2010; Mhada et al., 2012).

In sub-Saharan Africa, BSI in newborns range between 3.5 and 12.1/1000 patient-days. The majority of bacteria causing BSI are resistant to multiple drugs (Gezmu et al., 2021).

In Tanzania, BSI prevalence in newborns ranges from 24% to 50%. The BSI case notification has been higher in tertiary hospitals compared to lower-level hospitals, and differences are

associated with availability of expertise and diagnostic infrastructures in the tertiary hospitals (Kayange et al., 2010; Mhada et al., 2012; Seni et al., 2019). Out of every five newborns with BSI, 1 die (Kayange et al., 2010; Marando et al., 2018). Death is also two times higher among newborns infected with bacteria resistant to multiple drugs (Kayange et al., 2010; Mhada et al., 2012).

Newborns develop BSI from normal bacteria on skin and digestive system, or from contaminated hospital environment and medical equipment, and can also get BSI from other hospitalized newborns who are infected (Silago et al., 2020; WHO, 2002). Transmission is common in critical care units compared to other units/wards. Studies in Mwanza have shown that 1 out of 3 environmental samples, 1 out of 3 newborn beds, 2 out of 10 hands of newborn mothers, and 8 out of 100 clinical coats of health care workers are contaminated with bacteria resistant to multiple drugs (Marando et al., 2018; Moremi et al., 2019; Silago et al., 2018; Silago et al., 2020).

Tanzania has made significant reduction in deaths among children <5 years of age, however, reduction has been not significant in the newborns' group, where BSI is the third leading cause of deaths. This calls for re-focusing on preventive and control measures towards the newborns' age-group. Because, comprehensive treatment of BSI requires long hospital stay and very expensive costing more than Tsh. 100,000/- per newborn with BSI compared to less than Tsh. 20,000/- per newborn without BSI. For example, at Bugando Medical Centre only, nearly 3,000 newborns are admitted in newborn wards/units with almost 60% due to BSI costing more than Tsh. 180 million for comprehensive management of BSI in newborns annually. The cost may be more than what is stated here as the newborns can be admitted several times during the first 28 days of life.

Prevention of BSI is therefore a priority in the efforts to reduce cost and associated BSI burden. Different studies are reporting that hand hygiene, and cleaning of hospital environment and medical equipment are the top most effective IPC measures to reduce emergence and spreading of bacteria resistant to multiple drugs (Strich et al., 2017; Ted Schettler, 2016). One of the major problems is poor

hand hygiene compliance, lack of systematic environmental premises decontamination and lack of surveillance systems especially in the lower level of health care facilities. Studies across 95 countries and in Tanzania are showing hand hygiene compliance among health care workers to be 40% and <6%, respectively. Both, individual-and-institutional factors can hinder effective hand hygiene compliance (Erasmus et al., 2010; Wiedenmayer et al., 2020). Despite that the two broad categories were also highlighted in the situational analysis on IPC in Tanzania and were critical gaps identified in the current National IPC Guidelines conducted in Tanzania, information on IPC to prevent BSI in newborns was lesser emphasized (MoHCDGEC, 2018). The most common individual factors are related to individuals' behavior, attitude and practices which results into lack of adherence to the IPC guidelines; institutional factors are related to IPC materials stock-outs due to financial constraints and newborns' wards/units congestion which do not adhere to the recommended distance of at least 2.4 meters between newborns' bed to bed, and lack of adherence to the principle of "One bed to One newborn" (White et al., 2013). Therefore, addressing these hindering factors using simple, inclusive and cost-effective platforms are urgently needed to reduce BSI and its associated negative impacts.

Evidence from Taiwan report that using the WHO multimodal strategy increased hand hygiene compliance among HCWs from 62.3% to 73.3%, decreased infections from 3.7% to 3.1% and saved \$940,000 which would otherwise be used for treating infections per year (Chen et al., 2016; WHO, 2002, 2019; Torio et al., 2016). A review of 38 studies across countries showed maternal handwashing reduced deaths by 44% and infections by 24% (Blencowe et al., 2011). Available preliminary data in Tanzania indicate that there was significant reduction of number of resistant bacteria in the environmental premises after refurbishment of the newborn wards, improved hand hygiene among neonates' mothers and enhanced IPC advocacy measures at Bugando Medical Centre, which in turn reduced

antimicrobial resistant bacteria causing BSI and deaths (SNAP Consortium Data., 2021).

Policy Options

- Identify and engage IPC champions in each health care facility: A need to identify IPC champions in the newborns' wards (doctors, nurses, medical attendants and neonates' mothers/caretakers) and monthly awarding them certificates of recognition and posting their pictures in the neonatal wards. This will reinforce change in attitudes and practices to others, and thereby, fostering IPC responsive measures to be every-one's responsibility.
- Establish a twinning programme between healthcare facilities: We are recommending a novel twinning program whereby IPC experts from the MoHCDGEC, tertiary and regional hospitals will provide supportive mentorship (physically and virtually) to staffs involved in IPC in the lower health care facilities (dispensaries, health centers and district hospitals), and monitor BSI trends within and across health care facilities.
- Resource mobilization and availability: We recommend hospital managements' commitment and buy-in to ensure uninterrupted supply of IPC materials through setting up a dedicated budget for IPC implementational activities every year. For example, disinfectants and antiseptics, plastic shoes (for mothers and HCWs), breastfeeding gowns (for mothers), gloves (for HCWs), sterilized newborns' gowns, sterilized bed-sheets and waterproof mattresses which can be decontaminated. The hospital IPC committee should monthly report the IPC materials consumption, the trend of hand hygiene compliance, and the frequency of environmental decontamination against burden of BSI due to multiple drug resistant bacteria in their respective hospitals. This will enable early notifications of outbreaks of BSI due to resistant bacteria for promptly response.
- Provide adequate infrastructure for newborn wards/units: Expansion of the neonatal wards and neonatal ICUs (spacing and equipment

i.e., beds) to match with the increasing number of neonates admitted should be an area for prioritization in the institutional and country's plans.

Implementation Considerations

The proposed IPC responsive measures against BSI are in line with the three strategic objectives in the Tanzania National Action Plan on AMR (2018 – 2022) namely IPC, Research & Surveillance, and Antimicrobial stewardship (Tanzania, 2017). Therefore, this ensures that there is buy-in to the proposed policy brief by government, local and global AMR stake holders. However, the following issues need to be critically addressed:

- Considering the fact that most of these IPC measures involving behavioral changes, implementations of these policy options are feasible and within the capacity of Tanzania health system. However, individuals and institutional commitment is highly needed to achieve BSI reduction among newborns.
- Currently, there are ongoing structured supportive supervision between tertiary and regional hospitals to district hospital, health centers and dispensaries in areas such as immunization, emergency obstetric care and vertical program like HIV/AIDS and tuberculosis. Therefore, the proposed IPC twinning program will be feasible as it will be within the existing structures.
- Although Tanzania, just like other LMICs is faced with financial challenges, the long-term solution to combat BSI among newborns is to adhere to the international standards for neonatal units/wards such as maintaining a neonate to cot ratio of 1:1 and a distance of at least 2.4 meters between centre to center of neonate cots.

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Preamble to the CUHAS - BMC list of publications



In the past two years, despite a raging pandemic, CUHAS/BMC's scientists have published over 200 publications in peer-reviewed journals. The topics investigated and documented cover the following research fields: 32% investigate Infectious Diseases and Antimicrobial Resistance, 30% cover Non-Communicable Diseases (with a third of those dedicated to Oncology), 15% examine issues pertaining to Health Systems and Health Care Delivery, 12% explored Mother and Child Health and the remaining works concerned Social Determinants of Health, Laboratory Procedures, Vectors and Histopathology.

Though the predominance of the output remains geared towards infectious diseases, we notice an increase in the study of non-communicable diseases and their prevention.

The quality of research output produced at CUHAS/BMC has been recognized at national and international forums and has remained high despite the challenges encountered during the past two years.

Developing research capacity is at the core of CUHAS/BMC priorities and has been made possible by various training initiatives and programmes, such as the Medical Education Partnership Initiative (MEPI) in collaboration with Weill Cornell Medical College to train future leaders of health care academics, research and policy in Tanzania; we also recognize our scientific partners from other universities, in particular our German partners from Wuerzburg and all our partners in AMR research. CUHAS/BMC and partners aim at building a scientific community, producing research-based evidence allowing medical professionals to better serve the communities which surround them and improve the delivery of health services and care to the patients. It has never been so clear after this trying period how important these partners are for our institutions and how much we benefit from the creativity and stimulation of scientific exchange.

Prof. Domenica Morona

Director Research and Innovations

PUBLICATIONS OUTPUT 2020 & 2021

1. PUBLICATION OUTPUT 2021
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