



15th Annual Research Dissemination Conference

22nd November 2019

Igongo Cultural Centre, Mbarara

Book of Abstracts

WELCOME REMARKS FROM THE CHAIR, CONFERENCE ORGANISING COMMITTEE



The Chief Guest, Vice Chancellor, Keynote Speaker, Guest Speakers, Members of University Council and Senate, Officers of the University and Top Management, Civic and Religious leaders present, University Collaborators, Members of the Mbarara University of Science and Technology (MUST) community, Distinguished participants, Ladies and Gentlemen.

On behalf of the Organizing committee, it is a pleasure to welcome you to this important event, as we once again congregate to share a full year research harvest at MUST and beyond. The theme for the 15th MUST Annual Research Dissemination Conference (ARDC), is **“Collaborative Transformational Research for Sustainable Community Development”**. We have received high quality abstracts and the majority submitted by MUST staff, which is a testimony of a thriving academic community. We also recognise and welcome participants and presenters from other institutions. I can confidently promise you an enriching academic menu at this conference.

Preceding this conference, there have been a number of events. The other day, we had a cleaning exercise and repainting of Zebra crossings, and a visit to a Special Needs School in Mbarara town, to demonstrate our social responsibility to the Community. Allow me to thank management of Mbarara Municipal Council and Uganda National Roads Authority for partnering with us. Yesterday we held the now Annual PhD symposium where PhD candidates presented their research progress.

We thank the Honourable Minister of Science, Technology and Innovation Hon. Dr. Elioda Tumwesigye, for accepting to be our Chief Guest. MUST continues to benefit a lot from the unwavering support the Minister has given this University.

We are further joined today by our esteemed Key Note Speaker Professor Charles Kwesiga, the Executive Director of Uganda Industrial Research Institute, which is a lead Agency for research, innovation and industrialization in Uganda. We are also honored by the presence of a Special Needs and Rehabilitation Expert Dr. Lawrence Eron, as we launch the MUST Special Needs and Disability Policy alongside the proceedings of this conference.

I would like to use this opportunity to thank the University Council, the Vice Chancellor Professor Celestino Obua, Management, and MUST Staff in general for their continued support to enable this conference to be held on an annual basis for the last 15 years in a

row. Additionally, co-sponsorship from MGH Global Health, Epicenter, UCSF (DIPT and ADEPTT), MUST Special Needs Project through ADB, PHARMBIOTRAC, HCU, Mbarara Municipal Council, among others is hereby appreciated.

I express gratitude to the Director and Members of the Board of DRGT for hosting this conference. I congratulate the Board for hosting this conference for the second time, and in fulfilling the mandate assigned to us by the University Management, to organize and the coordinate the MUST ARDC conference. As a Board we are committed to ensure that research at MUST is well coordinated, and that research inputs and outputs are efficiently managed and utilized for mentorship, capacity building, community service and other expected outcomes.

Special gratitude to the Organizing Committee for their tireless efforts to make this conference successful. I appreciate your expertise, professionalism, commitment and patriotism to this important event.

Our service providers; Igongo Cultural Centre, media houses present, and exhibitors, I thank you.

Once again I warmly welcome you all today and look forward to an engaging participation at this ARDC, 2019.

SUCCEED WE MUST

Professor Amon G. Agaba MBChB, PhD

Chair 15th MUST ARDC 2019

Chair DRGT Board

SPEECH BY THE DIRECTOR, DIRECTORATE OF RESEARCH AND GRADUATE STUDIES, AT THE 15th MUST ARDC 2019.

The Chief Guest and Minister of Science, Technology and Innovation, Hon. Dr. Elloda Tumwesigye; the Keynote Speaker, the Guest Speaker, Council & Senate Members here present, the Vice Chancellor; Deputy Vice Chancellors; Members of the DRGT Board; our partners here present; Fellow Academicians, Presenters, Distinguished Ladies and Gentlemen. I want to welcome you to this 15th MUST Annual Research Dissemination Conference.



Allow me to first commend the Organizing Committee that is also the Board of the Directorate of Research and Graduate Training together with the Procurement Unit of the University and stakeholders for organizing this great Conference in this beautiful venue of Igongo Cultural Center. Thank you very much.

This is the second time in a row for the Directorate to be in the lead of organizing this conference. Special thanks go to the Chief Guest, Hon. Dr. Elioda Tumwesigye the Minister of Science, Technology and Innovations again for honouring our invitation. The Keynote Speaker today, Prof. Charles Kwesiga from Uganda Industrial Research Institute, the Guest Speaker Dr. Eron Lawrence from Kyambogo University and to the co-sponsors, you are very special to us and I thank you very much. To the researchers, thank you for submitting your work and accepting to be here today.

Special thanks to the University Council for approving the first ever Research Policy as developed and presented by the Directorate in this great institution. As we shared on MUST mail, the Research Policy was approved this year 2019 by the 74th Meeting of the University Council. I am indebted to the Board, Top Management and Senate for your guidance in developing and finalizing the Research Policy.

The academic staff as research supervisors have continued to guide the graduate students in conducting outstanding research. Just last month of October 26th we witnessed 11 Doctoral students, 178 Masters Students and 3 Postgraduate Diploma graduands walking away with their new qualifications. As you saw last month, the Directorate again produced the Graduate Abstracts Books, a trend we started last year. We pledge to maintain the momentum of producing these Abstracts Books at graduation annually, while adding in new flavour including programs offered as well as the fees structure for potential applicants to ably make informed decisions. I have noted that even today, some graduates are here to present their research. I want to continue encouraging you supervisors to proceed with publishing the research together with first author being the student.

As a strategy of improving the quality of research for both Faculty and students, we are in the process of acquiring Turnitin Antiplagiarism software License this Financial Year. This is the first time for this institution to own Antiplagiarism software License.

I also thank you researchers for the trust you have in MUST Grants Office (MGO) to manage your projects. However, I appeal to you to engage MGO as soon as you start writing your proposals because Research Administration is very critical. At MGO, projects are allocated to individual staff for reporting purposes. In view of this, the MGO staff reporting for the project should be considered among the Direct costs more especially where MUST is the prime recipient.

Distinguished Ladies and Gentlemen, I am hopeful that at the end of this conference whose theme is “**Collaborative Transformational Research for Sustainable Community Development**” will have captured our current issues and suggesting answers or identifying gaps for future research.

Once again, I welcome you all and thank each one of those that have supported us in preparing to host this conference. May this conference be a seed to further education, networking and building stronger collaborations that enable us to leverage the benefits of research so that this day may remain memorable to everyone attending this 15th Annual Research Dissemination Conference at MUST. Our goal is to strengthen research and innovation uptake to make a significant contribution in transformational and sustainable community development.

Succeed we MUST

Assoc. Prof. Batwala Vincent MBChB, MPH, PhD

Director, Directorate of Research and Graduate Training (DRGT)

PROFESSOR CELESTINO OBUA, VICE CHANCELLOR MBARARA UNIVERSITY OF SCIENCE AND TECHNOLOGY



Prof. Celestino Obua MD, MSc, PhD; is the Vice Chancellor of Mbarara University of Science and Technology and a Professor of Pharmacology and Therapeutics. He holds a PhD in Pharmacology and a Fellow of the Uganda National Academy of Sciences (FUNAS). He is the Program Director of the Mbarara University Research Training Initiative (MURTI), a program that has trained to date four cohorts of junior faculty at MUST in conducting research in HIV/AIDs and related morbidities. He is also the Program Director of two other programs at MUST i) The Mbarara University Alzheimer's and Related Dementia Research Initiative (MADRI), a program that has built capacity of 12 junior faculty to conduct research in dementia ii) HEPI-TUITAH program that is spearheading skilling of undergraduate health professional students at Mbarara, Lira and Bishop Stuart Universities. He was an investigator in the MEPI-MESAU consortium project that involved five medical schools in Uganda, during which he oversaw the implementation of the trans-disciplinary mentored research across the consortium

institutions. He has mentored and provided leadership in several research projects on drug use studies at community levels and in the health facilities, pharmacodynamics and ARVs, health systems and higher education, with over 60 publications, having supervised 28 graduate students including 10 PhDs.

HONORABLE DR. ELIODA TUMWESIGYE, GUEST OF HONOR 15th MUST ARDC 2019



Hon. Dr. Elioda Tumwesigye MBChB, MSc; is a Ugandan politician, physician, and epidemiologist who has served as Minister of Science, Technology and Innovation in the cabinet of Uganda since June 2016. He will in history be known as the first Minister to lead Uganda's Ministry of Science, Technology and Innovation when it was founded in June 2016. From 25 July 2013 to 28 February 2015, he served as State Minister for Health (General duties). He was promoted to Minister of Health on 1 March 2015.

Hon. Tumwesigye has been the elected Member of Parliament representing Sheema Municipality in Sheema District, since 2018. In 2001, he contested the parliamentary seat of Sheema County North, in Sheema District, on the National Resistance Movement political party ticket. He won and was re-elected in 2006 and 2011.

He attended Ntare School for his O-Level education and for his A-Level studies where he was elected Head Boy, and in 1984 he was rated the third best performing student in the country. He obtained a Bachelor of Medicine and Bachelor of Surgery degree from Makerere University in 1990. While attending Makerere, he started the Sheema University Student's Association, which was still active as of March 2015. He was also elected Health secretary of University Hall, a men's hall of residence at Makerere. From 1990 until 2001, he worked as a Medical Officer at the Uganda Ministry of Health, serving in the Epidemiology Studies Unit during the last four years.

In 1997, he obtained a Master of Science in Epidemiology from Case Western Reserve University. When Hon. Tumwesigye returned from Case Western Reserve University, he established Kabwohe Clinical Research Center (KCRC), which has grown to be one of the premier research centers in the country, providing health care to thousands of HIV/AIDS patients, with support from PEPFAR and other partners.

DR. LAWRENCE ERON GUEST SPEAKER AT THE 15th MUST ARDC 2019



Dr. Lawrence Eron, BDS, MNSE, PhD; is a Senior Lecturer in Special Needs and Inclusive Education at Kyambogo University. He is currently the Dean of the Faculty of Special Needs and Rehabilitation, a position he has held from 1998 at the time it was Uganda National Institute of Special Education up to 2009 and he is serving another term that started in 2015 to date. For the last 23 years, Dr. Eron has been involved in teacher education and training of Community Based Rehabilitation workers, sign language interpreters and mobility and rehabilitation workers or requisite skills to work with persons with disabilities. He has worked closely with Disabled Peoples' Organisations to train Persons with Disabilities with skills that improve their quality of life. Dr. Eron publications focus on higher education, disability inclusion, in-service teacher development and accessibility.

In addition to lecturing and administration, Dr. Eron spearheaded the customisation of the National Policy on Disability into development of the firsts Kyambogo University policy on Disability. He is responsible to ensure the implementation for the policy which was approved especially the establishment of the Disability Support Centre. He has initiated and coordinated development projects aimed at improving quality, equity and inclusiveness in education and disability. Among the projects is the community based approach to inclusive education, human resource development for inclusive schools in Primary Teacher Colleges and currently involved in African higher education leadership in advancing inclusive innovation for development.

PROFESSOR PROF. JOHN CHINYERE AGUIYI GUEST SPEAKER AT THE 15TH MUST ARDC 2019



Prof. John Chinyere Aguiyi, Dean Faculty of Pharmaceutical Sciences and Project Director Africa Centre of Excellence in Phytomedicine Research and Development (ACEPRD) University of Jos, Plateau State NIGERIA, Chairperson, PHARMBIOTRAC International Scientific Technical Advisory Board (ISTAB).

POFESSOR CHARLES KWESIGA, KEY NOTE SPEAKER AT MUST 15th ARDC 2019



Prof Charles Kwesiga (PhD Chemical Engineering, University College of London), is the Executive Director of Uganda Industrial Research Institute (UIRI).

An Industrial Engineer by profession, Charles Kwesiga has significant experience as a corporate manager, management consultant, educator, and entrepreneur.

As Executive Director he oversees the Institute's activities that include: technology transfer; technology diffusion; process and product development; business incubation; contract engineering services and applied R&D.

Highly regarded by his peers and other professionals, Professor Kwesiga's other extra-curricular activities include the following:

President of WAITRO (World Association of Industrial and Technological Research Organisations), an association of 160 member institutions from 70 countries. **President from Jan 2015 to Dec 2016**

Pioneered the building of **Uganda Petroleum Institute, Kigumba (UPIK)**, March 2009 to Nov 2016.

Senior Presidential Advisor (on retainer) for Scientific Innovations, **Uganda Government**.

Member of Board of Control, **Senior Command and Staff College, Kimaka (SCSC)**, of Uganda Peoples Defence Forces. Prof Kwesiga is also a member of teaching staff.

Member and Vice Chairman of the Board for **National Enterprises Corporation (NEC)**

Member of **Senate and Council of University of Technology and Management, Uganda** (UTAMU)

Chairman, **Board of Governors**, Ntare School.

Under Prof Kwesiga's leadership UIRI was voted a Centre of Excellence in R&D for East African Community (EAC), in 2013.

MBARARA UNIVERISTY OF SCIENCE AND TECHNOLOGY (MUST)
15th MUST ANNUAL RESEARCH DISSEMINATION CONFERENCE
22 November 2019 at Igongo Cultural Centre, Mbarara, Uganda

Theme: Collaborative Transformational Research for Sustainable Community Development

Sub-themes:

1. Collaborative Innovations for health, service delivery and reduction of disease burden
2. Transformational Initiatives in herbal medicine and natural product Research & Development
3. Community engagement for water sanitation, hygiene and nutrition for sustainable health solutions
4. Science and technological innovations in learning and service delivery
5. Applied solutions in energy, health and industrial sectors
6. Research and innovation in business management, incubation and entrepreneurship
7. Transformative innovation in ethics, governance, leadership and policy for sustainable development
8. Sustainable agricultural practices and value addition for food security
9. Natural resources, physical planning and disaster management for climate change mitigation and environmental conservation

<u>OPENING PLENARY (KAARO HALL)</u>	
<u>22ND NOVEMBER 2019</u>	
07:45 -08:15am.	Arrival and registration of participants (Kaaro Hall)
8.15 – 8.25am.	Singing the Anthems and Prayer: National ,East African Community, and MUST
08:25 - 08.35am.	Welcome remarks by the Chairman Conference Organizing Committee(Board Chair DRGT) – Prof. Amon G. Agaba
08.35 – 8.45am.	Welcome remarks by DGRT Director – Assoc. Prof. Vincent Batwala
08:45 – 09:00am.	Opening Remarks by the Vice Chancellor – <i>Prof. Celestino Obua</i>

09:00 - 09:20am.	Guest of Honor - <i>Honorable Dr. Elioda Tumwesigye</i>
09.20 - 09.35am.	Guest Speaker 1 - <i>Dr. Eron Lawrence / Launching Disability and Special Needs policy</i>
09:35 -09:45am.	Guest Speaker 2 - Prof. John Chinyere Aguiyi
09.45 – 10.15am.	Keynote - <i>Prof. Charles Kwesigwa</i>
10:15 - 10.30am.	Group Photo and Health Break – Tea
10:30- 01.00pm.	Parallel sessions (<i>Kaaro Hall, Bushenyi Hall, Ntungamo Hall and Long Room</i>)
01:00 - 02.00pm.	Health Break – Lunch
02:05- 02.20pm.	Poster Session
02.20-05.00pm.	Parallel sessions (<i>Kaaro Hall, Bushenyi Hall, Ntungamo Hall, Long Room and Kaahwa Hall Lobby</i>)
05:00 -05.30 pm.	Health Break – Tea
05.35- 05.30pm.	Closing Ceremony: Conference wrap up and Presentation of Awards
06.30pm.	Cocktail
PARALLEL SESSION 1 (Kaaro Hall) - Morning	
Subtheme: <i>Collaborative innovations for health science for healthcare delivery and reduction of disease burden.</i>	
Session Chairs: Dr. Joel Bazira, Dr. Data Santorino	
10:30 am -10.42 am	Using I-Dress material impregnated with honey and olive oil to reduce Cesarean surgical site infection: Outcomes from application of I-Dress in animal model, Kamugisha Arnold
10.42 am -10.54 am	Explaining the successes and failures of tuberculosis treatment programs; a tale of two regions in rural Eastern Uganda, Jonathan Izudi
10.54 am -11.06 am	Poly-microbial interactions: the role of bacterial symbionts in modulation of innate immune responses during infection by <i>Rhizopus microsporus</i> , Herbert Itabangi
11.06 am -11.18 am	Comparison of Capillary Versus Venous Blood for the Detection of <i>P. falciparum</i> Malaria using Rapid Diagnostic Tests, Gorret M. Abalinda

11.18 am -11.30 am	The utility of 'home-made' reagent red blood cells for antibody screening during pre-transfusion compatibility testing in Uganda; Bernard Natukunda
11:30 am -11:50 am	Question and Answer/Discussion
11:50 am -12:02 pm	Psychosocial supports utilized by caregivers of patients with dementia in South western Uganda: A qualitative investigation, Catherine Abaasa
12:02 pm -12:14 pm	Modelling the effect of seasonal factors on malaria transmission in Uganda with human movement, Victor Yiga
12:14 pm -12:26 pm	Household asset index and duration of survival among patients with esophageal cancer in southwestern Uganda, Emmanuel B. Byaruhanga
12:26pm -12:38 pm	The impact of community health fairs on chronic disease screening, treatment, referral, and longitudinal data collection in rural southwestern Uganda, Gumisiriza Patrick
12:38 pm -12:50 pm	Experiences and Perspectives of Patients with Hypertension in Mbarara, Uganda; Gabriel Nuwagaba
12:50 pm -1:10 pm	Question and Answer/Discussion
1:10 pm -2:00 pm	HEALTH BREAK - LUNCH
PARALLEL SESSION 1 (Kaaro Hall) - Afternoon	
<i>Subtheme: Collaborative innovations for health science for healthcare delivery and reduction of disease burden.</i>	
<i>Session Chairs: Dr. Francis Bajunirwe, Dr. Grace Nambozi</i>	
2:00 pm -2:12 pm	Portrayals of mental illness, treatment, and relapse and their effects on the stigma of mental illness: Population-based, randomized survey experiment in rural Uganda; Allen Kiconco
2:12 pm -2:24 pm	The Prevalence of Neurocognitive Disorders and Their Association with Mode of Delivery Amongst 12 to 24 months Old Children At MRRH, South-Western Uganda, Kintu Mugagga
2:24 pm -2:36 pm	The experience of treating childhood cancer at mbarara regional referral hospital; Atwiine, B
2:36 pm -2:48 pm	Associations between adverse childhood experiences and adult depression in rural Uganda; Betty Namara
2:48 pm -3:00 pm	Alzheimer's disease and Related Dementias: A Qualitative Assessment of Perceived Training Needs of Primary Healthcare Providers in Rural South western Uganda; Clara Atuhaire
3:00 pm -3:20 pm	Question and Answer/Discussion
3:20 pm -3:32 pm	Intrapartum factors associated with fresh still births at Mbarara regional referral hospital; Ojara Sande
3:32 pm -3:44 pm	Family influence on women decision seeking maternal health services during antenatal and delivery; Hadija Swai
3:44 pm -3:56 pm	Healthy families program – integrating safer conception into HIV care; Kato Kalyebara Paul
3:56 pm -4:08 pm	Referral Practices by Community Health Workers for Childhood Illnesses at Community Level: A Five Year Trend; Michael Matte
4:08 pm -4:20 pm	Treatment supporters and level of health facility influence completion of sputum smear monitoring among tuberculosis patients in rural eastern Uganda: a mixed-methods study; Jonathan Izudi

4:20 pm -4:40 pm	Question and Answer/Discussion
4:40 pm - 4:52 pm	Fractional dose Yellow Fever Vaccines for outbreak response; Caroline Nerima
4:52 pm - 5:04 pm	Use of Modified Early Warning Score to identify Critically Ill patients at a University Teaching Hospital in South Western Uganda; Raymond Tumwesigye
5:04 pm - 5:16 pm	Optimizing mHealth for adherence monitoring and intervention- initial experiences; Edna Tindimwebwa
5:16 pm - 5:28 pm	Community-based management and care of people with dementia: A training needs assessment among village health teams in Uganda based on WHO guidelines; Christine Karungi
5:28 pm - 5:40 pm	Assessing 4 years (2015-2018) trend of under-five malaria case load at the seven health facilities within Bugoye sub county, Kasese district of western Uganda, Mbaju Jackson
5:40 pm -6:00 pm	Question and Answer/Discussion
PARALLEL SESSION 2 (BUSHENYI HALL) - Morning	
Sub theme: <i>Collaborative innovations for health science for healthcare delivery and reduction of disease burden</i>	
Session chairs: Dr. Joseph Ngonzi, Dr. Deusdedit Tusubira	
10:30 am -10.42 am	The efficacy and safety of Momordica charantia L. in animal models of type 2 diabetes mellitus; A systematic review and meta-analysis; Emanuel L. Peter
10.42 am -10.54 am	Hypertension and Diabetes mellitus in Kibiito town council, Kibiito sub-county, Bunyangabu district, south western Uganda: promoting awareness and service utilization; Winnifred Among
10.54 am -11.06 am	Effect of pineapple pulp fiber-enriched wheat flour on hyperlipidemia and oxidative stress in diabetic male wistar rats; Joash Okoboi
11.06 am -11.18 am	Effect of red cabbage leaf extract on the onset of insulin resistance in high-fat fed wistar rats; Nathan Kakongi
11.18 am -11.30 am	Awareness, Perceptions and Attitudes towards Cervical cancer and Cervical cancer screening among female Students at Mbarara University of Science and Technology, Uganda: A quantitative Study; Wasswa William
11:30 am -11:50 am	Question and Answer/Discussion
11:50 am -12:02 pm	Social norms and adherence to ART: a population-based study of persons with HIV in rural Uganda; Justus Kananura
12:02 pm -12:14 pm	Expanding HIV testing among Ugandan adults who utilize traditional healers: Preliminary results from a randomized controlled pilot study; Gabriel Nuwagaba
12:14 pm -12:26 pm	Factors Influencing Uptake of Cervical Cancer Screening services in rural Uganda: A qualitative study; Ayebare David Santson
12:26pm -12:38 pm	Prevalence and factors associated with intestinal parasitic infections among people living along the shores of Lake Kijanebalora, Rakai district; Zziwa Abiyasal

12:38 pm -12:50 pm	Barriers for male partner engagement to attend antenatal care in Misungwi district Tanzania; Boniphace Maendeleo
12:50 pm -1:10 pm	Question and Answer/Discussion
1:10 pm -2:00 pm	HEALTH BREAK - LUNCH
PARALLEL SESSION 2 (BUSHENYI HALL) - Afternoon	
Sub theme: <i>Community engagement for water sanitation, hygiene and nutrition for sustainable health solutions</i>	
Session chairs: Dr. Jeninah Atwebembeire, Prof. Robert Tamukong	
2:00 pm -2:12 pm	Male engagement bylaws: Unintended Consequences Impacting Care for Single Pregnant Women in Rural Tanzania; Dismas Matovelo
2:12 pm -2:24 pm	Healthy Families Program – A summary of key findings from HIV prevention studies in a safer conception program; Owembabazi Moran
2:24 pm -2:36 pm	Cost-effectiveness of facility and community-based treatment of moderate acute malnutrition using super cereal plus (CSB++) in Kyaka II Refugee Settlement, Uganda; Nabutanda Barbrah
2:36 pm -2:48 pm	Healthcare providers and Caregivers’ perspectives on factors underlying the persistent malnutrition of Children aged 0-59 months in Buhweju district, southwestern Uganda; Catherine Abaasa
2:48 pm -3:00 pm	Factors influencing intimate partner violence disclosure among pregnant women attending Mbarara Municipal Council Health Center IV; Katushabe Eve
3:00 pm -3:20 pm	Question and Answer/Discussion
3:20 pm -3:32 pm	Acute and sub-acute toxicity of Echinops kebericho extracts; Serawit Deyno
3:32 pm -3:44 pm	Physico-Chemical Quality of Selected Drinking Water Sources in Mbarara Municipality, Uganda; Ben Lukubye
3:44 pm -3:56 pm	Fungal contamination and aflatoxin occurrence along production stages of Ajono (local brew) from Soroti District, Eastern Uganda; Sarah Nantumbwe
3:56 pm -4:08 pm	Medicinal plant species used by local communities of Bwambara Sub-county, South Western Uganda; Hannington Gumisiriza
4:08 pm -4:20 pm	Adolescent vulnerability in the Health System, rural Tanzania; Wemaeli Mweteni
4:20 pm -4:40 pm	Question and Answer/Discussion
4:40 pm - 4:52 pm	Collaborative curriculum design and implementation for global student community engagement: experiences of faculty from MUST & UoC; Wilfred Arubaku
4:52 pm - 5:04 pm	Common illnesses among under 5 children managed by Community Health Workers in rural southwestern Uganda: A 5-year trend; Andrew Chrisopher Wesuta
5:04 pm - 5:16 pm	Mainstreaming the CHW program in district health systems in rural Mwanza region, Tanzania; Tumsifu Matutu
5:16 pm - 5:28 pm	Empowering girls and women in Rubirizi District on menstrual health/hygiene through education and reusable pads’ making skills; John Owor
5:28 pm - 5:40 pm	

5:40 pm -6:00 pm	Question and Answer/Discussion
PARALLEL SESSION 3 (NTUNGAMO HALL) - Morning	
Sub theme: <i>Science and technological innovations in learning and service delivery & Applied solutions in energy, health and industrial sectors.</i>	
Session Chairs: Dr. Evarist Nabaasa, Prof. Grace Birungi	
10:30 am -10.42 am	Development of a Rapid diagnostic test for cervical cancer in resource constrained countries; Habert Tumwesigye
10.42 am -10.54 am	Adaptive-Size Dictionary Learning using Information Theoretic Criteria for Image Reconstruction in Low Field Magnetic Resonance Imaging; Emmanuel Ahishakiye
10.54 am -11.06 am	Let All Know: Insights from a digital story telling facilitator training in Uganda; Wasswa William
11.06 am -11.18 am	On the possible contribution of ionospheric vertical drifts to TEC modelling in low latitudes; Valence Habyarimana
11.18 am -11.30 am	On the Geometrically induced Spectrum of a two-dimensional Robin Quantum Waveguide; Abdulwahabu Mbidde Sentayi
11:30 am -11:50 am	Question and Answer/Discussion
11:50 am -12:02 pm	Testing Leech's Model on Successful Doctoral Student Completion in Makerere University; Lunyolo, O
12:02 pm -12:14 pm	Bullying, Pro-social behaviors, and Attendance among Secondary School Students in Kashari County, Mbarara District; Micheal Herb Bangi
12:14 pm -12:26 pm	Preparation and characterisation of reducedphosphomolybdate via molybdenum blue reaction; Nalumansi Irene
12:26pm -12:38 pm	Analyzing Gender Symbolism of Electronic Resources among Faculty for Enhanced Uptake and Transformation of Teaching: The Case of Electronic Resources in Public Universities in Uganda; Ruth Nsibirano
12:38 pm -12:50 pm	On the property of factorable strongly R-summing multilinear operators on banach spaces; John Emenyu
12:50 pm -1:10 pm	Question and Answer/Discussion
1:10 pm -2:00 pm	HEALTH BREAK - LUNCH
PARALLEL SESSION 3 (NTUNGAMO HALL) - Afternoon	
Sub theme: <i>Sustainable agricultural practices and value addition for food security; and Natural resources, physical planning and disaster management for climate change mitigation and environmental conservation</i>	
Session Chairs: Proj. Julis B. Lejju, Dr. Medard Twinamasiko	

2:00 pm -2:12 pm	Assessment of the leaching of copper, chromium and lead into drinks served using plastic cups; Ahimbisibwe oliver
2:12 pm -2:24 pm	Characterization and insect repellent activity of essential oils from leaves of Euphorbia heterophylla; Ivan Kahwa
2:24 pm -2:36 pm	Consumer preference of jackfruit (artocarpus heterophyllus lam) in Uganda; Justine Nakintu
2:36 pm -2:48 pm	Local knowledge on pumpkin production, performance and utilization systems for value addition avenues from selected agro-ecological zones of Uganda; Immaculate Nakazibwe
2:48 pm -3:00 pm	Post-harvest handling practices and their influence on physico-chemical and microbial status of beef along the meat value chain in Uganda; Juliet Kyayesimira
3:00 pm -3:12 pm	Pesticidal properties of selected plant species on pests of Brassica vegetables: A case study of Katanda Sub-County, Rubirizi District; Racheal Lamara
3:12 pm -3:32 pm	Question and Answer/Discussion
3:32 pm -3:44 pm	Comparative effects of selected organic and inorganic fertilizers on growth and productivity of rhizobia inoculated and non-inoculated bio fortified NAROBAN 2; David Mubiru
3:44 pm -3:56 pm	Gonadal Development and Intersex Condition of Marbled Lungfish, Protopterus aethiopicus (Heckel, 1851) in Environmentally Contaminated Sites in Lake Victoria, Uganda; Inuwa Badamasia
3:56 pm -4:08 pm	Diversity of benthic macroinvertebrates in anthropogenically disturbed River Aturukuku, Eastern Uganda; Hannington Ochienga
4:08 pm -4:20 pm	Modeling Biological Control Dynamics of the Banana Weevil, Cosmopolites Sordidus, (Germar), by Generalist Predators in a Banana Agroecosystem; Eliabu Horub Kweyunga
4:20 pm -4:32 pm	Gap dynamics and their influence on the chimpanzee food tree regeneration: case of Musanga leo-errerae, chimpanzees' fall back fruit in Kalinzu forest; Humphrey Kato
4:32 pm - 4:44 pm	Impacts and adaptation to climate change of local communities around Bwindi Mgahinga Conservation Area (BMCA); Dennis Babaasa
4:44 pm - 5:10 pm	Question and Answer/Discussion
PARALLEL SESSION 4 (LOUNG ROOM) - Morning	
Sub themes: <i>Transformative innovation in ethics, governance, leadership and policy for sustainable development and Community engagement for water sanitation, hygiene and nutrition for sustainable health solutions.</i>	
Session Chairs: Prof. Jerome Kabakyenga, Dr. Viola Nyakato	
10:30 am -10.42 am	Transparency and engagement of Community leaders leading to successful implementation of a Community Health Worker program (CHW), rural Tanzania; Tumsifu Matutu
10.42 am -10.54 am	Antecedents of Organizational Citizenship Behavior among Academic Staff in Universities in Uganda: A Conceptual Paper; Kabasiita

10.54 am -11.06 am	Sexual and Gender Based Violence Intervention Mechanisms in Refugee Communities: A Case of Nakivale Refugee Settlement, Isingiro District in Uganda; Veronica Nakijoba
11.06 am -11.18 am	Women's intention to deliver at home: Understanding the psycho-social and cultural factors influencing birthing choices for unskilled home delivery amongst recent postpartum women in south western Uganda; Esther Natukunda
11.18 am -11.30 am	Socio-economic factors affecting access and use of MNCH services among Vulnerable Women in Southwestern Uganda; Clemencia Murembe
11:30 am -11:50 am	Question and Answer/Discussion
11:50 am -12:02 pm	Sexual and gender based violent in protracted displacement: Social relations, survival strategies and response mechanisms in Nakivale Refugee Settlement, Uganda; Cleophas Karooma
12:02 pm -12:14 pm	Factors affecting Maternal health services utilizations by women of reproductive age 15-49; Christopher Turyatunga
12:14 pm -12:26 pm	Types of non-allopathic therapies among children under five in southwestern Uganda. A qualitative study; Peter Chris Kawungezi
12:26pm -12:38 pm	Prevalence and Correlates of Gambling Disorder Among Secondary School Students in Mbarara Municipality Uganda; Michael Anyanwu
12:38 pm -12:50 pm	Prevalence and Associated Socio-Demographic Factors of Hazardous Alcohol Use among Urban Refugees in Mbarara Municipality, Uganda; Ronald Bahati
12:50 pm -1:10 pm	Question and Answer/Discussion
1:10 pm -2:00 pm	HEALTH BREAK - LUNCH
PARALLEL SESSION 4 (LOUNG ROOM) - Afternoon	
<i>Sub themes: Transformative innovation in ethics, governance, leadership and policy for sustainable development; Research and innovation in business management, incubation and entrepreneurship; and Community engagement for water sanitation, hygiene and nutrition for sustainable health solutions</i>	
Session Chairs: Dr. Manasseh Tumuhimbise, Dr. Cleophas Karooma	
2:00 pm -2:12 pm	Gender relations and household income utilization among working educated couples in Mbarara Municipal Council in Mbarara Municipality, Uganda; Adebayo Tajudeen Sanni
2:12 pm -2:24 pm	Gender Based Violence Study in National Teachers' Colleges (NTCs) and Business, Technical and Vocational Education Training Institutions (BTVETs) In Uganda; Mapping non-partner gender-based violence on campus; Viola Nyakato, Kristien Michielsen and Elizabeth Kemigisha
2:24 pm -2:36 pm	Barriers for Illiterate women in accessing maternal health care in rural Northern Tanzania; Dismas Matovelo
2:36 pm -2:48 pm	VHT Livelihood Skills in Bugoye sub-county south western Uganda; Norbert Mumbere

2:48 pm -3:00 pm	A cross-sectional study using case-based skills assessment to measure quality of Integrated Community Case Management care delivered by village health workers in Bugoye, Uganda; Rapheal Mbusa
3:00 pm -3:20 pm	Question and Answer/Discussion
3:20 pm -3:32 pm	Influence of the promotional strategies on the consumer attitudes of TM users in Central Uganda; Sarah Nabacwa
3:32 pm -3:44 pm	Financial accountability mechanisms in local governments in Uganda: a case of Kabale district local government; Marus Eton
3:44 pm -3:56 pm	Financial reforms implementation and accountability for Public funds in Uganda's local governments: evidence from selected districts in south-western Uganda; Muhereza John Innocent
3:56 pm -4:08 pm	Financial inclusion and economic growth in Uganda: A case of selected districts in western Uganda; Marus Eton
4:08 pm -4:20 pm	Loan delinquency management strategies and financial performance of Savings and Credit Cooperative Societies in Mbarara Municipality; Baluku Watsema
4:20 PM – 5:20 PM	Digital Storytelling Screening Workshop: Enabling the voiceless to share their own MNCH Experiences Globally; Barbara Naggayi
5:20 pm -6:00 pm	Question and Answer/Discussion
POSTER SESSION (KAAHWA HALL LOBBY)	
	Evaluating an undergraduate community engagement-focused global health field school in rural Uganda: assessing student and community outcomes; Wilfred Arubaku
	Effect of feed supplementation on milk quality in Uganda's south-western cattle corridor: a case study of Biyinzika dairy meal; John Mary Atusasiibwe
	Prevalence and Correlates of Gambling Disorder Among Secondary School Students in Mbarara Municipality Uganda; Michael Anyanwu,

SUBTHEME: Collaborative innovations for health science for healthcare delivery and reduction of disease burden

Using I-Dress material impregnated with honey and olive oil to reduce Cesarean surgical site infection: Outcomes from application of I-Dress in animal model

Ngonzi Joseph¹, Nambogo Nuriat², Edgar Mugema Mulogo¹, **Kamugisha Arnold**², Ssenkumba Brian¹, Okoth Thomas³, Komakech Ignatius⁴;

*Mbarara University of Science and Technology¹,
Consortium for Affordable Medical Technologies²,
Uganda Industrial Research Institute³,
Uganda Cancer Institute⁴*

Abstract

Surgical site infection (SSI) is responsible for up to 3% maternal mortality. The prevalence of surgical site infections following Cesarean delivery at Mbarara Hospital is 15.5%. We are developing a low-cost wound dressing material (I-Dress) made from is honey and olive oil. The objective of this component of the study was to evaluate the outcome of application of I-Dress in animal specimen. Product development (dressing) was done at Uganda Industrial Research Institute UIRI).UIRI provided guidance on the mixture and exact measurements of the product ingredients. Sterility for ready-to-use dressing was achieved using radiation techniques done at Uganda Cancer Institute. The dressing was applied to guinea pigs divided into three groups, each 5 and kept separately under laboratory condition. Group I (Positive control): animals received 20µg/ml Ciprofloxacin topically on the wound area. Group II (Negative control): animals were healing naturally without any formulation applied. Group IV (Honey-Olive oil combination test): animals received Honey and Olive oil formulation. All these were incorporated in Plaster gauze and placed on excised wound area (1.5cm in diameter). Progressive wound diameter was measured by tracing the wound using a sterile thread and measured on a ruler. Honey-olive oil (0.6cm) had the best healing effect on the wounds followed by, positive control (0.78) and then negative control (0.8) by the second day. However, from the fourth day onwards, the sequence of performance was consistent for all the samples. Our results show that honey-olive oil had the best healing effect on the wounds followed by positive control and negative control. I-Dress promotes rapid wound healing as compared to other types of material in the animal model its application needs to be studied in a human model.

Explaining the successes and failures of tuberculosis treatment programs; a tale of two regions in rural Eastern Uganda

¹Jonathan Izudi, ¹Imelda K Tamwesigire, ¹Francis Bajunirwe

¹Department of Community Health, Faculty of Medicine, Mbarara University of Science and Technology.

ABSTRACT

Well performing tuberculosis (TB) programs are characterized by treatment success rate (TSR) of at least 90%. In rural eastern Uganda, and elsewhere in sub Saharan Africa, TSR varies considerably across district TB programs and the reasons for the differences are unclear. This study explored factors that explain the low and high TSR across four districts in rural eastern Uganda. Methods. We interviewed District TB and Leprosy Supervisors (DTLS), Laboratory focal persons (LFPs) and TB focal persons (TBFPs) from four districts in Eastern Uganda as key informants. Interviews were audio recorded, transcribed verbatim, and imported into ATLAS.ti where thematic content analysis was performed. We summarized the results into themes. The emerging themes were categorized as either facilitators of or barriers to treatment success. The emerging facilitators prevailing in the districts with high rates of treatment success were using data to make decisions and design interventions, continuous quality improvement, capacity building, and considering TB as a priority disease. The barriers that were common in districts with low rates of treatment success included lack of motivated and dedicated TB focal persons, scarce or no funding for implementing TB activities, and poor implementation of community-based directly observed therapy short course. This study shows several factors account for the differing rates of treatment success in rural eastern Uganda. These factors should be the focus for TB control programs in Uganda and similar settings in order to improve rates of treatment success.

Poly-microbial interactions: the role of bacterial symbionts in modulation of innate immune responses during infection by *Rhizopus microsporus*

Herbert Itabangi^{1,5}, Ignacio Insua², Bradley Pollard¹, Mark Probert¹, Zoe Reading¹, Poppy Sephton Clark, Xin Zhou¹, Joao Correia¹, Gordon Brown³, Carol Munro³, Jason King⁴, Francisco Fernandez Trillo², Elizabeth Ballou¹, Kerstin Voelz¹

¹Institute of Microbiology and Infection, School of Biosciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK

²School of Chemistry, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK.

³Aberdeen Fungal Group, MRC Center for Medical Mycology, Institute of Medical Sciences, University of Aberdeen, Foresterhill Aberdeen, AB25 2ZD, UK.

⁴Department of Biomedical Science, the University of Sheffield, Western Bank, Sheffield, S10 2TN, UK.

Department of microbiology, Faculty of medicine, Mbarara University of science and Technology, P.O BOX 1410, Uganda

Abstract

Mucormycosis is a life-threatening mold infection with overall mortality rates of 50%, yet fatality levels reach 100% in patients with disseminated disease, prolonged neutropenia, or brain involvement. The disease is caused by a group of filamentous fungi, the mucorales and particularly targets patients with immunosuppression due to diabetic ketoacidosis (DKA), iron overload, severe trauma, neutropenia, corticosteroid treatment, or organ transplantation. These predisposing conditions are linked to defects in key aspects of the innate immunity, particularly defects in phagocytic effector functions by macrophages and neutrophils, suggesting phagocytic activity is crucial to disease control. Yet, we currently have a very limited understanding of the interaction between mucormycete infecting spores and phagocytes. In this study, we show that the early events during phagocyte-spore interaction may determine infection by *R. microsporus*. We report that spore metabolism modulates macrophage effector functions including phagocytic uptake of spores, phagosome acidification following uptake and cytoskeletal organisation via a secreted factor. We also demonstrate the secreted factor is not produced by *R. microsporus* but a bacterial endosymbiont *Ralstonia pickettii*. This is a close relative of Paraburkholderia species belonging to the family *Burkholderiaceae* that produce rhizo-toxins already characterized and implicated in plant pathology but not yet in human disease. However, although the secreted compound here shares chemical and functional signatures with the rhizo-toxins, it is not a rhizo-toxin.

Comparison of Capillary Versus Venous Blood for the Detection of *P. falciparum* Malaria using Rapid Diagnostic Tests

Gorret M. Abalinda¹, Edgar Mulogo¹, Dan Nyehangane¹², Shem Bwambale³ and Ross M. Boyce¹⁴

¹Mbarara University of Science and Technology

²MSF/Epicenter

³Bugoye Health Centre

⁴University of North Carolina at Chapel Hill

Abstract

Rapid diagnostic tests (RDT) are the most widely used method for malaria screening and diagnosis in endemic, resource limited areas. Both capillary and venous blood is frequently used with the choice often depending on the need for additional blood tests. While test results of these different sampling methods are generally considered interchangeable, *P. falciparum* parasites are known to sequester in capillaries; which could give greater sensitivity with the use of capillary blood. Therefore, we sought to compare the results of different RDTs when using both capillary and venous blood samples. To achieve this, we conducted a prospective, observational cohort study among 250 febrile children attending Bugoye Health Centre in western Uganda. Both samples were collected from each participant and tested using four different malaria RDTs according to manufacturer's instructions. We estimated the level of agreement between results obtained from capillary as compared to venous blood for each assay using Cohen's Kappa coefficient. Observed agreement between results from capillary as compared to venous blood for SD Bioline Malaria Ag RDT, Alere Malaria Ag Pf, SD Bioline Malaria Ag Pf/Pan and SD Bioline Malaria Ag Pf/Pf/Pv was 99.6% (P= <0.001 and Kappa: 0.99), 99.2% (P= <0.001 and Kappa: 0.98) 99.6% (P=<0.001 and Kappa: 0.99) and 97.2% (P=<0.001 and Kappa: 0.95) respectively. There was one discordant result with SD Bioline Malaria Ag and SD Bioline Malaria Ag Pf/Pan RDTs, two with Alere Malaria Ag Pf RDT and seven with SD Bioline Malaria Ag Pf/Pf/Pv; most of which (4/7, 57.2%) were attributable to differences in the T2 (*Pf*-specific pLDH) antigen band. In conclusion, this study demonstrates no significant differences in results for the four different malaria RDTs when using capillary and venous blood with high level of agreement. We recommend the use of both blood samples.

Key words: *agreement, capillary, malaria, RDT, venous*

The utility of ‘home-made’ reagent red blood cells for antibody screening during pre-transfusion compatibility testing in Uganda

Bernard Natukunda, Robert Wagubi, Ivan Taremwa, Benson Okongo, Yona Mbalibulha, Gayle Teramura and Meghan Delaney

Abstract

The World Health Organization (WHO) recommends that pre-transfusion testing should include ABO/RhD grouping followed by screening for red blood cell (RBC) alloantibodies using the indirect antiglobulin test (IAT). However, in Uganda, current practice includes only ABO/RhD grouping plus room temperature (RT) saline cross-matches without additional RBC alloantibody screening. The aim of the study was to assess the utility of ‘home-made’ reagent RBCs in pre-transfusion RBC alloantibody screening in the Ugandan setting. Using a cross-sectional study design, consenting group O RhD positive volunteers were recruited as reagent RBC donors. Extended phenotyping was performed for the following RBC antigens: C, c, E, e, K, Fy^a, Fy^b, Jk^b, S and s in order to find appropriate RBCs for use in alloantibody detection tests. These ‘home-made’ reagent RBCs were then preserved using Alsever’s solution and later utilized in RBC alloantibody screening. For quality assurance, repeat antibody screening on positive samples was performed at Bloodworks Northwest Immunohematology Reference Laboratory in Seattle, United States. There were a total of 36 blood group O RhD positive individuals recruited as reagent RBC donors (median age, 25 years; range, 21 – 58 years; male-to-female ratio, 1.6:1). Using the reagent cells, 32 (10.3%) out of the 311 IATs were found to be positive. Overall, there were 27 patients alloimmunized to RBC antigens at the time of follow up with a rate of post-transfusion RBC alloimmunization of 12.3%. Confirmatory IAT testing performed in the United States was in agreement with the initial serological findings in Uganda. The use of ‘home-made’ reagent cells during pre-transfusion testing in Uganda is feasible. We recommend the introduction of pre-transfusion IAT RBC alloantibody screening in Uganda using ‘home-made’ reagent RBCs in order to improve transfusion safety and outcomes.

Key words: *Blood transfusion, ‘Home-made’ reagent RBCs, Pre-transfusion testing, RBC alloantibody screening, Uganda.*

Psychosocial supports utilized by caregivers of patients with dementia in South Western Uganda: A qualitative investigation

Catherine Abaasa¹, Celestino Obua², Edith K. Wakida³, Godfrey Zari Rukundo⁴

¹Department of Medical Laboratory Sciences, Mbarara University of Science and Technology

²Department of Pharmacology and Therapeutics

³Office of Research Administration, Mbarara University of Science and Technology

⁴Department of Psychiatry, Mbarara University of Science and Technology

ABSTRACT

Patients with dementia experience problems ranging from mild to severe impairments in daily life activities. In Uganda, like in most other low and middle-income countries, families are a cornerstone in providing care to patients with dementia. Serving as a caregiver for a person with Alzheimer's disease is a physically, emotionally and financially demanding role, that is associated with increased stress, depression, fatigue, and financial strain. These have often resulted in elder abuse or neglect of the patients. Currently, data on psychosocial supports available to caregivers of patients with dementia in Uganda is not available. We conducted a qualitative assessment of the psychosocial supports available to caregivers of patients with Alzheimer's disease and related dementias in southwestern Uganda, including the content of the formal and informal support interventions and by whom they are delivered. Medical practitioners provide educational support on the diagnosis and prognosis of dementia, but may not provide emotional support in the form of counseling to caregivers of patients with dementia. Caregivers in Southwestern Uganda, receive unstructured emotional and instrumental support from sources outside of the medical system such as family and community, which leave the Caregivers in confusion. The medical care system offers some information about the clinical presentation of Alzheimer's disease but little or no psychosocial support to the Caregivers of patients with the disease. This has implications for how families and Caregivers cope with the day-to-day care of patients with Alzheimer's disease in Uganda and calls for institutionalization of structured psychosocial support for Caregivers to improve the care given to Alzheimer's patients.

Modelling the effect of seasonal factors on malaria transmission in Uganda with human movement

Victor Yiga

Mbarara University of Science and Technology

Abstract

Malaria is one of the world's most prevalent epidemics, current control and eradication efforts are being frustrated by rapid changes in climatic factors such as temperature and rainfall. Human movement is believed to have a contribution to the changes in the dynamics of malaria transmission in Uganda. In this study we aim at assessing the impact of seasonal factors and human movement on the intensity of malaria transmission in Uganda. We develop a host-vector deterministic model which incorporates temperature, rainfall and human immigration with proportions of infective and exposed. The model is developed using a system of differential equations, the basic reproduction number is obtained using the next generation method. Analysis of the system shows that there is no disease free equilibrium in presence of exposed and infective immigrants. The vector free-disease free and the vector endemic- disease free equilibrium are locally stable. Numerical simulations are used to show the impact of various temperature – rainfall quantities on the number of infective humans.

Key words: *Basic reproduction number, Local stability, Numerical simulation*

Household asset index and duration of survival among patients with esophageal cancer in southwestern Uganda

Emmanuel B. Byaruhanga¹; Susan Joan Akello¹; Emmanuel Dwomoh¹; Christopher K Opio⁴; Kathleen E. Corey; Winnie R. Muyindike¹; Ponsiano Ocama⁴; David D. Christiani^{5,6,7}; Samson Okello^{1,2,3*}

¹*Department of Internal Medicine, Mbarara University of Science and Technology, P. O Box 1410, Mbarara, Uganda.*

²*Lown Scholars Program, Department of Global Health and Population, Harvard T.H. Chan School of Public Health, Boston, MA, USA.*

³*Division of Infectious Diseases and International Health, Department of Medicine, University of Virginia Health Systems, Charlottesville, VA, USA.*

⁴*Department of Medicine, Makerere University, Kampala, Uganda.*

⁵*Harvard Medical School, Boston, MA, USA.*

⁶*Department of Medicine, Massachusetts General Hospital, Boston, MA, USA.*

⁷*Department of Environmental Health, Harvard T.H. Chan School of Public Health, Boston, MA, USA.*

**Corresponding Author*

Abstract

Household wealth index is a key determinant of health. We sought to determine the relationship between household asset ownership (wealth) index and survival among patients with esophageal squamous cell carcinoma (ESCC) in Southwestern Uganda. Consecutive patients with histological diagnosis of ESCC at Mbarara Regional Referral Hospital were enrolled and followed between November 2017 and October 2019 until death or 15 October 2019 which ever came first. We collected demographic data, assets owned, smoking, alcohol intake, cooking practices, and ascertained survival status monthly via telephone calls to next of kin. We used principle component analysis to generate an assets index score based on household utilities and assets to derive composite measures with highest discriminatory capabilities. Participants were divided into asset index quintiles. Poisson regression was used to determine incidence of death and assess socioeconomic status (asset index) as a predictor of death.

A cohort of 78 ESCC participants contributed to 312.6 person-months follow-up, mean age 62.3years (SD 12.8) and with a male predominance (74.4%). Incidence of mortality was 232.3 per 1000 person months for male and 164.3 per 1,000 person months for female. In the adjusted Poisson regression model, inhouse cooking (IRR 2.15, 95%CI 1.25,3.70) predicted death while High asset index was a risk for early death. In southwestern Uganda, higher socioeconomic status and in-house cooking predicted mortality among ESCC patients. Cooking outside of house may reduce mortality due to ESCC in rural southwestern Uganda.

Key words; *esophageal squamous cell carcinoma, household asset index, survival*

The impact of community health fairs on chronic disease screening, treatment, referral, and longitudinal data collection in rural southwestern Uganda

***Gumisiriza Patrick**, Baguma Charles¹, Justin Rasmussen², Dagmar Vorechovska², Amy McDonough², Emily Satinsky², Bernard Kakuhikire¹, Crystal North², Mark Siedner², Alexander Tsai²

¹*Mbarara University of Science and Technology, Mbarara, Uganda.*

²*Massachusetts General Hospital, Boston, Massachusetts, United States of America,*

Abstract

Health fairs (HFs) are a common public health promotion activity and serve as important venues to connect underserved populations with the healthcare system. Little is known about their impact on longitudinal survey and biomarker data collection. As part of a larger population-wide longitudinal cohort study (HopeNet) in a rural parish of approximately 2,400 adults in southwestern Uganda, we conducted five-day biennial HFs using a modular service point approach. Community volunteers, local health personnel, medical students, and Global Health Collaborative research staffs screened, treated, and referred participants for chronic and other medical conditions, and collected survey and biomarker data to measure prevalence and correlates of non-communicable diseases (NCDs). Three biennial HFs have been conducted; 1,729 individuals (HopeNet participants and non-participants) attended in 2015, 1,123 in 2017, and 1,543 in 2019. Approximately 62% of attendees at each HF were female. Since the first HF, 568 participants have been referred to care for hypertension, 63 for diabetes, 372 for chronic lung disease, and 106 for HIV. In addition, in 2017, 22 participants were screened and treated on site with cryotherapy for cervical cancer, and in 2019, 154 participants were screened and treated for syphilis. Each year, a subset of HopeNet study participants completed a 10-15-minute survey on individual health behaviors and medical history (852 in 2015, 512 in 2017, 790 in 2019). While biomarkers were also collected on 760, 480, and 704 individuals at each respective HF, data analysis examining correlates with NCDs is outstanding. This cost about \$111 per person attending in 2015, \$95 in 2017, and \$47 in 2019. Community HFs facilitated early disease detection, treatment, and referral to higher level care; furthermore, HFs contributed to cost-effective collection of longitudinal survey and biomarker data. These lessons can be applied to HFs in other settings to meet community health and research needs concurrently.

Keywords: *health fair, non-communicable diseases, rural Uganda*

Experiences and Perspectives of Patients with Hypertension in Mbarara, Uganda

Austin Herbst^a, Gabriel Nuwagaba^b, Peter Olds^c, Jessica Haberer^{b,c}, Samson Okello^{b,*}

^aHarvard Medical School

^bMbarara University of Science and Technology

^cMassachusetts General Hospital

*Corresponding author

Abstract

Hypertension is a common cardiovascular risk factor that accounts for a majority of cardiovascular disease burden. We aimed to describe how patients with hypertension in Mbarara, Uganda, experience and perceive hypertension in order to understand the factors that drive patient-centered care of hypertension and contribute to how care is delivered in this setting. We purposively enrolled patients with a physician-made diagnosis of hypertension and taking antihypertensive medication for at least 1 month. A trained assistant performed in-depth interviews of 30 participants in outpatient clinics at Mbarara Regional Referral Hospital focusing on the perceptions and experiences with the diagnosis, management, care at the clinic and at home with hypertension. Sampling blocks of 5 each by gender and comorbid conditions (diabetes and HIV) were used to capture varied experiences. We used a content analysis approach to develop a codebook and identify themes. In our preliminary results, the major barriers to care for patients include inconsistent access to regular medications and difficulty with transport to the clinic, both in time needed and expense. Facilitators to care included family support and accessible clinics, which were consistently identified by participants as major factors for initiating and maintaining treatment. Many participants also identified an understanding of the important lifestyle and dietary changes required to control hypertension, and several expressed a concern of hypertension as a chronic disease that can lead to future complications if not controlled. Considering patient factors, including understanding of disease and lifestyle adjustments to prevent complications, in healthcare delivery can help ensure adequate management of hypertension and other NCDs by aligning the clinic structure and resources with patient values and beliefs, such as by counseling family members alongside patients or strengthening social work resources.

Key words: *care delivery, hypertension, patient experience*

Portrayals of mental illness, treatment, and relapse and their effects on the stigma of mental illness: Population-based, randomized survey experiment in rural Uganda

Allen Kiconco¹, Justin D. Rasmussen², Bernard Kakuhikire¹, Charles Baguma¹, Scholastic Ashaba¹, Christine E. Cooper-Vince², Jessica M. Perkins³, David R. Bangsberg⁴, Alexander C. Tsai^{2,5}

¹Mbarara University of Science and Technology, Mbarara, Uganda, ²Massachusetts General Hospital, Boston, Massachusetts, United States of America, ³Peabody College, Vanderbilt University, Nashville, Tennessee, United States of America, ⁴Oregon Health Sciences University–Portland State University School of Public Health, Portland, Oregon, United States of America, ⁵Harvard Medical School, Boston, Massachusetts, United States of America

Abstract

Stigma toward mental illness is a barrier to improving mental health globally; yet, evidence regarding how to reduce this stigma remains limited. Increasing individuals' understanding of mental illness as a treatable medical condition may influence stigmatizing beliefs. We embedded a randomized survey experiment within a whole-population cohort study in rural southwestern Uganda to assess the extent to which portrayals of mental illness treatment effectiveness influenced personal beliefs and perceived norms about mental illness. 1,355 adults were randomly assigned to receive either a vignette describing a typical woman (control condition) or one of nine variant vignettes describing different symptom presentations (suggestive of schizophrenia, bipolar, or major depression) and treatment course (no treatment, treatment with remission, or treatment with remission followed by subsequent relapse). Participants then answered questions about personal beliefs and perceived norms in three stigma domains: willingness to have the woman marry into their family, belief that she is receiving divine punishment, and belief that she brings shame on her family. We used multivariable Poisson and ordered logit regression models to estimate the causal effect of vignette treatment assignment on each stigma-related outcome. In multivariable Poisson regression models, vignette portrayals of untreated mental illness, relative to the control condition, increased the risk that study participants endorsed stigmatizing personal beliefs about mental illness and toward persons with mental illness, irrespective of mental illness type (adjusted risk ratios [ARRs] varied from 1.7–3.1, all $p < 0.001$). Portrayals of effectively treated mental illness immediately followed by relapse also increased the risk of responses indicating stigmatizing personal beliefs relative to control (ARRs varied from 1.5–3.0, all $p < 0.001$). Portrayals of initially effective treatment had little moderating influence on stigmatizing responses relative to vignettes portraying untreated mental illness. Further research is necessary to understand the relationship between mental illness treatment and stigmatizing attitudes in Uganda and other countries worldwide.

Keywords: *stigma, mental illness, rural Uganda, randomized survey*

The Prevalence of Neurocognitive Disorders and Their Association with Mode of Delivery Amongst 12 to 24 months Old Children At MRRH, South-Western Uganda

Kintu Mugagga

Department of Anatomy, Faculty of Medicine, MUST.

Abstract:

The Prevalence of Neurocognitive Disorders and Their Association with Mode of Delivery Amongst 12 to 24 months Old Children At MRRH, South-Western Uganda. The objective was to determine the prevalence of neurocognitive disorders and their association with the mode of delivery amongst children at 12 to 24 months age who were delivered at MRRH in South Western Uganda. The Study Design was a cross sectional study including 439 children born between January, 2017 and January, 2018 by either caesarean section delivery (CSD) or vaginal delivery (VD) at MRRH. Bayley Scales of Infant and Toddler Development (3) was used for assessing the incidences of cognitive, language, or motor functional disorders. Composite scores below 85 were considered for delayed neurological development or disorder. A structured questionnaire was used to collect maternal socio-demographic, obstetric and medical information, as well as the child demographic and health information. Data was entered in database designed with MS- excel version 7.2 and analysed with STATA. Scores were compared in univariate and multivariable analyses for children in the two mode of delivery groups. Of 439 included children, 102 (23%) and 337 (77%) were delivered by CSD and VD respectively. Overall, 52 (12.4%) had composite scores (<85) for neurological disorders involving cognitive, language and motor function. 12 (12.4%) and 40 (12.5%) of the CSD and VD respectively had neurological disorders. However, there was no significant difference ($p>0.05$) between CSD and VD modes in respect to the incidences of cognitive, language or motor disorders as outcomes. Delayed start and short-lived breast feeding were both significantly ($p<0.05$) associated with NCD. Under multivariable analyses higher child age (21 to 24 months) and low maternal education (<primary) were associated with increased odds of neurocognitive disorders (NCD) (OR,CI): 2.7 (1.2-6.4), 4.7 (1.14-5.6) respectively. Neurocognitive disorders were identified and the mode of delivery was one of the probable cause although no adequate evidence could be established between CSD and VD as a higher risk contributor.

Keywords: *Prevalence - Neurocognitive disorders - Caesarean - Vaginal- Delivery modes*

The experience of treating childhood cancer at mbarara regional referral hospital

Atwiine, B^{1,2}; Ankunda, S³., Tibenderana, B⁴., Kumbakumba E^{1,2}., Mwanga, J^{1,2}., Weinstein, H^{5,6}.

¹Mbarara University of Science and Technology, Department of Paediatrics and Child Health, Mbarara, Uganda.

²Mbarara Regional Referral Hospital, Department of Paediatrics and Child Health, Mbarara, Uganda

³Mulago Hospital Complex, Department of Paediatrics and Child Health, Kampala, Uganda

⁴Uganda Cancer Institute, Department of Radiation Oncology, Kampala, Uganda

⁵Massachusetts General Hospital, Department of Pediatrics and Child Health, Paediatric Hematology and Oncology, Boston, Massachusetts, USA.

⁶Havard Medical School, Department of Pediatrics and Child Health, Pediatrics Hematology and Oncology, Boston, Massachusetts, USA.

With a decrease in the incidents of childhood infectious diseases, like malaria and pneumonia, cancer is becoming an important cause of morbidity and mortality among children in the developing world and its trends have recently been changing. We describe the patterns of cancer diagnosis and treatment outcomes of children treated at Mbarara Regional Referral Hospital (MRRH) Cancer Unit, in South West Uganda to show the changing trends of childhood cancer epidemiology. In a 3-year retrospective analysis, between January 2016 and December 2018, data regarding age, sex, cancer diagnosis, treatment and outcomes was extracted from medical files of all children <16 years diagnosed with cancer at the Paediatric Cancer Unit of MRRH in South West Uganda. Descriptive statistics and Kaplan-Meyer curves were used to describe the diagnostic patterns and treatment outcomes respectively. Approval was offered by the Institutional Review Board (IRB) of Mbarara University of Science and Technology (MUST). A total of 202 children were diagnosed with cancer over the three years (43, 65 and 94 in 2016, 2017 and 2018 respectively), of whom 107(53%) were male, 95(47%) 1-5 years, 62(30.6%) 5-10 and 45 (22.2%) >10 years. Acute leukemia was diagnosed in 50(24.7%) children [41 Acute Lymphoblastic Leukemia and 9 Acute Myeloid leukemia], 40(19.8%) Wilms tumor, 26(12.8%) rhabdomyosarcoma, 22(10.9%) Hodgkin lymphoma, 15 (7.4%) Burkitt lymphoma and 49(24%) with miscellaneous conditions. Eighty-five (42%) children are alive, 68(33.7) died and 49(24%) abandoned therapy.

More attention, resources and awareness need to be directed towards children with cancer in order to unmask the extent of its burden in our settings.

Associations between adverse childhood experiences and adult depression in rural Uganda

Betty Namara¹, Emily Satinsky², Bernard Kakuhihikire¹, Charles Baguma¹, Justin D. Rasmussen², Dagmar Vořechovská², Scholastic Ashaba¹, Christine E. Cooper-Vince², Jessica M. Perkins³, David R. Bangsberg⁴, Alexander C. Tsai^{2,5}

¹Mbarara University of Science and Technology, Mbarara, Uganda, ²Massachusetts General Hospital, Boston, Massachusetts, United States of America, ³Peabody College, Vanderbilt University, Nashville, Tennessee, United States of America, ⁴Oregon Health Sciences University–Portland State University School of Public Health, Portland, Oregon, United States of America, ⁵Harvard Medical School, Boston, Massachusetts, United States of America

Abstract

Adverse childhood experiences include early traumatic events that may put an individual at risk for negative outcomes throughout their lifespan. Some such experiences include physical, sexual, or emotional abuse; witnessing violence; and experiencing divorce/separation or death of a parent. Relationships between adverse childhood experiences and poor mental health, including problematic substance use, depressive episodes, suicide, and other adult psychiatric disorders, have been described; these effects may be cumulative, whereby individuals who experience more adverse childhood experiences are at a greater odds of developing mental health conditions as adults. Research from sub-Saharan Africa indicates a high prevalence of childhood adversity, and research from Uganda illustrates a high prevalence of probable depression (17.4-29.3%). This study aimed to examine associations between adverse childhood experiences and probable depression among 1,626 adults in Nyakabare Parish in southwestern, rural Uganda. We used linear regression to test for associations between the number of adverse childhood experiences (out of a total 16) and depressive symptomology and logistic regression to test for associations with probable depression. In both models, we adjusted for gender, age, marital status, primary education completion, HIV status, and household wealth. Over three-quarters of the sample had experienced at least one adverse childhood experience before age 18 (77.67%, $n=1,263$), with an average of 4.67/16 events per person. 20.42% of the sample had probable depression ($n=332$). After adjusting for covariates, the total number of adverse childhood experiences was associated with higher overall depressive symptomology (Beta = 0.035, $p<0.0001$) and increased odds of probable depression during adulthood (OR: 1.211, 95% CI 1.165-1.258). These findings can inform the development and implementation of policies and programs that safeguard children, promote health, and prevent trajectories toward psychosocial disability.

Keywords: *adverse childhood experiences, depression, rural Uganda*

Alzheimer's disease and Related Dementias: A Qualitative Assessment of Perceived Training Needs of Primary Healthcare Providers in Rural South western Uganda

¹Clara Atuhaire, ¹Celestino Obua, ¹Godfrey Z. Rukundo, ²Jessica E. Haberer, and ¹Edith K. Wakida

¹Mbarara University of Science and Technology

²Center for Global Health, Massachusetts General Hospital - MGH

Abstract

Alzheimer's disease and related dementias (ADRD) are the third leading cause of years lived with disability, yet patients presenting with ADRD rarely receive proper care at primary healthcare centres (PHC). PHC providers are expected to be at the frontline of ADRD care and are often the first point of contact for patients with concerns about cognitive function; however, PHC providers may not have the knowledge and skills required to deliver person-centred care to patients. We therefore sought to identify the perceived training needs of PHC providers in recognizing, managing, and referring people with ADRD. This study was a cross-sectional qualitative study that was conducted in four districts in south western Uganda (Mbarara, Isingiro, Rukungiri, and Kabale). A semi-structured interview guide based on the WHO guide (toolkit) for community-based management and care of people with dementia was used to collect data from PHC providers (medical officers, clinical officers, nurses and midwives). The key training needs identified included awareness about ADRD among the PHC providers, knowledge on how to recognise, diagnose, manage and refer people with ADRD and in-service continuous medical education for ADRD, which would in turn lead to improved PHC providers' attitude towards elderly people with ADRD. **Discussion:** Results from the study show a lack of knowledge and inability to identify, diagnose and care for people with ADRD by PHC providers at HC III and HC IVs in rural South Western Uganda. However, The Kyoto Declaration of Alzheimer's Disease International (ADI) provides sufficient guidelines for streamlining dementia care in the primary healthcare system in low- and middle-income countries, which can be operationalized using the WHO toolkit. The lack of knowledge by PHCPs in rural south-western Uganda in identifying and managing persons with ADRD is an indication of the need to provide in-service training to improve the identification and management and sensitization of patients with signs of dementia.

Key words: *Alzheimer's disease, dementia, training needs, primary healthcare providers*

Intrapartum factors associated with fresh still births at Mbarara regional referral hospital

Ojara Sande, Mugisha Julius, Wasswa Gm , And Lugobe Henry Mark

Abstract

Fresh stillbirths remain a global problem with a devastating experience to many families. In Uganda, the incidence is higher than the target of less than 12 fresh still births per 1000births by year 2030 as set under millennium development goals. The objective of this study was to identify intrapartum factors associated with fresh stillbirths at Mbarara Regional Referral Hospital. Unmatched case-control study, with 40 mothers who had fresh stillbirths as cases and 80 mothers who had live births as controls. All the study participants were postnatal mothers who had presented with a detectable foetal heart sound during labour at Mbarara Regional Referral Hospital. Each case was consecutively sampled with two unmatched controls randomly. The groups were compared for factors associated with fresh stillbirth using Fisher's exact test. Statistically significant factors at bivariate analysis were entered using multivariate logistic regression to assess for confounding and effect modification at 95% confidence interval with p-value of < 0.05. Of the 120 participants, 40 mothers were cases, of which 33(82.5%) were referred. 19 of the 33 (57.5%) cases had come from health centre IV. The following intrapartum factors were independently associated with fresh stillbirth after multivariate analysis: multiparous aOR 28.3(95% CI:1.6-512), p-value 0.024, intrapartum decision making > 30 minutes aOR 9.3(95% CI: 1.3-65), p-value 0.027, intrapartum complication aOR 16(95% CI: 2.5-99.9), p-value 0.003. Prompt management of intrapartum complications, timely intrapartum decision making within 30min from admission and improving intrapartum maternal care for multiparous mothers who are a high-risk group are modifiable factors that can help reduce the risks associated with fresh stillbirths.

Key: fresh stillbirth, intrapartum, factors, complications, decision

Family influence on women decision seeking maternal health services during antenatal and delivery

Hadija Swai² Sylvia Tinka¹, Victoria Yohani¹, Maendeleo Boniphace¹, Rose Laisser¹, Dismas Matovelo^{1*}, Tumsifu Matutu³, Hannah Mercader⁴, Jenn Brenner⁴, Jenna Mitchell⁴.

¹Catholic University of Health and Allied Sciences (CUHAS-Bugando), ²Bugando Medical Centre, ³Agriteam Health Tanzania, ⁴University of Calgary.

Abstract

Globally almost all maternal deaths are from developing countries of which Sub-Saharan countries is leading. Maternal deaths related to pregnancy and childbirth under poorest parts of the world is high counting the ratio of 1:6. In Tanzania Maternal deaths are high counting to 556/100,000 live births annually. Attendance to antenatal care and health facility delivery is important to improve pregnancy outcome for a mother and a baby. Studies reported that women decision to attend for health care during pregnancy and at delivery is influenced by other family members who have more power over them. Mothers in law and male partners have been reported to influence women decision in accessing Antenatal care and health facility delivery. We conducted 8 focus group discussions; (five for women and three for husbands), and 6 In-depth interviews were conducted with purposively selected informants who were women and men of 18 years old to 49. All Interviews were audiotaped, transcribed, translated into English language for all the research team to access the data and thematic analysis was done through Nvivo version 12. Women decisions in access to Antenatal care and health facility delivery are influenced by family factors. Majority fail to make decision themselves as they don't have autonomy and their husband have power over them. The following factors come out in this report; Men have the final say on family economy and holders of economy. Men have to pay for women essentials during clinic and delivery which men deny, Women lack psycho-social and emotional support as men denial to escort them to the facility as and hence women are returned home, men have multiple partners hence they fail to support their wives and partner's readiness to support women. Some women decide not to go to the facility for Antenatal care or delivery as the result of men denial. In other side some family members have positive influence to women to seek for health care during Antenatal care and delivery. Mothers in law, sisters, and other family member have been of more support. Empowering women in social, economic and decision making, will help them to benefit to access of health care, and help them to have equity in rural and poor economic status, is key to better pregnancy and child health outcome.

Key words: *Women decision, Antenatal, Delivery*

Healthy families program – integrating safer conception into HIV care

Mwebesa Bosco Bwana, Angela Kaida, Esther Atukunda, **Kato Kalyebara Paul**, Owembabazi Moran, Deo Tukwasibwe, Alice Najjuma, Jeanne Marrazzo, David Bangsberg, Christina Psaros, Cynthia Young, Pooja Chitneni, Jessica Haberer, Craig Hendrix, Winnie Muyindike, Lynn T. Matthews

Abstract

About 53,000 new HIV infections occur annually in Uganda. Half (26,000) of these new HIV infections occur among heterosexual women of reproductive age. HIV negative women in sero-discordant relationships may acquire HIV while attempting to conceive and bear children. In Uganda nearly half of men living with HIV have an HIV-uninfected partner with whom they desire to have children. A safer conception program aims at enabling sero-discordant couples meet their reproductive goals of having children with minimal or no risk of HIV transmission / acquisition. Since November 2016, we have been implementing a safer conception program at ISS clinic of MRRH. The interventions used to prevent peri-conception HIV transmission include: Couple HIV Counselling and Testing, Screening and treatment of STIs, Use of condoms until viral suppression, timed unprotected intercourse at peak fertility, Highly Active Antiretroviral Therapy (HAART) for the HIV positive partner, Pre-exposure prophylaxis (PrEP) for the HIV negative partner at risk, and Manual Artificial Insemination. Achievements include: Consultations: 1,363. Clients planning pregnancy: 347 [Males – 188 (54%), Female – 159 (46%)], Provided PREP to 122 clients, achieved 60 pregnancies, 40 babies (including 1 set of twins), All babies – HIV negative, 2 women seroconverted and were linked to HIV care. Treated for STIs after testing positive: 56, in cooperated a research arm into clinical care program with 3 ongoing studies. HIV negative clients experience internal and external stigma when a safer conception clinic is operated within an HIV clinic. A safer conception clinic requires additional physical infrastructure. Non-disclosure of HIV sero-status is prevalent among sero-discordant couples and could undermine safer conception initiatives. Gender based violence affects adherence to safer conception methods. Infertility among sero-discordant couples creates frustration and lowers adherence to safer conception strategies. There is demand for safer conception services and it is practical to integrate safer conception into HIV care. Safer conception services should be introduced into other HIV clinics in Uganda. Health care systems should be strengthened to manage gender based violence and infertility to prevent HIV through safer conception.

Key words: *HIV, PrEP, safer conception*

Referral Practices by Community Health Workers for Childhood Illnesses at Community Level: A Five Year Trend

Michael Matte^{1,2*}, Moses Ntaro¹, Geren Stone³, Palka Patel^{3,4}, Raquel Reyes⁵, Daniel Guiles^{3,6}, Andrew Christopher Wesuta^{1,2}, Shem Bwambale^{1,2}, Baguma Stephen^{1,2}, Peter Chris Kawungezi¹, Fred Bagenda¹, Edgar Mulogo¹

¹Mbarara University of Science and Technology, P.O. Box 1410, Mbarara.

²Bugoye Health Center III, P.O.BOX 149 Bugoye, Uganda.

³Massachusetts General Hospital Center for Global Health, 125 Nashua Street, Suite 722, Boston, MA 02114, USA.

⁴Indiana University, School of Medicine, USA.

⁵University of North Carolina, School of Medicine, Department of Medicine, Division of Hospital Medicine, USA.

⁶Vanderbilt University, Vanderbilt Health, Nashville Tennessee, USA.

Abstract

Malaria, Diarrhea and Pneumonia have remained prevalent among children under five years of age and are a leading cause of morbidity and mortality in the Sub-Saharan Africa. This paper assesses practices associated with pre-referral treatment of children under five provided by volunteer Community Health Workers. Secondary data was collected retrospectively and reviewed by the program team for the study period starting March 2014 to December 2018. Using Stata 12, the factors associated with pre-referral treatment were evaluated. Bivariate analysis using odds ratios were reported. Multivariate analysis was performed to identify variables independently associated with pre-referral treatment. Of the 21,441 children under five, 64% were above 12 months of age with a mean age of 27.7 months (SD=17). Children presenting with fast breathing (aOR = 0.5, 95%CI: 0.35-0.77, $p<0.01$) and visitation within the first 24 hours (aOR = 0.6, 95%CI: 0.44-0.92, $p<0.05$) were less likely to be given pre-referral treatment by Community Health Workers. However, children presenting with danger signs (aOR = 11.1, 95%CI: 7.06-17.34, $p<0.001$) and referred children (aOR = 32.1, 95%CI: 20.16-51.06, $p<0.001$) were more likely to be given pre-referral treatment by Community Health Workers. Uganda Ministry of Health and World Health Organization protocols have guided recommendable practices among Community Health workers to ably manage cases of Malaria, diarrhea and pneumonia and offer pre-referral treatment compliantly. For the world to appreciate the unique contribution of community health workers, a robust and sustainable approach should be embedded in the current health structures.

Keywords: Pre-referral treatment, Community Health Worker, World Health Organization

Treatment supporters and level of health facility influence completion of sputum smear monitoring among tuberculosis patients in rural eastern Uganda: a mixed-methods study

¹Jonathan Izudi, ¹Imelda K Tamwesigire, ¹Francis Bajunirwe

¹*Department of Community Health, Faculty of Medicine, Mbarara University of*

Abstract

Bacteriologically confirmed pulmonary tuberculosis (BC-PTB) patients require three sputum smear follow up tests to monitor response to treatment. The frequency of this monitoring and associated factors in resource limited settings are not well-known. We investigated whether treatment supporters influence completion of sputum smear monitoring (SSM) among adult BC-PTB patients, and explored reasons for incomplete SSM from healthcare workers, TB patients and their treatment supporters' perspectives. We used a mixed-methods study design. Quantitative data were abstracted from TB unit registers while qualitative data were obtained through key informant interviews with healthcare workers, and in-depth interviews with TB patients and their treatment supporters. Quantitative data were entered in Epi-Data and analyzed with Stata. Qualitative data were transcribed verbatim and analyzed using thematic content approach. We abstracted records for 817 patients and of these, 226 (27.7%) completed SSM. Factors independently associated with completion of SSM included having a treatment supporter (adjusted risk ratio (ARR), 2.40; 95% Confidence Interval (CI), 1.23-4.70), district (ARR, 1.61; 95% CI, 1.04-2.49) and regional referral hospital (ARR, 2.00; 95% CI, 1.46-2.73) compared to Health Center IV (sub-county) facility level, and every additional year since 2015 (ARR, 1.29; 95% CI, 1.17-1.43). The reasons for incomplete SSM related to health systems, patients, treatment supporters, and healthcare providers factors. Completion of SSM was low in rural eastern Uganda. Treatment supporters positively influence completion of SSM. Higher level facilities are more likely to complete SSM compared to the lower ones. Patients should be encouraged to engage treatment supporters.

Fractional dose Yellow Fever Vaccines for outbreak response

Caroline Nerima^{1,2}, Mateus Kambale¹, Edgar Mulogo², Juliet Mwanga Amumpaire*^{1,2}

¹Epicentre Mbarara Research Centre

²Mbarara University of Science and Technology

Abstract

Yellow fever (YF) vaccine supply for outbreak response is limited. In 2016, large urban YF outbreaks occurring concurrently in different parts of Africa and the risk of further spread led WHO to develop recommendations for use of fractional dose vaccination as a dose-sparing strategy. We are conducting a trial in Mbarara, Uganda and Kilifi, Kenya, to assess the applicability of fractional dose of all four WHO-prequalified YF vaccines and the performance of fractional dose in young children and populations with HIV.

Methods: This is a double blinded, randomized, non-inferiority trial. Fractional dose was defined as 1/5th of a standard dose. Unvaccinated adults were randomly assigned to vaccine manufacturer and dosage (standard or 1/5th) and seen 10 days, 28 days and 1 year post-vaccination for immunogenicity and safety assessment. The primary objective is non-inferiority in seroconversion, with a 10% margin, of a fractional dose compared to standard dose for each pre-qualified vaccine at 28 days post-vaccination, measured by PRNT50. Sub-studies on children and HIV+ adults are ongoing with one vaccine. A total of 1029 adult participants were screened and 960 vaccinated (240 per manufacturer and 120 per dose). Overall, 55.1% of participants were female and mean age at enrollment was 35.7 years. At baseline, 5.1% participants were positive for yellow fever by PRNT50. Baseline characteristics were not significantly different between standard and fractional dose groups for each manufacturer. At 28 days post-vaccination 99.4% participants seroconverted. The maximum difference between fractional and standard dose group was -5.4%. Fractional dose of YF vaccine meets non-inferiority criteria for all pre-qualified manufacturers 28 days after vaccination. There were no safety concerns of the reduced dose. Results are pending to evaluate the rapidity of protection (10 days follow-up) and the persistence of antibodies at 1 year post-vaccination.

Key words: *Emergencies, Fractional doses, Yellow fever Vaccines*

Use of Modified Early Warning Score to identify Critically Ill patients at a University Teaching Hospital in South Western Uganda

Raymond Tumwesigye^{1,5*}, Richard Migisha¹, Michail Zografakis Sfakianakis², George Kritsotakis², Sara Groves³, Vallengence Niyonzima⁵

¹Department of Physiology, Mbarara University of Science & Technology

² Department of Nursing, Hellenic Mediterranean University, Heraklion, Greece

³Department of Public health, Johns Hopkins University, Baltimore, USA

⁵Department of Nursing, Mbarara University of Science and Technology, Uganda

Abstract

A Modified early warning score (MEWS) is a bedside track and trigger scoring system that is used to measure the vital signs and other clinical indicators to identify very sick and unstable patients. The study examined the ability of MEWS to identify the critically ill patients on medical ward at Mbarara Regional Referral Hospital and to determine the association between MEWS score and the medical diagnosis. A descriptive cross-sectional study was conducted on 64 patients on medical ward at Mbarara Regional Referral Hospital (July, 2019). We included all adult patients aged 18 years and above and excluded patients without a clear medical diagnosis and all those whose medical files were not be available/traceable. We collected demographic characteristics and vital signs, and computed MEWS from 6 physiological parameters; Patients diagnoses were captured from the patients' admission charts. Of 64 patients, the mean age was 48.5(SD18.88) (range, 17-90) years, with equal number of male and females 32(50%). MEWS ranged from 0-12, with mean: 4.79(SD 2.65). Half of the respondents had a critical illness with a high MEWS ≥ 5 and a Pearson's chi-square test $X^2(18) = 18.12$, $p=0.448$ revealed that there was no relationship between medical diagnosis and the MEWS score. This tool is useful in identifying critically ill patient who need immediate interventions. This study confirmed that MEWS is an important tool that can be used to identify critically ill patients based on vital observations. Implementation of MEWS as a track and trigger monitoring system could provide a useful triage tool to identify patients at greatest risk of death. Formulation of MEWS algorithms, could assist the health care team to initiate appropriate interventions and care to patients basing on the key indicators of MEWS.

Key Words: Modified Early Warning Score, Critically ill, track, trigger, Monitorin

Optimizing mHealth for adherence monitoring and intervention- initial experiences

Edna Tindimwebwa*¹, John Bosco Tumuhairwe¹, Robert Bajjuka¹, Lindsey Garrison², Stephen Asimwe^{1,2,3}, Jessica Haberer*²

¹Kabwohe Clinical Research Centre, ²Massachusetts General Hospital, ³Mbarara University of Science and Technology

Abstract

High, sustained adherence is critical for achieving individual and public health benefits of HIV antiretroviral therapy (ART). Electronic monitors provide detailed adherence data and enable real-time interventions, but application has previously been limited to research. We present an implementation science-driven study to assess uptake of a novel, low-cost electronic adherence monitor and associated interventions for routine care. The evriMED monitor provides a real-time date-and-time stamp of device openings for pill-taking, which can be used for tailored counseling and/or SMS reminders/notifications. Following formative interviews that defined our implementation strategy, we deployed the monitor and associated interventions in routine care over 3 months per participant. Of 25 ART clients enrolled, 24 completed follow-up. Half had recently initiated ART, 60% were male, and the average age was 38 years. The median CD4 count was 461 cells/mm³; 88% were virally suppressed. All ART clients had social supporters; 50% were women with an average age of 41. Clients chose the following interventions: 20% daily SMS, 68% SMS triggered by a missed/delayed device opening, and 12% chose both. Three (12%) devices had faulty batteries. SMS was limited initially by “anti-SPAM” legislation. Clients had a median of 2 clinic visits during follow-up; 88% reported that counsellors reviewed their adherence data during 1+ visits. Overall average adherence was 91%; 4 clients had adherence gaps of 1+ weeks. Acceptability was high. Time and motion studies indicated that triage nurses had flexibility to manage the technology. Routine clinic visits lasted a median of 48 minutes versus 55 minutes when using the monitor and associated interventions, largely due to increased counselling. In a prototypical clinic, we successfully implemented a low-cost electronic adherence monitor and associated interventions among most clients. Adherence was generally high, although individuals were identified who could benefit from intervention. Overall clinic flow was minimally affected.

Community-based management and care of people with dementia: A training needs assessment among village health teams in Uganda based on WHO guidelines

Christine Karungi, Celestino Obua, Godfrey Z. Rukundo, Samuel Maling, Jessica E. Haberer, and Edith K. Wakida

Abstract

Dementia is a public health problem worldwide with approximately 47 million people living with the disease. Although the symptoms are known and named, dementia remains a hidden problem in low and middle income countries (LMICs) as most people perceive it be a normal aging process. In a bid to improve healthcare, the Uganda government adopted a model of recruiting community-based health assistants known as village health teams (VHTs). These individuals helped in linking the community health units with community members with a goal of promoting health services. However, there is paucity of information about how the VHTs provide community-based management and care for people with dementia and their ability to perform the task. The purpose of this study was to identify the training needs of the VHTs in caring for people with dementia in rural communities of southwestern Uganda. This study utilized a cross-sectional qualitative design conducted with the help of semi-structured interview guide. The WHO guide was adopted in developing interviews on dementia care and management in LMICs. VHTs reported the need for training with specific to dementia care to equip them with knowledge and skills on early detection and management, care and referral system. Results also show that VHTs were not able to detect dementia early since they perceive it as normal aging process. There was no community engagement in helping people with dementia since most people in the community do not take dementia to be a medical condition. Also there was little support for dementia in these areas as VHTs only referred people with dementia to health facilities in an event of physical ailment. Other organisations like churches only offered prayers only to the aged persons who are very close to the church. The study found that there is an urgent need for training VHTs on caring for individuals with dementia in rural communities of southwestern Uganda. The identified gaps helped in designing the strategies for capacity building through training of VHTs on dementia care in rural communities of southwestern Uganda.

Keywords: *Community - based management; Dementia; Training Needs*

Assessing 4 years (2015-2018) trend of under-five malaria case load at the seven health facilities within Bugoye sub county, Kasese district of western Uganda

Mbaju Jackson*^{1,3}, Andrew Wesuta Christopher, Nobert Mumbere, Michael Matte^{1,4}, Jessica Kenney^{1,5}, Shem Bwambale^{1,3}, Moses Ntaro^{1,4}, Geren Stone^{1,5}, Edgar Mugema Mulogo^{1,4}

¹[*Department of Community health, Mbarara University of Science and Technology*](#)

²[*Center for global; health Massachusetts general hospital 125 Nashua street Boston Ma 02114*](#)

Abstract

The control of malaria is important for the reduction in the rate at which the under-fives fall sick or even die. Uganda has adopted the integrated community case management strategy using village health workers (VHTs) to address this challenge. It is not well documented to how much extent the efforts of VHTs has reduced the level of malaria disease case load at the health facilities of Bugoye Sub county. Therefore, this study establishes four years trend of Malaria case load starting from January 2015 to September 2018 in the seven health facilities in Bugoye Sub county, Kasese District-Western Uganda. The study objective was to quantify health Centre clinical performance in reference with under five community case management by VHTs specifically treating Malaria. The study was a retrospective review of the under-five Malaria data recorded in the OPD registers during regular children assessment and treatment at the 7 health facilities in Bugoye Sub county. Malaria, diarrhea and pneumonia cases of under-fives received at the Health facility on a daily basis are recorded in OPD registers. These archived registers provided the data sources for this research which was collected in ODK software and was exported to MS Excel 2016 for analysis. Of all the 15,851 iCCM cases recorded in the past four years (2015-2018) in the 7 health facilities, malaria cases were 6281 (39.6%) of which 31% was realized in 2015, 32% in 2016, 27% in 2017 and 10% in 2018. 3,319 cases of diarrhea were captured in the past 4 years. 26% of these cases were captured in 2015, 29% in 2016, 27% in 2017 and 18% in 2018. 6,251 pneumonia cases were registered over the past 4 years in the 7 health facilities. Of these pneumonia cases, 39% was captured in 2015, 30% in 2016, 21% in 2017, and only 10% in 2018. However, considering the BCHC VHT iCCM data for the past 4 years (2015-2018), there was a rise in Malaria cases from 14.3% in 2015 to 36.1% in 2017. However, the trend declined to 24.3% in 2018. Although there is a slight rise from 2015 to 2016 for all the three conditions, the results still reveal that there is a steady decline in the trend of malaria case load from 2016 to 2018 at all the 7 health facilities in Bugoye Sub County. This decline is attributed to the fact that VHTs have done a significant contribution in treating the under-fives in Bugoye Sub County, thus leading to health facility load case reduction.

Key words: *Bugoye Community Health Collaboration (BCHC), Integrated Community Case Management Initiative (iCCM), Village Health Worker(VHT)*

SUBTHEME: Collaborative innovations for health science for healthcare delivery and reduction of disease burden

The efficacy and safety of *Momordica charantia* L. in animal models of type 2 diabetes mellitus; A systematic review and meta-analysis

Emanuel L. Peter,^{1*} Prakash B. Nagendrappa,² Anita Kaligirwa,³ Patrick Engeu Ogwang,¹ Crispin Duncan Sesaaazi^{1,4}

¹ Pharm-biotechnology and traditional medicine center of excellence (PHARMBIOTRAC), Mbarara University of science and technology, Mbarara, Uganda

² Centre for local health traditions & policy, Trans-disciplinary University (TDU), Bengaluru, India.

³ Department of Pharmacology, faculty of medicine, Mbarara University of science and technology, Mbarara, Uganda

⁴ Department of Pharmaceutical science, faculty of medicine, Mbarara University of science and technology, Mbarara, Uganda

Abstract

People with Type 2 diabetes mellitus are increasingly using *Momordica charantia* L. (Cucurbitaceae) to control hyperglycemia because of its ability to alleviate insulin resistance, beta-cell dysfunction, beta-cell mass, and increase serum insulin level. However, a meta-analysis of clinical trials confirmed very low-quality evidence of its efficacy which could indicate the existing challenges in translating animal studies to clinical practice. To evaluate the effect of *M. charantia* L. in comparison with vehicle on glycemic control in animal models of type 2 diabetes mellitus. Review authors searched in MEDLINE, Web of Science, Scopus, and CINAHL databases without language restriction through April 2019. Two authors independently evaluated full texts, assessed the risk of bias, and extracted data. The influence of study design and publication bias were also analyzed. The review included 66 studies involving 1861 animals. They had a follow up between 7 and 90 days. Majority 29 (43.9%) used Wistar albino rats, and 37 (56.1%) used male animals. Thirty-two (48%) used an aqueous extract of fresh fruits. *M. charantia* L. reduced fasting plasma glucose (FPG) and glycosylated hemoglobin A1c in comparison to vehicle control (42 studies, 815 animals; SMD, -6.86 [95% CI; -7.95, -5.77], 3 studies, 59 animals; SMD; -7.76 [95%CI; -12.50, -3.01]) respectively. Magnitude of FPG was large in Wistar albino rat subgroup; SMD; -10.29, [95%CI; -12.55, -8.03]. Publication bias changed FPG to non-significant -2.46 SMD, [95%CI; -5.10, 0.17]. The extract has hepato-renal protective effect at varying dose and duration of administration *M. charantia* L. lowers elevated plasma glucose level in type 2 diabetes mellitus animal models. Publication bias and poor methodological quality call for future researches to focus on standardizing dose with chemical markers and provide measures to improve preclinical type 2 diabetes mellitus studies.

Hypertension and Diabetes mellitus in Kibiito town council, Kibiito sub-county, Bunyangabu district, south western Uganda: promoting awareness and service utilization

Winnifred Among¹, Maria Amanda Namugumya¹, Ronald Nuwasiima¹, Henry Bbaale¹, Benon Ambasiize¹, Elias masereka¹, Wilfred Arubaku*² 1 MUST faculty of Medicine-Health professional student 2 Senior Lecturer, MUST faculty of Medicine

Abstract

A team of 6 inter-disciplinary health professional students from faculty of medicine; Mbarara University of Science And Technology who were immersed in the community for COBERS undertook a community leadership project to address a major health challenge of Hypertension and Diabetes mellitus in Kibiito Health centre 4 in Kibiito Town council during a 7 week placement program. The purpose of this project was to promote awareness about the causes, risk factors, complications and preventive measures of Hypertension and Diabetes mellitus and to promote utilization of Hypertension and Diabetes health care services at Kibiito Health centre 4 in Kibiito Town council. Implementation science methodology was utilized to achieve our aims. Results show hypertension and diabetes mellitus were identified among major health challenges in Kibiito Town Council besides inadequate knowledge about Hypertension and Diabetes in the community. More still Community members had a negative attitude about seeking medical attention for hypertension and diabetes because of erratic drug supplies. We also established that overall the prevalence of hypertension in Kibiito is 21.05% and diabetes is 3.9%. We therefore conclude that despite high prevalence of Hypertension and Diabetes in this rural community, knowledge is limited and health seeking practices are poor. We hence recommend a deliberate and sustained effort to promote health education to improve health outcomes in the community.

Key words: *Diabetes, Hypertension, health professional, inter-disciplinary*

Effect of pineapple pulp fiber-enriched wheat flour on hyperlipidemia and oxidative stress in diabetic male wistar rats

Joash Okoboi^{1*}, Joseph Oloro¹, Grace R. Kagoro¹, and Gertrude N. Kiwanuka¹

¹Department of Biochemistry, Mbarara University of Science and Technology.

Abstract

Poorly controlled diabetes leads to complications such as oxidative stress and dyslipidemia both of which are risk factors for cardiovascular disease and are mediated by persistent hyperglycemia. Dietary fiber and diets rich in polyphenolic compounds, such as pineapple pulp fiber are thought to be important strategies to counter hyperglycemia, oxidative stress and dyslipidemia. The aim of the study was to determine the effect of pineapple pulp fiber-enriched wheat flour on hyper-lipidemia and oxidative stress in diabetic male wistar rats. Wheat flour was enriched with pineapple pulp fiber (PPF) and its total flavoanoid content, total polyphenol content and ferric reducing antioxidant power determined. Twenty male wistar rats (95.5-161.5) g were divided in four groups of five and diabetes was induced in three of these groups using alloxan (150mg/Kg in normal saline). The treatment group was fed on 10% PPF- enriched wheat, the positive control was fed on ordinary wheat and supplemented with vitamin C, the Negative control and Normal control were fed on ordinary wheat. Fasting blood glucose was measured every three days of the experiment for fourteen days. On the last day, rats were sacrificed and plasma, serum and liver taken for analysis of FRAP, HDL, LDL, TGs and total cholesterol. MDA and GSH were determined using quantitative ELISA assays. PPF-enriched wheat significantly increased TPC($p<0.01$), TFC ($p<0.01$) and ferric reducing antioxidant activity ($p<0.01$). Induction of diabetes led to increase in blood glucose and MDA concentration and reduced FRAP and concentration of GSH. Feeding on PPF-fortified wheat significantly increased FRAP ($p=0.057$), GSH($p=0.081$) and reduced MDA ($p=0.01$). Glucose and lipid profile results were not significant. 10% PPF-fortified wheat significantly increases the antioxidant capacity of the flour and has protective potential on hyperglycemia induced oxidative stress. We recommend it for use in improving antioxidant properties of wheat flour.

Key words: *antioxidants, dietary fiber, diabetes, oxidative stress*

Effect of red cabbage leaf extract on the onset of insulin resistance in high-fat fed wistar rats

Nathan Kakongi^{1*}, Paul Alele² and Gertrude Kiwanuka³

^{1,2,3}Mbarara University of Science and Technology, Mbarara,

Abstract

Insulin resistance (IR) is a requisite precursor for the development of type 2 diabetes mellitus (T2DM) and there is no curative medicine for this disease. Red cabbage has been reported to contain anti-diabetic flavonoids, but there is not much data to validate this claim and explore its importance. Objective: To determine the effect of red cabbage leaf extract (RCLE) on blood glucose levels, onset of IR in high-fat-fed Wistar rats and GLUT4 gene expression. Extraction of RCLE was done using acidified ethanol. Twenty-four male Wistar rats (120-200g) were used. A high fat diet and dexamethasone were used to induce IR and intervention using RCLE treatment at two doses; 1g/kg BW/day (high dose) and 0.5g/kg BW/day (low dose) for 14 days. Bodyweight, fasting blood glucose levels, HOMA-IR values for assessment of IR and qPCR for GLUT4 gene expression were measured. Results were analyzed using One-Way-ANOVA. Administration of RCLE resulted in low bodyweight gain (4g) compared to controls; IR-induced untreated (HF-C) (12g) and normal controls (NC) (52g). Hyperglycemia developed first in HF-C group (6.7mmol/l), then RCLE treated low dose (HF-LD) (8.8mmol/l) and high dose (HF-HD) (8.4mmol/l), in that order. On day 15, HF-LD showed higher anti-hyperglycemic effect (6.7mmol/l) while HF-C group increased sharply to 9.5mmol/l. HOMA-IR values for NC, HF-C and HF-LD groups were 1, 1.500±0.33 and 1.105±0.21 respectively but lacking statistical significance. GLUT4 mRNA levels of rats in HF-LD showed similar level of 1-fold expression as NC group but 0.4-fold expression for HF-C group. RCLE prevented weight gain in male Wistar rats on a high-fat diet, and may play a role in delaying onset of hyperglycemia and insulin resistance, possibly through maintaining normal expression of Glut4 mRNA levels. Further studies are necessary to determine the active ingredients in RCLE that are responsible for the observed effects.

Key words: *Fasting blood glucose, GLUT4 gene expression, hyperglycemia, insulin resistance, red cabbage leaf extract.*

Awareness, Perceptions and Attitudes towards Cervical cancer and Cervical cancer screening among female Students at Mbarara University of Science and Technology, Uganda: A quantitative Study

Wasswa William¹, Schola Ashaba², Jerome Kabakyenga (PhD)³

¹Department of Biomedical Sciences & Engineering, Mbarara University of Science & Technology,

²Department of Psychiatry, Mbarara University of Science and Technology, Mbarara, Uganda,

³Maternal Newborn and Child Health Institute, Mbarara University of Science and Technology, Uganda

Abstract

Globally, cervical cancer ranks as the fourth most frequent cancer in women with an estimated 570,000 new cases in 2018, representing 6.6% of all female cancers. Approximately 90% of deaths from cervical cancer occur in low and middle income countries with Uganda ranked 7th among the countries with highest incidences of cervical cancer in Africa. However, cervical cancer can be prevented through regular screening. Over 85% of those diagnosed with cervical cancer in Uganda die and this is attributed to late diagnosis due to lack of awareness of the disease, and available treatment and diagnostic options and limited access to screening and health services in most settings. We assessed the level of awareness, perceptions, and attitudes towards cervical cancer and cervical cancer screening among female students at Mbarara University of Science and Technology. In a quantitative cross-sectional study, a sample of 512 female students including those from the Faculty of Medicine, Faculty of Science, Faculty of Computing & Informatics, Faculty of Applied Sciences & Technology, Faculty of Business & Management Sciences, and Faculty of Interdisciplinary Studies were interviewed using a self-administered questionnaire. Response rate was 98% (500). Of these 82.4% were aware of cervical cancer screening and knowledge about pap-smear was 37.6% of which the highest (94.0%) was in Faculty of Medicine and least (21.9%) in Faculty of Business and Management Sciences. Almost half (48.0%) of the respondents had never been screened for cervical cancer and majority of these (33.0 %) were from Faculty of Computing and Informatics. Of those who have been screened, (50.2 %) reported to seek reproductive health from private clinics and 68.9 % of the respondents preferred to be screened by same sex health care service provider. Awareness of cervical cancer and cervical cancer screening was high among the study participants. However, few of them had taken up screening services. Targeted interventions including increasing sensitization about pap-smears and where the services can be obtained can translate the high levels of awareness of cervical cancer screening into actual benefits.

Social norms and adherence to ART: a population-based study of persons with HIV in rural Uganda

Justus Kananura¹, Jessica M. Perkins², Bernard Kakuhikire¹, Charles Baguma¹, Justin D. Rasmussen³, Carolyn M. Audet⁴, Mark J. Siedner^{1,5,6}, Jessica E. Haberer^{5,6}, David R. Bangsberg^{1,7}, Alexander C. Tsai^{1,5,6}

¹Mbarara University of Science and Technology, Mbarara, Uganda, ²Peabody College, Vanderbilt University, Nashville, TN, USA, ³Duke University, Durham NC, USA, ⁴Vanderbilt Institute of Global Health, Vanderbilt University Medical Center, Nashville, TN, USA, ⁵Harvard Medical School, Boston, MA, USA, ⁶Massachusetts General Hospital, Boston MA USA, ⁷Oregon Health & Science University-Portland State University School of Public Health, Portland, OR, USA

Abstract

The perception of health behaviors as normative is a known determinant of one's own propensity for such behaviors. It is unknown, however, whether people living with HIV (PLWH) accurately perceive antiretroviral treatment (ART) adherence norms and whether that perception influences their own adherence. We recruited a population-based sample of adult PLWH on ART in Nyakabare Parish in rural Uganda. Adherence was defined as self-reporting no past-week missed doses. Adherence was classified as normative if present among more than 50% of PLWH in the community. Individuals also reported perceptions about the adherence norm by stating how many ART doses most *other* community members missed in the past week. We compared perception of the adherence norm to the actual norm, and assessed the relationship between perception and personal adherence. Adherence was normative among 159 PLWH: only 15% of HIV+ men and 9% of HIV+ women reported missed doses. However, approximately one-half of participants believed that most PLWH in their communities were non-adherent. Furthermore, approximately one-quarter did not know whether most people had missed doses. Thus, only about one-quarter of this population (33% of HIV+ men and 21% of HIV+ women) accurately perceived that ART adherence was normative. Perceiving ART non-adherence as the norm was not associated with age, education, time since diagnosis, or serostatus disclosure. However, there were almost three times as many non-adherents among the participants who misperceived the norm than among participants who accurately perceived the norm (14% vs. 5%), though this difference was not statistically significant. Not knowing the norm increased personal propensity for non-adherence (AOR = 3.6, 95% CI 1.2, 10.8). In this population, many PLWH on ART believe that non-adherence to ART is present among most PLWH on ART in their community despite normative adherence. Future work may involve designing novel adherence interventions to alter community misperceptions.

Keywords: *ART adherence, adherence norms and perceptions, people living with HIV, rural Uganda*

Expanding HIV testing among Ugandan adults who utilize traditional healers: Preliminary results from a randomized controlled pilot study

¹Gabriel Nuwagaba, ¹Juliet Mwanga-Amumpaire and ²Radhika Sundararajan

¹Mbarara University of Science and Technology

²Dept. of Emergency Medicine, Weill Cornell Medicine, New York, USA.

Abstract:

To reach UNAIDS 90-90-90 targets, HIV testing services must be accessible and acceptable within endemic communities. Our prior work in Mbarara has shown that 40% of all adults who seek care from traditional healers are of unknown serostatus, engage in high risk behaviors, and avoid biomedical services. Healers have not been previously incorporated into HIV testing outreaches. Our objective was to expand access to HIV testing by training traditional healers to deliver HIV tests to clients of unknown serostatus. Our study methods followed a cluster-randomized design. We trained nine healers to deliver point-of-care (POC) HIV tests (Oraquick®), and eight healers to deliver a modified standard of care (expedited referral to existing clinic-based testing services). Clients seeking traditional care were eligible if 1) they had not received an HIV test within the prior 12 months; 2) had not previously been diagnosed with HIV; and 3) were aged 18 years or older. All participants agree to be followed for a period of three months post-enrollment, and undergo an exit survey. Preliminary results (as of 31 October 2019) include 212 participants in the intervention arm, and 66 in the control arm. Uptake of HIV testing is markedly higher in the intervention arm. All participants offered testing in the intervention arm received one (100% uptake), compared with 17 of 66 in the control arm (26% uptake). Prevalence of HIV in the intervention arm is 5% (n=10/212); thus far, two among these newly diagnosed participants have linked to HIV clinical care. Based on our findings, we conclude that POC HIV testing delivered by traditional healers to their clients is feasible and acceptable, and that healer clients are a high-risk population in need of testing. We recommend that healers practicing in HIV-endemic regions be engaged as expanders of HIV testing services within their communities.

Key Words: *Community health, HIV testing, Traditional Healers*

Factors Influencing Uptake of Cervical Cancer Screening services in rural Uganda: A qualitative study

Ayebare David Santson¹ Antonia Kamate Tukundane³ Abaasa, Catherine² Anyayo Lucas²Nabukenya Jamilah²,Tuyambe Slyvia¹,Kyarisiima Rose¹, Kyomuhangi Teddy² Anca Matei⁴

¹Director, Interdisciplinary Research & Development Center (IRDC) Ltd

²Mbarara University of Science & Technology

³Palliative care, Hospice – Uganda

⁴Department of Obstetrics & Gynaecology- Dalhousie University, Canada

Abstract

In the light of low uptake of cervical cancer screening services in rural sub Saharan Africa, this study established the factors influencing the low uptake of Cervical Cancer Screening services among women aged 25-49 years who utilize Cervical Cancer Screening services in Sheema district. A total of 6 Focus group discussions (FGDs) were conducted with women and men of aged 25-49 years attending Kitagata Community hospital and Mulago hot spring, one of the nearest rural western Uganda. We conducted 2 mixed gender FGDs, 2FGD with men and 2 women FGDs were conducted. Four interviews with health workers were also conducted. Initial codes, final codes and themes were sequentially developed and used to group themes into the broad outcomes. This involved an iterative process of reading transcripts by three qualitative research experts to identify commonly occurring themes through which the codebook is developed. Of the 41 study participants, majority were married (97.6%) More than half were women (68.3%) with primary education (56.1%), mean age of 37.6 years ($SD = 9.2$) mean age of marriage of 20.8 years ($SD = 5.2$) and mean parity of 4 children earning a mean of 117, 961 Uganda Shillings ($SD= 197,400$). Key findings indicated that majorly patient-related factors and health facility related factors influenced uptake of cervical cancer screening services. Respondents acknowledged lack of knowledge, ignorance of procedure coupled with false tales from previously screened women resulting into fear of the procedure involved in addition to lack of transport to and from the health facility. While at the health facility, women and men were overwhelmed by the unanticipated relatively cheaper cost and availability of cervical cancer screening services despite the fear of an encounter with male health workers that were rude. It is eminent that health authorities and administrators need to take patient's needs into account when making cervical cancer screening services.

Key words: Uptake, cervical cancer screening services, Kitagata community hospital, Sheema District.

Prevalence and factors associated with intestinal parasitic infections among people living along the shores of Lake Kijanebalora, Rakai district

Zziwa Abiyasal and Eleanor Turyakira

Abstract

Globally over three billion people are infected with one or more types of intestinal parasites. People living or working near lake shores in Uganda are at a high risk to a variety of intestinal parasitic infections due to constant contact with contaminated water and poor sanitation. This study was carried out to determine the prevalence and factors associated with intestinal parasitic infections among people living along the shores of Lake Kijanebalora in Kasula Parish, Rakai District. A cross sectional community survey was carried out between May 2019 and June 2019 in the villages along the shores of Lake Kijanebalora in Kasula Parish, Kyalulangira Sub County, Rakai District. Participants were chosen from randomly selected households within the study area and stratified into three age categories namely under-fives, 5-14 years and those 15 years or older. The proportion of the study sample represented by each age-group corresponded with estimated age-specific distribution of the population of Kasula Parish. Participant stool samples were collected and analyzed by microscopy to identify and characterize intestinal parasitic infections. Data on socio demographic and economic characteristics, hygiene and sanitation behavior and practices were collected using a questionnaire. A data set was created by entering data from the questionnaires and the laboratory data collection forms into Microsoft office excel 2007 spread sheet, coded and imported into STATA Version 12 for analysis. Fisher's exact test was employed to determine if differences in prevalence across age categories considered in the study were significant. Logistic regression analysis was employed to identify factors statistically associated with intestinal parasitic infections. Three hundred fourteen (314) participants were studied. The overall prevalence of intestinal parasitic infection was 66.6% [61.3%-71.8%]. Age-specific prevalence was 69.4% for children under 5 years, 67.4% for children between 5-14 years and 65.1% for adults aged 15 years or older. Among the infected participants, 64.1% had protozoa infections only, 20.6% had helminthes infections only, while 15.3% had a combination of helminthes and protozoa infections. Nine species of intestinal parasites were identified of which *Entamoeba histolytica/dispar* was the most prevalent at 40.2%, followed by *Ascaris lumbricoides* at 35.4% and *Cryptosporidium* species at 22.0%. *Entamoeba coli* ranked fourths at 12.9%, *Gardia lamblia* was in the fifth position at 9.1%, *Cyclospora* species occupied the sixth position at 4.3% while hook worms were in the seventh position at 1.9%. *Idoamoebabuetschlii* and *Isosporabelli* were the least prevalent both at 1.0%. Twenty-three percent of infected individuals had multiple species infections. Of these, 16.3% had triple species combinations while 83.7% had double species combinations. The most frequent triple species combination were *Entamoeba histolytica/dispar* + *Cryptosporidium* species + *Ascaris lumbricoides* while the most frequent double combination were *Ascaris lumbricoides* and *Cryptosporidium* species. 45.4% had high or very high degree of

infection. The high prevalence of intestinal parasitic infections among people living along the shores of lake Kijanebalora in Kasula Parish, Rakai District was statistically associated with community members practice of open defecation (aOR:3.28[1.85-5.80]) and eating of raw foods, (aOR:2.44[1.22-4.91]) as risk factors. Having short finger nails (aOR: 0.56[0.33-0.97]), going for medical checkup voluntarily (aOR: 0.33[0.13-0.85]) and purifying drinking water (aOR: 0.34[0.16-0.74]) may reduce one's risk of acquiring intestinal parasitic infections. In the study setting, the prevalence of intestinal parasitic infections is high and protozoa infections are very common. Community member's practice of open defecation, eating of raw foods and long finger nails are risk factors for intestinal parasitic infections, while going for medical checkup voluntarily and purifying drinking water may reduce one's risk of acquiring intestinal parasitic infections. Community sensitization about prevention by Health authorities in the area, inclusion of anti intestinal protozoan treatments into the current de worming strategy, as well as extending the de worming strategy by the Ministry of health Uganda to include all adults, are recommended.

Barriers for male partner engagement to attend antenatal care in Misungwi district Tanzania

Boniphace Maendeleo¹ Dismas Matovelo¹ Sylvia Tinka¹, Victoria Yohani¹, Rose Laisser¹, Hadija Swai², Mwaikasu Lusako² Tumsifu Matutu³, Hannah Mercader⁴, Jenn Brenner⁴ Jenna Mitchell⁴,

¹*Catholic University of Health and Allied Sciences*, ²*Bugando Medical Centre*, ³*Agriteam Health Tanzania*, ⁴*University of Calgary*.

Abstract

Male partner engagement and support during pregnancy leads to better maternal, newborn, and child health outcomes. However, available reports show that there is low male engagement and little is known about gendered perspectives concerning factors that hinders male engagement in rural Tanzania. Our aim was to explore factors affecting male engagement in ANC, with their pregnant partner in Misungwi district Tanzania.. We used qualitative method, respondents were recruited using purposive sampling technique. Research team and research assistants collected data from 12 focused group discussion to pregnant women, women with children, expectant father and mothers and supplemented with 10 in depth interviews in similar groups. were done among and 10 key informant interviews were done to local leaders, health care providers community health workers, traditional birth attendants. Data were collected using both native (sukuma) and national language (Swahili). Data were transcribed in Swahili and translated into English language by research assistants. We used thematic analysis of gathering information to obtain themes using Nvivo version 12. We found three main themes on barriers towards male partners' engagement in ANC which are: Cultural beliefs (women secrecy about their pregnancy, men perceive that they have been charmed by their partners, men having extramarital affairs) Health facility constraints (Lack of priority, lack of feedback about pregnancy progress from the providers and men are left outside like bicycle

watchmen) and social stigma (self-stigma, family stigma and community stigma). Male engagement efforts in accessing care which are inclusive should highly be encouraged in low and middle income countries.

Key words: *Barriers; Male engagement; Antenatal Care; Misungwi-Tanzania*

Male engagement bylaws: Unintended Consequences Impacting Care for Single Pregnant Women in Rural Tanzania

Dismas Matovelo¹, Boniphace Maendeleo¹, Wemaeli Mweteni³, Victoria Kanuti¹, Rose Laisser¹, and Jennifer L Brenner²

¹*Catholic University of Health and Allied Sciences,*

²*University of Calgary*

³*Bugando Medical Center*

Abstract

Promoting health facility attendance for antenatal care (ANC), delivery, and postnatal care (PNC) in low-resourced settings is a critical element to programs that target maternal and newborn mortality reduction. As part of an intervention to address gender and equity issues in both Misungwi and Kwimba districts in rural Tanzania, a qualitative study was conducted to better understand local influencers, barriers and enablers to these three services. To understand barriers, enablers and influencers to facility-based ANC, delivery, and PNC. Trained focus group discussion (FGD) and key informant interview (KII) facilitators used semi-structured guides to seek participant input regarding experiences and perspectives on ANC, delivery, and PNC services. Participants were purposively selected to represent communities, health providers, and decision-makers. Discussions were audio-recorded, transcribed, translated, then coded in NVivo 10 to analyze key and emerging themes. Data from 12 FGDs and 7 KIIs revealed important barriers to care-seeking, including a common belief that pregnancy is normal and ends at childbirth, that women lack permission by husbands/families to attend ANC/PNC, a fear of learning HIV status, and perceptions of poor treatment at health facilities. An unexpected and pervasive barrier found was a perceived requirement that women should attend ANC only if accompanied by a male partner. This rule is allegedly commonly enforced in most health facilities in both Misungwi and Kwimba districts and pregnant women arriving alone may be denied services or given low priority. In other cases, women must get written permission from local leaders to seek services alone. These practices, understood as ‘local government bylaw policies’, seemingly impact ‘vulnerable women’, especially single and young women. Male involvement is important in maximizing ANC services care-seeking, yet practices requiring male attendance create unnecessary barriers for vulnerable groups and reinforce gender inequality. We need to join our hands in working with policymakers at various levels, health providers, and communities to promote access to these important services for all women.

Key words: *Gender equity, care-seeking, delivery, Tanzania*

Healthy Families Program – A summary of key findings from HIV prevention studies in a safer conception program

Mwebesa Bosco Bwana, Angela Kaida, Esther Atukunda, Kato Kalyebara Paul, **Owembabazi Moran**, Deo Tukwasibwe, Alice Najjuma, Jeanne Marrazzo, David Bangsberg, Christina Psaros, Cynthia Young, Pooja Chitneni, Jessica Haberer, Craig Hendrix, Winnie Muyindike, and Lynn T. Matthews

Abstract

Prevention of vertical transmission of HIV requires a three step approach where HIV negative women of reproductive age are protected, the unborn baby is protected during pregnancy and the infant / young child is protected from acquiring HIV during breast feeding. Elimination of mother – to – child transmission (eMCT) interventions currently emphasize the last two steps in the transmission cycle. A Safer conception program minimizes the risk of HIV acquisition for uninfected women planning to conceive with sero-discordant spouses through: HIV testing and assisted partner notification, ensuring viral load suppression in the HIV positive male partner, limiting unprotected intercourse to peak fertility, use of Pre-exposure prophylaxis and sperm washing. Here, we present key findings from various studies in our safer conception program at ISS clinic of MRRH to describe the current trends in prevention of peri-conception transmission of HIV. (a) Male involvement in pregnancy planning; – Health workers rarely involve men in family planning. (b) HIV sero-status disclosure to prospective pregnancy partner; – there is limited disclosure. (c) 110 (73%) of 153 women and 168 (97%) of 175 men among 328 index safer conception clients were in HIV sero-different partnerships. (d) 1 in 4 clients planning pregnancy is not HIV viral suppressed. (e) There is a high incidence of intended partner pregnancy of 69% among men living with HIV. (f) 45% of intended partner pregnancies reported by men living with HIV are with an HIV sero-different partner. (g) Only 24 (48%) of 50 HIV positive men enrolled in our Getting to Zero safer conception project reported using a condom at their most recent sexual act. (h) Low awareness of safer conception strategies among men living with HIV before visiting our safer conception clinic. (i) Men living with HIV invite their prospective pregnancy partners to a safer conception clinic on follow up visits. (j) The need to increase family size, have HIV negative children and protect the partner from acquiring HIV during conception, motivate HIV positive men to engage in a safer conception program. (k) 24% of 94 women in our study of HIV negative women planning pregnancy with HIV positive spouses had STIs. Chlamydia trachomatis was the most common STI. (l) 20% of HIV positive men in our study of men living with HIV attending safer conception clinic had STIs. Syphilis was the most common STI. (m) PrEP initiation is 95% and adherence to PrEP is good in 71% of HIV negative women planning to conceive with HIV positive partners. The tiers of protection to intercept HIV transmission in the peri-conception are porous and this could undermine Uganda's efforts to eliminate mother to child transmission of HIV. We recommend that safer conception programs involve male partners in pregnancy planning, screen and treat STIs, and offer HIV uninfected women female controlled safer conception methods.

Key words: *HIV, STI, Pregnancy*

Cost-effectiveness of facility and community-based treatment of moderate acute malnutrition using super cereal plus (CSB++) in Kyaka II Refugee Settlement, Uganda

Nabutanda Barbrah and Batwala Vincent

The increasing refugee population in Kyaka II refugee Settlement has impacted on available resources necessitating alternative SFP delivery strategies for children with Moderate Acute Malnutrition (MAM). However, a strategy that represents the best value for money in treating MAM has not been studied. To assess the cost-effectiveness of Facility and Community-based treatment of MAM using improved super cereal plus “Corn Soya Blend” (CSB++) among refugee children aged 6-59 months in Kyaka II Settlement in southwestern Uganda. This was a cost-effectiveness analysis (CEA) study of two malnutrition treatment strategies among refugee children residing in Kyaka II Settlement using records from retrospective data (for the implementation period January-December 2016) in children aged 6-59 months with MAM treated with CSB++ at the facility (standard of care, n=171) and community levels (n=94). Data collected included cost data (from financial documents), staff time (through interviews), and effectiveness data (from the Integrated Nutrition Register). The step-down cost allocation and ingredients approaches were used in cost estimation. The primary outcome was the Incremental Cost-Effectiveness Ratios (ICER) estimated from the provider perspective. A total of 265 children records were reviewed. The unit cost per child treated was US\$ 28 in the Facility care and US\$ 41 in the Community care arm. A total of 105(61.4%) children under the Facility care and 64(68.1%) in the Community Care arm were cured. The Facility arm demonstrated a low cost and low effectiveness while the Community care arm was costly but more effective. The Facility-based strategy was less costly and less effective while the community-based strategy was more costly but very effective. The community-based strategy therefore needs to be adopted since it conferred more effectiveness compared to the facility care arm. Strategies to reduce the high implementation costs incurred in the community care strategy need to be devised by implementers and funders.

Healthcare providers and Caregivers’ perspectives on factors underlying the persistent malnutrition of Children aged 0-59 months in Buhweju district, southwestern Uganda

Catherine Abaasa¹, Godfrey Zari Rukundo¹, Savino Ayesiga¹, Susan Pearl Atukunda², Elias Kumbakumba¹, Susan Campisi^{3, 4}

¹*Department of Medical Laboratory Sciences, Mbarara University of Science and Technology*

²*Uganda Industrial Research Institute*

³*Department of Nutritional Sciences, University of Toronto,*

⁷*Hospital for Sick Children, Center for Global Child Health, Toronto; Canada,*

Abstract

Nutritional well-being is fundamental to the attainment of the full social, economic, mental and physical potential of individuals, communities and populations. The nutritional well-being of infants and young children is positively and negatively affected by economic, environmental and maternal factors that range from food intake, health, sanitation and care. Several initiatives such as Growth monitoring, vitamin A distribution, deworming programs have been undertaken to reduce the impact of nutritional deficiency and promotion of health of under five years children in Uganda. All regions of Uganda have registered unacceptably high levels of childhood malnutrition over the years, though the distribution has not been even. Western Uganda has persistently registered the highest levels of malnutrition with Buhweju district having the highest levels of malnutrition that are above the national average. This study assessed health provider and caregiver perspectives on factors responsible for persistent malnutrition among children aged 0-59 months in Engaju and Nyakishana sub counties in Buhweju district. Focus group discussions and key informant interviews with Village Health Team members and care takers of children aged 0-59 months in Engaju and Nyakishana sub-counties and Health care providers in Buhweju district were conducted respectively to explore their perceptives on the factors responsible for persistent malnutrition in Buhweju District. Inadequate childcare services, poverty and economic occupation, Alcoholism and domestic violence as well as historic and geographic challenges were identified as factors responsible for persistent malnutrition among children aged 0-59 months in Engaju and Nyakishana sub counties in Buhweju district. Several factors are responsible for persistent malnutrition of children aged 0-59 months in Buhweju. Addressing the above factors will greatly improve the nutrition status of children in Buhweju district.

Factors influencing intimate partner violence disclosure among pregnant women attending Mbarara Municipal Council Health Center IV

Katushabe Eve and **Batwala Vincent**

Abstract

Intimate Partner violence (IPV) during pregnancy is a significant public health problem worldwide and may impact on the newborn outcomes. However in southwestern Uganda, the burden of IPV and its disclosure among pregnant women have not been studied. To assess the factors influencing IPV disclosure among pregnant women attending Mbarara Municipal Council Health Centre (MMCHC)

IV. In a cross-sectional design, 283 consenting pregnant women attending Antenatal Clinic (ANC) were enrolled to collect quantitative data with the use of pre-tested semi-structured questionnaire. Women reporting IPV during quantitative data collection were purposely enrolled into four Focused Group Discussions (FGDs). Five women were enrolled in in-depth interviews as well as four Midwives as Key Informants. Of the 283 pregnant women, 199(70.3%) reported at least one form of IPV. The commonest form of IPV was psychological reported by 108(38.2%). Some 10(3.5%) experienced all the three forms of IPV including psychological, physical and sexual violence. Only 99(49.7%) out of 199 disclosed their IPV experience. Majority 66(66.7%) disclosed to their (woman's) birth family members and only 9(9.1%) to a health care provider. Presence of witness during violence was associated with disclosure OR: 5.4[95%CI: 1.93-14.96; $p=0.001$]. Majority coped by praying to God or keeping quiet as they reported "you cannot compete with a man, if I become stubborn he can slap me so I keep quiet even when he uses bad words towards me and also I continue praying to God". The IPV burden is high and widespread among pregnant women in southwestern Uganda more especially the psychological form, but half disclosed their experience. Women were more likely to disclose if the IPV incident happened in the presence of a third person. There is need for health education and counseling from the religious perspective to encourage those who pray to God and do not disclose to do so and also to increase the proportion of those sharing their IPV experience with healthcare workers.

Acute and sub-acute toxicity of *Echinops kebericho* extracts

Serawit Deyno, Mesfin Asefa Tola, Joel Bazira, Eyasu Makonnen, Paul E. Alele

Abstract

Echinops kebericho is used for treatment of infectious disease, non-communicable disease and fumigation during child birth. Major modes of delivery are either decoctions orally taken or inhalation. This study investigated the acute and sub-acute toxicity of *E.kebericho* decoctions and essential oils. The toxicity studies were conducted in rats and mice in accordance with OECD 423 and 407 guideline. Organ weight, hematology histopathology and clinical chemistry were measured for sub-acute toxicity study. The GraphPad Prism 5 statistical software was used for the analysis and results were presented as mean \pm standard deviation (SD). The $P < 0.05$ was considered as significant. Single dose oral administration of *E. kebericho* essential oil and decoctions showed no treatment-related mortality respectively up to 2000mg/kg and 5000mg/kg. Food consumption, body weight, organ weight, biochemical parameters and histopathology of liver, kidney, and spleen didn't show significant variation in treated groups compared to controls in both treatment groups. In essential oil treated mice, urea, albumin, aspartate aminotransferase, and relative weight of right kidney showed significant variations in treated groups compared to control groups. Kidney histology showed lymphocytic infiltrates in

medium dose treated groups in essential oil treated group. In decoctions treated rats; creatinine, percent lung weight, triglycerides, and monocytes were lower in treated compared to control groups. LD₅₀ of essential oil of *Echinops kebericho* could be greater than 2000mg/kg and that of decoctions greater 5000mg/kg. The essential oil was well tolerated up to dose of 400 mg/kg per body weight of mice and that of the decoctions up to 600mg/kg of rats in 28 days sub-acute toxicity study.

Key words: *Safety, Herbal medicine, clinical chemistry, hematology, histopathology*

Physico-Chemical Quality of Selected Drinking Water Sources in Mbarara Municipality, Uganda

Ben Lukubye^{1*} and Morgan Andama²

¹*Department of Biology, Mbarara University of Science and Technology, Mbarara, Uganda*

²*Muni University*

Abstract

The study assessed the physico-chemical quality of selected drinking water sources (springs, boreholes, shallow wells and rainfall) in Mbarara municipality with respect to WHO drinking water guidelines and other guidelines in light of the increased anthropogenic activities in the municipality. A total of 70 water samples were collected from purposively selected boreholes, springs, wells and rainwater in Nyamitanga, Kamukuzi and Kakoba divisions. The samples were analysed for physico-chemical parameters: Temperature, pH, DO, BOD, TDS, EC and Total Hardness using APHA. The mean temperature and pH ranged between 18.07°C - 23.45°C and 5.74 - 7.54, respectively. The mean DO ranged between 4.84 and 12.86 mg/l; whereas mean BOD ranged between 1.83 - 7.71 mg/l. The mean TDS and EC ranged between 33.40 - 569.20 mg/l and 29.30 - 1139.90 µS/cm respectively. The total hardness ranged between 70.00 and 264.00 mg/l, respectively. The recorded mean water temperatures for each of the water sources were above the WHO threshold temperature (15 °C). Boreholes in Nyamitanga and Shuhaddea Schools, spring in Kiswahili, well in Kisenyi and rainwater in MUST had mean pH below the WHO minimum guideline value (6.5) hence acidic. Borehole in Nyamitanga secondary school, spring in Kisenyi, shallow well in Nyamitanga and the rainwater in MUST had mean DO below the WHO range (10 - 12 mg/l). Borehole in Shuhaddea Secondary School and the well in Kisenyi had average BOD values above the range of EU guideline values (3 - 6 mg/l). TDS and EC of all the water sources were below the WHO maximum guideline limits of 1000 mg/l and 1500 µS/cm respectively. The physicochemical parameters of some of the selected water sources in Mbarara municipality have been

compromised mainly by the increased human activities therefore ensure proper sanitation and water safety plans for these drinking water sources to avoid further contamination.

Key words: *Drinking Water Sources, Mbarara Municipality, Physico-Chemical Parameters*

Fungal contamination and aflatoxin occurrence along production stages of Ajono (local brew) from Soroti District, Eastern Uganda

¹Sarah Nantumbwe, ¹Godfrey Begumisa and ^{2*}Rosemary Nalwanga

¹*Mbarara University of Science and Technology*

²*Makerere University*

ABSTRACT

Local brews are beverages that are diverse in composition, taste and nutritional value. The grains from which local brews are made are often contaminated with fungi which produce mycotoxins that are known to have adverse effects to human health. In addition, handling practices along the production stages of the local brew may create a conducive environment for fungal colonization. Therefore, the aim of this study was to assess fungal and aflatoxin contamination along the production stages of Ajono (local brew) from Soroti district, Eastern Uganda. In this study, a total of 180 samples were collected from the three stages of Ajono production. An interview guide was used to assess the processing practices of Ajono while fungal contamination was assessed using standard methods. TLC and c-ELISA techniques were used for screening and quantification of aflatoxins in the samples. Most brewers used plastic drums (50%) and pits (47%) as vessels for fermentation. *Aspergillus* spp. were found to be the most prevalent molds at all stages of Ajono production. Besides *Aspergillus* genera, other six mold genera were also identified. In addition, only two yeasts genera were isolated. Aflatoxin B and G were detected along the production stages of Ajono with the highest aflatoxin levels (14.16 ± 3.13 ppb) in the paste stage using plastic drum fermenters. Plastic drum fermenters produced the highest percentage (46.9%) of paste samples above UNBS aflatoxin permissible limits (10ppb). Plastic drum fermenters also produced paste with the highest proportion (81.3%) of samples above EU aflatoxin permissible limits (4ppb) compared to pit (57.1%) fermenters. Conclusively, samples from plastic drum fermentation vessels had more fungi and aflatoxins than those from pit. Therefore this study recommends use of pit as a vessel for fermentation. However, brewers should ensure hygiene along the entire production chain of Ajono so as to reduce fungal and aflatoxin contamination.

Key words: *Aflatoxins, Ajono-local brew, Fermentation, Mold, Soroti district*

Medicinal plant species used by local communities of Bwambara Sub-county, South Western Uganda

Hannington Gumisiriza, Grace Birungi, Eunice Apio Olet, Crispin Duncan Sesaazi

Abstract

The application of ethnobotanical indigenous knowledge is very important in improving primary healthcare systems among the local communities living around and within protected areas in Bwambara Sub-county, Rukungiri District. Despite the rich floral diversity and cultural heritage, there is no published documentation on the use of medicinal plants in this area. This study identified and documented the use of medicinal plants, plant parts used, and mode of preparation and administration. A cross-sectional study was used to collect data from 202 informants using semi-structured questionnaires, open interviews and field visits. Ethnobotanical data was analyzed using use reports (UR), frequency of citation (FC) and Informant Consensus Factor (F_{IC}). The plants species were identified by botanists and voucher specimens were deposited. A total of 302 medicinal plant species were mentioned by informants, out of which only 211 species belonging to 65 families and 165 genera were collected, identified and documented. The remaining 91 species were not available for collection and informants stated that they had become very rare within the study area. Most of the medicinal plants were harvested from the wild, either growing in abundance (41%) or as rare species (21%). Exceptional modes of administration such as touching with bare hands and sweeping over the affected part were reported for the first time. The medicinal plant species were reported to treat 134 physical ailments. The highest number of medicinal plants (146 plant species) was used for treatment of digestive disorders. Among the species with higher use reports, *Gouania longispicata* had the highest frequency of citation (FC =174) and was mentioned to be used to treat 41 physical ailments. The most important ailment treated by *Gouania longispicata* was allergy with 102 use reports. A variety of medicinal plants are used by communities living near protected areas in South Western Uganda. Much as allergy has not been identified as a major threat by the health sector in Uganda, the study found out that it is one of the prevalent ailments in the study area. While the therapeutic value of some of the documented medicinal plant species, especially those with higher frequency of citation have been scientifically validated, the efficacy and safety of other species with wide application need to be investigated. In this study, we recommend further scientific studies on *Gouania longispicata* to validate its wide usage in the study area.

Key words: Medicinal plants, indigenous knowledge, Ethnobotany

Adolescent vulnerability in the Health System, rural Tanzania

Wemaeli Mweteni^{1*}, Julieth Kabirigi¹, Victoria Daffi², Girles Shabani², Hellen Mahindi², Dismas Matovelo², Kathleen Helen Chaput³, Jenn Brenner³.

¹*Bugando Medical Centre*

²*Catholic University of Health and Allied Sciences*

³*University of Calgary, Canada.*

The health systems worldwide are faced with an increasing challenge of providing reproductive, maternal, newborn and child services (RMNCH) to more younger women aged between 15-19 years. Tanzania has a 17th highest adolescent fertility rate in Africa. According to Tanzania Demographics Health Survey (TDHS) there is an increasing trend in adolescent pregnancies from 23% to 27% from 2010 to 2015-16 respectively. A well-managed health system achieves more accessible, equitable and sustained improvements and health outcomes for maternal, newborn and child services among others. The health system is not well suited to handle adolescents' unique biological and socio-cultural characteristics hence make adolescent more vulnerable while accessing RMNCH services. This study aimed to explore adolescent vulnerability in the health system that become barriers to accessing MNCH services in Misungwi district, rural Tanzania. Using a socioecological framework, we conducted 22 In-depth Interviews (IDI) in 2018 with adolescent women who were pregnant or parenting a child under five years old to explore adolescents' barriers to accessing RMNCH services in Misungwi District and nine Key Informant Interviews (KIIs) with health care providers. We conducted Eight focus group Discussions (FGDs) involving young husbands, elder men and women. We used purposive sampling to recruit participants for IDIs, KIIs and FGDs. All Interviews were audiotaped, transcribed, translated and analyzed thematically. We identified 3 main themes: Difficulty entry to the health system (Adolescents delay or denied services due to the absence of partner, Failure to afford ANC and delivery service cost, Use of abusive language); limited ability to provide quality services to adolescents at the health facilities (Unfavorable environment to provide RMNCH services to adolescents, Inadequate medical equipment and supplies at Health facility); Inadequate provision of RMNCH services health education relevant to adolescents. To improve MNCH services provision to adolescent women there should be an easy entry environment to the health system to mitigate adolescent vulnerability that they already have. The health system needs to strengthen adolescent friendly policies, guidelines and protocols, adolescent friendly facilities that offer safe environment, privacy and information, and train health care providers on adolescent friendly services.

Key words: *Adolescent women, Health system, Vulnerability.*

Collaborative curriculum design and implementation for global student community engagement: experiences of faculty from MUST & UoC

Wilfred Arubaku², Tyler Warnock¹, Teddy Kyomuhangi², Jennifer L. Brenner¹, **Barbara Naggayi**²

1University of Calgary 2Mbarara University of Science and Technology

Mbarara University of Science and Technology (MUST) philosophy has been built on Community Based Education (CBE). The faculties implement curricular that immerse learners for experiential learning in rural communities. Overtime, MUST established collaborations regionally and internationally. Through these collaborations bilateral student and faculty exchanges have been implemented. During CBE, faculty and learners are exposed to health, social and economic challenges communities face and are expected to catalyse community-led solutions by a systematic Community Engagement (CE) process. Recently MUST FOM, FIS & MNCHI in collaboration with Cumming School of medicine-University of Calgary (UoC) collaborated to pilot a new Global Student Community Engagement Program (GSCEP) curriculum in rural south western Uganda. It was un-known how this collaborative curriculum design and implementation would impact the faculty involved. Study objectives were to: 1. Establish the effect of participation in the collaborative curriculum design and implementation on the knowledge, skills & attitudes of MUST and UoC faculty. 2. Determine how participation in the GSCEP influences their future participation and practice. The qualitative study design was utilized and digital surveys for faculty/facilitator participants were sent out following the completion of a three week GSCEP and were anonymous. Results show GSCEP provided a unique learning opportunity for faculty through collaborative curriculum design and implementation. Faculty additionally acquired new knowledge, skills & attitudes in CE facilitation and immersion learning. They further anticipate practicing their new knowledge and skills in CE and other areas of lectureships. We conclude that participation of faculty in GSCEP creates an opportunity for faculty to attain new knowledge, skills and attitudes that are transferable. Our recommendation is that faculty participates in opportunities related to GSCEP since this provides an avenue for new learning.

Key words: *Global, community, engagement, faculty*

Common illnesses among under 5 children managed by Community Health Workers in rural southwestern Uganda: A 5-year trend

Andrew Christopher Wesuta

Mbarara University of Science and Technology

Abstract

The control of malaria, pneumonia and diarrhea is important for the reduction in morbidity and mortality among children under five years. Uganda has adopted the Integrated Community Case Management strategy using Community Health Workers to address this challenge. The extent and trend of these 3 conditions managed by the community Health workers is not well documented. This study was done to document Community health workers contribution and the trends of the three common illnesses in Bugoye sub-county. A retrospective review of monthly morbidity data for children less than five years of age for the period March 2014 to December 2018 in Bugoye, Kasese was done. The total number reviewed was 24, 901 records. The data was analyzed using STATA version 14. In total 24,901 were reviewed and females were 50.1%, pneumonia was highest cause of illness among the infants (< 1year) while malaria was the highest among the children 1 year to 59 months. Infection with a single illness was the commonest but there were some multiple infections. All the Community Health Workers were managing the 3 common illnesses among children <5 years. The trend of the 3 common illnesses was changing from malaria to pneumonia being the commonest. Children aged 12-24 months and 25-59 months were at 2.5 times (95% CI 2.3-2.7) and 6.3 times (95% CI 5.8-6.8) respectively more likely to get malaria but less likely to get pneumonia and diarrhea. Community Health workers are involved in the management of all the three commonest illnesses. The trend of the commonest illness is changing from malaria to pneumonia. Children under one year are at a higher risk of getting pneumonia and diarrhea and at a lower risk of getting malaria.

Key words: *Common illnesses, Community Health Worker, Uganda, Under five children,.*

Mainstreaming the CHW program in district health systems in rural Mwanza region, Tanzania

Tumsifu Matutu^{2*} and Wemaeli Mweteni¹

¹*Catholic University of Health and Allied Health Sciences, Community Health Department, Mwanza, Tanzania*

²*Agriteam Health Tanzania, Misungwi, Tanzania*

Abstract

Tanzania's community health worker (CHW) program was designed to improve access to care for underserved and marginalised populations. In Tanzania, the human resource gap is estimated at 65%, much of this at the primary care level in rural areas. The Canadian-funded Mama na Mtoto project aims to mainstream CHWs in two rural districts. We have identified success factors and best practices for district integration and sustainability of CHW programming in this context. The project consistently applies a participatory approach within each stage (using the Scan, Orient, Plan, Equip, Train, Act and Reflect (SOPETAR) framework). We fully engaged regional and district leaders, health facility in-charges and community leaders at each step. District leadership and implementers were oriented on CHW programming, and engaged in planning, CHW selection, training and monitoring. District leaders were trained on supervision and leadership skills, and held monthly meetings to develop action plans and reflect on challenges with CHW program implementation. Qualitative data on district integration was collected through focus group discussions and key informant interviews, and data analyzed thematically. The project participatory and district-integrated approach resulted in increased CHW program awareness and ownership of regional and district leaders, demonstrated through initiative in monitoring and supporting CHWs, strengthened CHW supervision and leadership capacity and practice of districts and facility staff, strong links between CHWs and facilities, with enhanced community referral and reporting to the facility and increased participation of CHWs in community meetings, high CHW retention rate: 99% after one year, with no cash incentives paid and increased district capacity to train CHW for replacement of dropouts (twelve new national trainers at district level). District leaders were substantively involved in planning CHW program and implementing each step of selection, training, deployment, support and monitoring. This mainstreaming approach established ownership, enhancing CHW effectiveness and potential for sustainability.

Empowering girls and women in Rubirizi District on menstrual health/hygiene through education and reusable pads' making skills

John Owor

Globally, at least 500 million women and girls lack adequate facilities for menstrual hygiene management. Our seven-week study in Rubirizi District focused on health education about menstrual health/hygiene and provision of skills on how to make simple reusable pads using easily accessible materials. To increase knowledge about menstrual health and hygiene among women and girls in rural areas. To equip them with skills on how to make simple reusable sanitary pads from easily accessible materials. We administered questionnaires, one on one interviews, had home visits and village meetings to assess their knowledge. We sensitized boys and girls in upper primary, school leaders, community leaders and women in the community. We also taught the above groups how to make simple re-usable sanitary pads using cloths, threads, needles, scissors/razorblades and a cotton cloth. We reached out to eight schools and four communities including a total of 1342 students and 106 women respectively in Rubirizi District. After a period of five weeks, students in all the schools and women in the communities had made their own pads. We then administered the same questionnaires to two public schools and there was an increase in knowledge from 26% to 76%. Inadequate knowledge and lack of resources about menstrual health and hygiene is a challenge to the health of women and girls in rural areas. If unattended to, this may lead to increased absenteeism of girls in schools, school dropouts, early marriages, diseases among others. We recommend reaching out to more rural areas to spread this innovation.

Keywords. Education, knowledge, pads, skills

SUBTHEME: *Applied solutions in Energy, health and industry*

Science Technological innovations in learning

Development of a Rapid diagnostic test for cervical cancer in resource constrained countries

¹Habert Tumwesigye and ²Eugene Bizimana

Cancer of the cervix is the second most common cancer worldwide, with 528,000 new cases and 266,000 deaths in women every year. Cervical cancer is one of the leading cause of cancer related death in women in Uganda. WHO highlights that 3915 Uganda women during the year of 2014 were diagnosed with cervical cancer and 2160 died. This is because the current methods require more than 3 weeks to give results which delays onset treatment. We used the methodology applied in developing the lateral flow assays to develop the cervical cancer diagnostic strip using biomarkers associated with cervical cancer. Results showed that the strip is 99.8% efficient. It is highly sensitive (99.9%), selective (99.9%), and acceptable (99.9%) among the women who were attending oncology department of MRRH. Conclusively the strip is the fastest, cheapest, easiest and most acceptable method of cervical cancer screening. This is so because it gives valid and reliable results in 15 minutes and respects patients' privacy which definitely leads to early onset treatment. We recommend the following: The strip be used in all health facilities involved in cervical cancer screening because it doesn't require sophisticated technology to operate. Patients do self-testing after being given short user training. That the strip be used in massive cervical cancer screening exercise because the strip is fastest, cheapest, easiest and most acceptable method. That the Ministry of Health takes up the project to ensure massive production of the strips so as to ease accessibility.

Adaptive-Size Dictionary Learning using Information Theoretic Criteria for Image Reconstruction in Low Field Magnetic Resonance Imaging

Emmanuel Ahishakiye^{1*}, Martin Bastiaan Van Gijzen², Julius Tumwiine³, Johnes Obungoloch¹

^{1*,1} *Department of Biomedical Engineering, Mbarara University of Science and Technology, Mbarara, Uganda.*

^{1*} *Department of Computer Science, Kyambogo University, PO Box 1, Kyambogo, Kampala, Uganda.*

² *The Delft University of Technology, Delft Institute of Applied Mathematics, The Netherlands.*

³ *Department of Mathematics, Mbarara University of Science and Technology, Mbarara, Uganda.*

Abstract

Magnetic Resonance Imaging (MRI) is a safe medical imaging technology that provides a noninvasive way to view the structure of human anatomy. However, conventional (high-field) MRI scanners are very expensive to purchase, operate and maintain in developing countries. Due to these limitations, many people in developing countries do not have access to MRI technology. To address this challenge, teams from Mbarara University of Science and Technology (MUST) in Uganda, Leiden University Medical Center (LUMC) in the Netherlands, Delft University of Technology (TU Delft) in the Netherlands and Pennsylvania State University (PSU) in the USA are working on developing affordable, portable and low-field MRI scanners, aiming to diagnose children in developing countries with hydrocephalus. The low field MRI systems currently under development are characterized by the low signal-to-noise ratio, and this has a very big impact on the quality of the final image. To overcome this challenge, this study proposes an image reconstruction approach using adaptive-size dictionary learning, which could help improve the signal-to-noise ratio of the generated images, thereby improving the image quality. The proposed approach adopts the dictionary size that is most appropriate to the data during the learning process by using Information Theoretic Criteria (ITC). Experiments on the images obtained from the low-field MRI scanners show an improvement in image quality and finds the true dictionary size with very good accuracy. In conclusion, using a dictionary size that is appropriate to the input data could reduce the computational complexity, and also construction accuracy since only dictionary atoms that are relevant to the reconstruction are included in the dictionary.

Keywords: *compressed sensing, dictionary learning, image reconstruction, Information Theoretic Criteria, low field MRI*

Let All Know: Insights from a digital storytelling facilitator training in Uganda

Wasswa William¹ Tingting Yan², Michael Lang², Teddy Kyomuhangi¹, Jerome Kabakyenga¹, Eleanor Turyakira¹, Scholastic Ashaba¹, Neema Murembe¹, Manasseh Tumuhimbise¹, Elias Kumbakumba¹, Jennifer L Brenne²

¹Mbarara University of Science and Technology (wwasswa@must.ac.ug),

²University of Calgary

Abstract

Digital storytelling (DST) is a methodology that guides participants in creating short 2-5 minute movies to tell their stories, incorporating voice over, music and images. DST is used for education, research, advocacy, and therapy. Though widely used in Europe and North America, DST use in Africa is limited. In East Africa, digital stories are primarily created in partnership with

western organizations and facilitators. To close this gap in local capacity, an inaugural DST Facilitator Training workshop was offered to Ugandan participants from Mbarara University of Science and Technology (MUST) in July 2019. A study assessed effectiveness of the DST Facilitator Training and explored DST feasibility and adaptation to the Ugandan setting. Study findings will inform future DST trainings and format, promoting cultural alignment. In the DST Facilitator Training, trainees created their own stories and learned DST technique and theory (5d), created digital stories with village health team (VHT) trainers (2d), and held a community screening (1d). All trainees were invited to participate in this Participatory Action Research (PAR)-style study. Data was collected through: (1) daily journals (participant self-report to semi-structured open-ended questions), and (2) a focus group at workshop end. Qualitative analysis was conducted using a PAR approach, where participants and researchers collaboratively analyzed observations and generated themes. Written consent was obtained. Approved by University of Calgary (REB19-0622); MUST (IRB 07104-19). All 6 workshop participants (3M/3F), representing 5 faculties and research institutes, participated. 12 videos were created (6 trainees, 6 VHT trainers). PAR revealed the following themes: (1) The DST facilitator training curriculum developed for a Western setting was largely effective and culturally appropriate in Uganda; (2) DST can modernize traditional oral storytelling practices, potentially increasing engagement, reach, and impact; (3) Special logistical and ethical considerations were required when working with vulnerable, rural, and illiterate groups. Potential solutions involved staggered and careful DST introduction, collection of feedback during screenings, and additional modules to explore these topics in future training workshops. This small pilot study validated DST as a highly promising methodology in this East African setting. Exploring the potential for DST requires strong local DST capacity and community partnerships, especially when engaging vulnerable groups. Additional studies are needed to probe strategies for working with vulnerable groups, for DST to thrive in East Africa.

Keywords: Digital storytelling, Uganda, social change, health promotion, participatory action research, qualitative research

On the possible contribution of ionospheric vertical drifts to TEC modelling in low latitudes

Valence Habyarimana^{a,*}, John Bosco Habarulema^{b,c}, Patrick Mungufeni^a

^a*Department of Physics, Mbarara University of Science and Technology, Mbarara, Uganda*

^b*South African National Space Agency (SANSA) Space Science, 7200 Hermanus, South Africa*

^c*Department of Physics and Electronics, Rhodes University, 6140, Makhanda, South Africa*

Abstract

A single station empirical total electron content (TEC) model based on the Global Navigation Satellite System (GNSS) data during 2001-2015 is presented over the African low latitude region. For the first time, we have investigated the contribution of ionospheric vertical drifts to TEC modelling by including vertical **EXB** drift generated from Communication/Navigation Outage and Forecasting System (C/NOFS) satellite data as an input along with diurnal variation, seasonal variation, solar activity and geomagnetic activity representations. The inputs were used to develop the neural network (NN) TEC model over Mbarara, MBAR (0.6°S, 30.74°E; 10.22°S geomagnetic) which was later validated on independent dataset that was selected from different solar activity periods. The model without vertical **EXB** drift as an input gave mean absolute error (MAE) of 4.013 TECU. Inclusion of the vertical **EXB** drift input reduced the MAE to 3.757 TECU equivalents to an average improvement of 6.4 % in TEC modelling. The maximum improvement attained was around 13 % during the high solar activity period. The correlation coefficient (R) values for models without and with vertical **EXB** drift input were 0.954 and 0.958 respectively. Our results show that availability of ionospheric vertical drift data has the potential of improving future TEC modelling in low latitude regions.

Key words: *Neural networks, Total Electron Content, vertical EXB drift*

On the Geometrically induced Spectrum of a two-dimensional Robin Quantum Waveguide

Abdulwahabu Mbidde Sentayi^{1*} and Martin Karuhanga¹,

¹*Department of Mathematics, Mbarara University of Science and Technology*

Abstract

In this study, properties of the geometrically induced spectrum of a two-dimensional curved quantum waveguide with constant width subject to Robin boundary conditions on the opposite sides were investigated. The essential spectrum of the straight Robin quantum waveguide is well known to be the interval $[\lambda_1, \infty)$, where λ_1 is the first eigenvalue of the one-dimensional second order differential operator on the width of a straight strip. When the quantum waveguide is curved, its curvature generates discrete eigenvalues below the bottom of its essential spectrum. Variational methods together with Neumann bracketing have been used in this study to show that under certain conditions on the curvature of the quantum waveguide, the infimum of its essential spectrum coincides with that of the straight one. Furthermore, it was also shown that the existence of isolated eigenvalues entirely depends on the total bending angle and the Robin parameters. Finally, an upper bound for the distance of spectral threshold (infimum of the spectrum) from the bottom of the essential spectrum of the curved quantum waveguide is obtained and is equal to a constant which depends on the total bending angle and the Robin parameters.

Key words: *Quantum waveguides, Robin boundary conditions; Spectrum; Variational Methods*

Testing Leech's Model on Successful Doctoral Student Completion in Makerere University

Lunyolo, O; Bakkabulindi, F E K and Tusiime, H M

*East African School of Higher Education Studies and Development (EASHESD),
College of Education and External Studies (CEES), Makerere University (Mak)*

Abstract

In this study, we used Leech's (2012) model to explore the predictors of successful doctoral student completion (SDSC) in Makerere University. We operationalised SDSC as readiness to teach at university level; creativity; and readiness to do research and to write for publication. Basing on Leech's model, we postulated the predictors of SDSC to be: individual resources; the program of study; the micro environment; and the macro environment of the doctoral study. We hence had four hypotheses (H1-H4) in each of which SDSC was the predicted variable. In H1, we postulated four constructs of Individual Resources namely, Motivation, Personality, Thinking Style, and Self Efficacy as the positive predictors. In H2, we had two constructs of the Program of Study namely, its Curriculum and Standards as the positive predictors. In our H3, four constructs of the student's Micro Environment namely the Culture of the Department on Graduate Education, the Supervisor, Other Faculty, and Peers were the positive predictors. Our H4 had four constructs of the student's Macro Environment namely, the Culture of the College on Graduate Education, the Culture of the Discipline, and the engagement of the student in Collaboration/Networking as the positive predictors. In our positivist study, we administered a self-administered questionnaire to 149 doctoral students. In terms of analysis, apart from Factor Analysis and Cronbach Alpha which we used for testing the validity and reliability of our constructs, we tested our four hypotheses (H1-H4) using multiple linear regression models. We hence found that three constructs of Individual Resources (i.e., Motivation, Thinking Style & Self Efficacy) of a doctoral student were significant positive predictors of SDSC. So were both constructs (i.e., Curriculum & Standards) of the Program of Study; two constructs of the student's Micro Environment (i.e., the Supervisor & Other Faculty); and one construct of the student's Macro Environment (i.e., the Culture of the College on Graduate Education). Basing on the pertinent conclusions, we made recommendations to enhance SDSC in Makerere University.

Keywords. *Doctorate, Leech's model, Makerere University, Positivist paradigm, Predictor, Regression, Successful doctoral completion*

Bullying, Pro-social behaviors, and Attendance among Secondary School Students in Kashari County, Mbarara District

Micheal Herb Bangi and Imelda Kemeza

Abstract

The study established the relationship between Bullying, Pro-social behaviours, and Attendance among Secondary School Students in Kashari County, Mbarara District. Particularly, the study assessed the prevalence of bullying among students, examined the relationship between bullying and students' school attendance and established the relationship between pro-social behaviour and school attendance. The study adopted a descriptive cross-sectional survey design. A sample of 410 respondents participated in the study. Data was collected from primary and secondary sources. Questionnaires were used to collect data. Data were analysed using H-test and Pearson correlation. From the findings, the prevalence of traditional bullying was higher than the cyber bullying; bullying showed a positive and significant relationship with students' school attendance while pro-social behaviours showed a positive and significant relationship with school attendance. Traditional bullying was higher than cyber bullying while bullying and pro-social behaviours relate to school attendance among secondary school students. It is recommended that school administrators make a deliberate effort in establishing and strengthening counselling services in schools with a view of protecting children from bullying. They should promote violence free consciousness among students, teachers and other members of the school communities including parents. School counsellors should as a matter of priority endeavour to ensure the promotion of life skills to prevent violence against students in schools where appropriate co-curricular activities in school clubs focusing on violence prevention should be encouraged.

Key Words: *Bullying, Pro-social behaviours, Attendance, Secondary school students, Implementation, performance, Universal Primary Education, Rural districts.*

Preparation and characterization of reduced phosphomolybdate via molybdenum blue reaction

Nalumansi Irene^a, Birungi Grace^a, Moodley Brenda^b and Tebandeke Emmanuel^c

^a*Department of Chemistry, Mbarara University of Science and Technology*

^b*School of Chemistry and Physics, University of KwaZulu-Natal, Westville Campus* ^c*Department of Chemistry, Makerere University*

Abstract

Sodium thiosulphate reduced phosphomolybdate (STRP) was prepared based on the condensation of phosphate and molybdate ions in aqueous acid medium to form phosphomolybdic acid (PMA) followed by its reduction to molybdenum blue. The STRP was characterized by ultraviolet – visible spectroscopy, fourier transform infrared spectroscopy, scanning electron microscopy, raman spectroscopy and X-ray powder diffraction. Comparison of spectral data of the STRP to that of the unreduced phosphomolybdate, indicates that the Keggin structure is retained even after reduction. X- ray diffraction data also supports the amorphous phase exhibited by molybdenum blue. SEM/EDX results indicate incorporation of some Sulphur atoms into the molybdenum blue.

Keywords: *Phosphomolybdate, reduction, molybdenum blue, Keggin structure*

Analyzing Gender Symbolism of Electronic Resources among Faculty for Enhanced Uptake and Transformation of Teaching: The Case of Electronic Resources in Public Universities in Uganda

Ruth Nsibirano

Abstract

Universities world over, as institutions of higher learning are convinced that the use of Information and Communication Technologies (ICTs) can enhance not only learning but teaching experiences (UNESCO, 2012). Library electronic resources (LERs), as new ICT supported carriers of digital content, can be accessed, used or exchanged with ease to provide information. However, such gains can only be reaped if users are aware and have positive meanings. A sample of 115 (46 MUST and 69 Mak) respondents participated in the survey. In addition, 36 respondents comprising of 31 academic staff, four Librarians and one Systems Administrator were purposively selected from Mbarara University of Science and Technology and Makerere University for in-depth interviews. This study investigated the following: whether academic staff know what LERs are; that their respective university libraries subscribe to a wealth of electronic resources; LERs usefulness and how LERs are being integrated in transformed teaching practices. Results showed that staff know about electronic resources (ERs) in general; majority were not aware of LERs and, low usage of LERs was confirmed. Further, results showed that gender did not independently, directly and greatly influence awareness. Rather, seniority, exposure and experience with LERs did. Additionally, library information literacy programs were found crucial for enhancing awareness and experience. Recommend regular library awareness programs to popularize LERs, for positive library attitude building and, to enhance hands on training to boost information literacy. Further, more senior, experienced and exposed staff should share their knowledge.

Keywords: *Gender Analysis, ICT and University Teaching, Library Electronic Resources, Makerere University, Mbarara University of Science and Technology, University Academic Staff,*

On the property of factorable strongly R-summing multilinear operators on banach spaces

John Emenyu

Mbarara University of Science and Technology,

Abstract.

A natural problem in the theory of absolutely r -summing multi-linear operators is to find the best concept that lift up all the properties of absolutely r -summing linear operators. Thus, very recently Pellegrino *et al* identified the class of factorable strongly r -summing multilinear operators and proved, amongst other properties, that operators in this newly identified class are weakly compact. In this paper, we will prove that factorable strongly r -summing m -homogeneous polynomials are power compact; this property is stronger than weak compactness.

Leaching of copper, chromium and lead into drinks served using plastic cups

¹Ahimbisibwe Oliver, ¹Byamugisha Denis and ¹Ntambi Emmanuel

Department of Chemistry, Faculty of Science, Mbarara University of Science and Technology

Abstract

The purpose of this study was to determine the concentration of copper, lead and chromium in drinks served in blue and green cups of plastics companies A and B in Uganda. Twelve blue, 12 green plastic cups were purchased from company A and B and 12 cups of luminarc white (Saudi Arabia), 12 porcelain white (China) glazed cups were purchased from the shops in Mbarara Town as controls. Ash from burnt blue and green plastic cups from A and B was digested for heavy metal analysis using aqua regia. Milk and tea samples got from the same cups after holding time of 30 and 60 minutes were also digested using the same acids. Samples analysis was done in triplicates, supernatants analyzed by atomic absorption spectrometer (Agilent AAS). Blue and green cups from A were found to contain copper (8.05–38.32ppm), lead (0.73–1.86ppm), chromium (655.80–756.57ppm) and those from B

copper(5.51–22.85ppm), lead(0.76–1.43ppm), chromium(756.67–815.25ppm) . Company A cups leached copper of(ND-5.75ppm) > chromium(ND-0.60ppm) > lead(ND-0.41ppm) and those of B leached copper(ND-3.59ppm) > chromium(ND-1.08ppm) > lead(ND-0.29ppm) , all above WHO permissible limits except at low temperature of 25 °C, with milk(pH 6.2) and for short drink holding time of 30 minutes. The luminarc white and porcelain white cups did not leach detectable amounts of copper, lead, chromium hence safe for handling drinks while the blue and green cups from A and B should be used with reservation.

Key words: *Blue, chromium, copper, green, lead.*

Characterization and insect repellent activity of essential oils from leaves of *Euphorbia heterophylla*

Ivan Kahwa* and Christopher Adaku

Department of Chemistry, Mbarara University of Science and Technology

Abstract

Insects and arthropods cause diseases and discomfort in homes, offices and other dwelling places. Cockroaches are among the most loathed insects in the world because of spreading diseases and heavy infestation of most commercial premises and homes, which cause a nightmare for the inhabitants. At present, the most effective and widely used insect repellents are based on *N, N*-diethyl-3-methylbenzamide (DEET). However, prolonged exposure to insect repellents containing DEET may lead to the risk of adverse toxic effects, mainly adverse neurological effects including seizures, uncoordinated movements, litigation, aggressive behavior, low blood pressure and skin irritation [1]. As an alternative, efficacious natural products which are environmentally friendly are being considered, though such plant-derived products may generally have a weaker or short-lived repellent effect [2]. Essential oils from various plant species are one of the natural products whose repellent activities have been demonstrated [3]. The main focus of this study was to characterise essential oil from the leaves of *Euphorbia heterophylla* and to determine insect repellent activity of the oil. The essential oil (0.1816%w/w) from fresh leaves of *E. heterophylla* was extracted by hydro distillation using a Clevenger distiller and characterized by gas chromatography-mass spectrometry. The major constituents of the oil were ethyl benzene (4.92%), p-xylene (2.31%), nonane (1.59%), decane (2.04%), undecane (3.36%) and 1-isopropyl-4-methylcyclohex-3-enol (3.37%). Insect repellent activity evaluated by Olfactometer bioassay showed 100% repellency activity. The essential oil from *Euphorbia heterophylla* has demonstrated insect repellent potential.

Key words: Essential oil, Cockroaches, Insect repellent, GC-MS and *Euphorbia heterophylla*

SUTHEME: Sustainable agricultural practices

Consumer preference of jackfruit (*artocarpus heterophyllus lam*) in Uganda

¹Justine Nakintu, ²Morgan Andama, ¹Eunice A. Olet, ^{1,3} Christian Albrecht, ¹Julius Bunny Lejju

¹*Department of Biology, Mbarara University of Science and Technology*

²*Department of Biology, Muni University*

³*Animal Ecology and Systematics, Justus Liebig University*

Abstract

Jackfruit is one of the underutilized crops in the world. However, this is gradually changing in Uganda with jackfruit marketing and consumption being evident in many urban centers. Despite the increasing demand, there is lack of information on market desired attributes of jackfruit in the country. Therefore, this study was conducted to establish the attributes of jackfruit desired by consumers so as to guide farmers on the varieties to grow and traders on the varieties to stock in order to maximize the economic returns from the crop. A jackfruit party was conducted to study consumer preference for four ethno-varieties i.e. Kanaanansi, Namata, Namusaayi and Serebera. A total of 100 respondents participated in the study and evaluated jackfruit attributes using a 5 point Likert scale. The study revealed that the main attributes to be emphasized were sweet taste, big pulps, low latex, juicy as well as brightly coloured pulps (yellow and orange/red). Nevertheless, aroma, firm and crunchy texture were also important. Consumers generally preferred Namusaayi (Orange/red) and Kanaanansi (yellow) because they are brightly coloured, sweet, and have firm and crunchy texture. Namata and Serebera were the least desired because Namata is white therefore not attractive and Serebera is very soft and this gives consumers an impression of rotten fruit. Therefore, for the jackfruit business to thrive, farmers and traders need to invest in Namusaayi and Kanaanansi since they possess attributes desired on the market.

Key words: *Artocarpus heterophyllus, ethno-varieties, consumer preference, Uganda*

Local knowledge on pumpkin production, performance and utilization systems for value addition avenues from selected agro-ecological zones of Uganda

Immaculate Nakazibwe*, Eunice Apio Olet and Grace Rugunda Kagoro

Department of Biology, Mbarara University of Science and Technology

Abstract

Pumpkin is one of the underutilized fruit vegetables in Uganda despite the fact that it has wide range of both nutritional and medicinal values. Local knowledge on pumpkin production; performance and utilization systems has not been well documented in Uganda hence not readily available for people interested in commercial pumpkin farming. Therefore, a cross sectional survey was carried out to document local knowledge of pumpkin production; performance and utilization systems to prevent local knowledge erosion with time and to also aid the selection of pumpkin varieties that can be used for particular value addition avenues. The study was conducted in six districts from five agro-ecological zones of Uganda. Purposive sampling coupled with snowball methods were applied to recruit participants for the study and a total of 36 pumpkin farmers were involved. Narrative interviews, focus group discussions, and rapid participatory observation appraisals were used to gather information. Most of the participants of this study were above 46 years of age. Most farmers (27.0 %) applied manure before sowing the seeds to maintain soil fertility to obtain good yields. About 11 varieties are commonly grown and these are mainly distinguished by their skin colour, texture of epicarp and shape. It was noted that proper post-harvest handling practices must be put in place in order to improve the shelf life of a pumpkin. The most common pumpkin value addition avenue was production of pumpkin pulp flour. Knowledge on pumpkin production systems, storage and value addition varied from one region to another. The pumpkin flour can be used for enrichment of foodstuff such as wheat to enrich their micronutrient levels such as zinc, β -carotene and α - carotene.

Key words: Agro-ecological zone, local knowledge, medicinal value, nutritional value, pumpkin.

Post-harvest handling practices and their influence on physico-chemical and microbial status of beef along the meat value chain in Uganda

Juliet Kyayesimira, Lejju Julius Bunny Joseph Matofari and Grace Kagoro

Abstract

Unhygienic post-harvest handling practices influence microbiological status and physico-chemical properties of beef thus leading to losses. However, the amount of beef lost through spoilage and pathogenic contamination along the value chain has not been clear thus limiting the beef market production potential, hence the need for this study. The study determined the impact of post-harvest handling practices on beef quality and the accruing loss levels along the meat value chain in Uganda. A cross-sectional research design was employed and face-to-face interviews and participatory observation were used to collect data from six hundred and one (601) actors from Mbarara, Kampala and Mbale districts. Microbial load and physico-chemical properties of beef as well as the economic loss along the value chain were determined. Unhygienic handling practices were common at slaughter houses, transportation and butchery

which could lead to microbial contamination of beef. These included limited use of protective clothing (22.2%), sharing tools (60%), keeping knives in gum boots, limited use of standard meat grade containers (20%) and receiving money from clients at the same time handling meat (93.5%). All the microbial contamination indicators used showed highest load in the carcass at the butchery level than at slaughter houses and meat transportation for Total Viable Counts ($6.05 \pm 0.34 \log_{10} \text{cfu/cm}^2$), Total Coliform Counts ($2.40 \pm 0.23 \log_{10} \text{cfu/cm}^2$), *Escherichia coli* ($0.86 \pm 0.23 \log_{10} \text{cfu/cm}^2$) and *Staphylococcus aureus* ($4.02 \pm 0.17 \log_{10} \text{cfu/cm}^2$). This could be attributed to long time stay and continuous unhygienic touching of meat. However, *Salmonella species* were absent in all the samples. Meat indicated crude protein content of 80.45% on dry weight basis (equivalent to 20.88% on wet basis) which is categorized as high protein according to European Commission labeling regulations on nutrition. The microbial status of beef at butchery did not meet the microbiological limits criteria set by FAO/WHO which implies that Uganda's beef production does not conform to food safety regulations for international trade (export). The country faces economic losses of approximately 730,000USD annually from each beef producing district as a result of bacterial contamination. Actors should be sensitized on meat hygiene and handling and construction of better handling structures at slaughter houses and butchery. Rapid microbial testing kits should be innovated for onsite microbiological examinations to supplement visual inspection. The meat sector in Uganda should have an authority responsible to manage and regulate it just like milk has the Dairy Development Authority (DDA).

Pesticidal properties of selected plant species on pests of *Brassica* vegetables: A case study of Katanda Sub-County, Rubirizi District

Racheal Lamara and Eunice A. Olet

Mbarara University of Science and Technology

Brassica vegetables are important high yielding food crops grown in Uganda. However, their biggest production constraint is insect pest damage. Conventional pesticides have been condemned for environmental contamination; health risks; and increased production costs. As a result, there is increased interest in the application of botanical pesticides which are more environmentally friendly, cheaper and readily available. The study objectives included: documenting *Brassica* Vegetable pests in Katanda Sub-County, establishing control measures against these pests, determining the effectiveness of crude aqueous extracts of selected plant species (neem, endod, chilli pepper, onion, Mexican marigold and their birational) on the pests, and profiling the phytochemicals in the selected plants responsible for the pesticidal properties. Questionnaires were administered to farmers, fresh plant extracts evaluated in the field against important pests and phytochemistry of plant aqueous extracts analysed. The major *Brassica* pests mentioned were cabbage aphid, diamondback moth, cabbage webworm cabbage looper, cutworm, locusts, snails and black ants. The management practices included chemical pesticides, botanical sprays, mulching and uprooting infested plants. Results suggested that extracts from chilli pepper, neem, marigold and the birational of all five plants reduced *Brassica* pest infestation below economic threshold levels except for cabbage aphid and DBM. Phytochemistry results showed that plant aqueous extracts contained tannins, flavonoids, cardiac glycosides, steroids, alkaloids and saponins. The phytochemicals in the plant extracts had varying concentrations and proportions. Chilli pepper and neem extracts with higher quantities of bioactive compounds are more effective in *Brassica* pest control than onion, Mexican marigold and endod extracts which had lower bioactive components. Birationals proved to be a better alternative than the sole plant extracts offering better protection against the pests.

Key words: *Aqueous extracts, Brassica pests, Efficacy, Pesticidal plants, Phytochemicals,*

Comparative effects of selected organic and inorganic fertilizers on growth and productivity of rhizobia inoculated and non-inoculated bio fortified NAROBAN 2.

¹David Mubiru and ¹Eunice A. Olet

¹*Department of Biology, Faculty of Science, Mbarara University of Science and Technology*

Abstract

Agriculture has all along been the most contributing sector of the African economy. However, the output has for long been hampered by constantly declining soil fertility. These challenges have not excluded Uganda's agricultural sector and these have reduced the yield output, increased agricultural losses and malnourishment among low income earners. Many household farmers in Uganda do not apply either of the Organic or Inorganic fertilizers because they lack knowledge about their effectiveness in crop production. Therefore, the objective of this study was to compare the effectiveness of Inorganic fertilizer (N: P: K; 17:17:17) and the Organic fertilizer (Poultry litter), on the growth, and productivity of Rhizobia inoculated and non-inoculated biofortified NAROBAN 2 variety which is rich in Iron, Zinc, highly yielding and drought resistant. The study was a Completely Randomized Design (CRD) field experiment with three replications and was conducted from Mbarara Zonal Agricultural Research and Development Institute (MBAZARDI). The growth parameters included number of leaves, number of branches, and shoot height and the data was collected for 5 weeks starting with the second week after planting. The productivity parameters included number of pods produced per plant and economic yield whose data was collected in the 9th week after planting. Poultry litter was applied at the rate of (10t/ha), N: P: K 17:17:17 at a rate of 20.3 kg ha⁻¹ and Rhizobia at 250g per 15 kg of beans). The treatments were; Rhizobia + N: P: K 17:17:17 (M 1), Rhizobia + Poultry litter (M 2), Rhizobia only (M 3), Poultry litter only (M 4), N: P: K only (M 5) and the control (M 6). The Microsoft Excel 2013, SPSS (version 20) and Minitab 14 Demo statistical packages were used at 5% level of significance. There was no significant difference among the effects of all the treatments on the growth parameters ($P > 0.05$) while the effects of the treatments on the productivity parameters were significantly different ($p < 0.05$). Beans grown under Rhizobia + Poultry litter and sole N: P: K 17:17:17 showed the highest response on both growth and productivity compared to the other treatments. The application of Rhizobia + Poultry litter was the recommended soil remediation effort for increasing the growth and productivity of NAROBAN 2 and increase in production has a potential of increasing food security. Consequently, the price of this variety shall most likely reduce and so the biggest population being low income earners, will access and utilize this bean variety as a source of Zinc and Iron and as a result to some extent reduce the level of malnourishment in Uganda.

Keywords: *Comparative, Growth, Productivity, Rhizobia, inoculated, non-inoculated, biofortified, NAROBAN 2.*

SUBTHEME: *Natural resources, physical planning and disaster management for climate change mitigation and environmental conservation*

Gonadal Development and Intersex Condition of Marbled Lungfish, *Protopterus aethiopicus* (Heckel, 1851) in Environmentally Contaminated Sites in Lake Victoria, Uganda

Inuwa Badamasi^a, Robinson Odong^{b*}, Charles Masembe^c

^{abc} Department of Zoology, Entomology and Fisheries Sciences, College of Natural Sciences, Makerere University

Abstract

We provide the first evidence of the impact of environmental contamination on the population of *Protopterus aethiopicus* in terms of body indices, cellular development (histology) and intersex condition in Lake Victoria, Uganda. *Protopterus aethiopicus* specimens were obtained from the more polluted swampy areas receiving wastes from residential and industrial settings (Ggaba, n = 11; Port Bell, n = 10; and Jinja, n = 7), and rural, less polluted areas (Bukakata, n = 3; Kasensero, n = 4; and Bale, n = 2). Quantitative parameters, including sex ratio, gonadosomatic indices, growth condition factors and the morphometric body characteristics of *P. aethiopicus* from less polluted and more polluted sites were assessed. Fish specimens in less polluted sites had better condition and gonadal development, regardless of sex compared to specimens in more polluted sites of the lake. The population of *P. aethiopicus* in the lake was dominated by specimens of total length 45cm-55cm. Within both more polluted and less polluted sites, samples (n = 25) collected inshore ($1095.56g \pm 108.75$ SE) had significantly higher body mass irrespective of sex when compared with offshore (n = 12) specimens (645.08 ± 105.35 SE), $F_{(1, 35)} = 5.901$, $p = 0.020$. Spermatogenic cell development progressed as spermatogonia, spermatocytes, spermatids and spermatozoa among males. For oogenic cells, development was through chromatin nucleolar, perinucleolar, cortical alveolar, early vitellogenic and late vitellogenic oocytes. Mean values of gonadosomatic indices were significantly higher in less polluted sites compared to chemically contaminated urban ones ($F_{(5, 31)} = 2.783$, $p = 0.034$), suggesting better growth performance in the former. Histological examinations revealed group asynchronous gonadal development and intersex condition among *P. aethiopicus* population in Lake Victoria.

Keywords: *Intersex; Lake Victoria; Oogenesis; Protopterus aethiopicus; Spermatogenesis.*

Diversity of benthic macroinvertebrates in anthropogenically disturbed River Aturukuku, Eastern Uganda

Hannington Ochieng^{a*}, Willy P. Gandhi^{b(i)}, Godfrey Magezi^{b(ii)}, James Okot-Okumu^c, Robinson Odong^d

^a Department of Biology, Faculty of Science and Education, Busitema University

^b Fish Habitat Management Program, National Fisheries Resources Research Institute (NaFIRRI), National Agricultural Research Organisation (NARO)

^c Department of Environmental Management, College of Agricultural and Environmental Sciences, Makerere University

^d Department of Zoology, Entomology and Fisheries Sciences, College of Natural Sciences, Makerere University

Abstract

Research and protection of biodiversity have focused on large vertebrates and plants with pronounced economic values, compared to smaller organisms, such as macroinvertebrates with intrinsic roles in functioning of freshwater ecosystems. This study was conducted to investigate spatial and seasonal (dry vs wet) variability in benthic macroinvertebrate diversity and underlying physico-chemical variables, within River Aturukuku in Tororo, Eastern Uganda. A reference site in the upstream (rural) was compared with four urban mid-stream and one rural downstream, sites. Selected water physico-chemical variables and benthic macroinvertebrates at sites were bimonthly sampled and analysed using standard methods, from February to October, 2018. Benthic macroinvertebrates diversity in River Aturukuku was reduced, with Baetidae (unidentified genus), *Caenis* sp, *Simulium* sp, Chironomidae and Oligochaeta, dominating. Chironomidae, Oligochaeta and *Simulium* sp predominated at the urban sites within sewage and abattoir effluent. Shannon-Wiener diversity index (H'), species richness (S) and species evenness (E), in the river, were seasonally ≤ 2.03 , 18 and 0.84, respectively. The highest H' (2.03) and E (0.84) were at the rural downstream site, making it a potential specific spot for conservation. Prosobranch (Thiaridae) snails, bivalves (Sphaeriidae), *Potamonautes* sp (freshwater crabs) and *Pseudagrion* sp (Odonata), are under threat in the river. Macroinvertebrate abundances were not significantly different on spatial and seasonal basis ($p > 0.05$). Among the selected physico-chemical variables (pH, Temp, DO, EC, TP, TN, NO_3^- -N and TSS), only Temp and NO_3^- -N were spatially different ($p < 0.05$). All physico-chemical variables were different between dry and wet seasons ($p < 0.05$) except TP ($p > 0.05$). Factor analysis indicated that pH, EC, NO_3^- -N, TSS and TN were the likely major variables altered by anthropogenic activities, and negatively influenced macroinvertebrate diversity. Given the importance of macroinvertebrates, specific mitigation measures against the declining quality of the river, are recommended, to boost their conservation.

Keywords: community sensitization, macroinvertebrate conservation, pollutants, small ecosystems, smaller organisms

Modeling Biological Control Dynamics of the Banana Weevil, *Cosmopolites Sordidus*, (Germar), by Generalist Predators in a Banana Agroecosystem

Eliabu Horub Kweyunga

Abstract

The biological control of the banana weevil, *Cosmopolites Sordidus*, (Germar), by the generalist predator, *P. Javanus* is studied using a logistic growth model incorporating the Arditi-Ginzburg functional response term. The steady states are obtained and their asymptotic stability established. The expression for the critical weevil intrinsic growth rate is derived and its implications analyzed. Analysis reveals that instability increases with weevil intrinsic growth rate and that the model exhibits both transcritical and saddle node bifurcation. The study highlights the need to implement a complete integrated pest management (IPM) package against the banana weevil.

Gap dynamics and their influence on the chimpanzee food tree regeneration: case of *Musanga leo-errerae*, chimpanzees' fall back fruit in Kalinzu forest

^{1*}*Humphrey Kato* and ²*Grace Kagoro-Rugunda*

^{1&2}*Mbarara University of Science and Technology (MUST) Box No. 1410, Mbarara, Uganda*

Abstract

Kalinzu's tourism potential relies on the existence and sustenance of chimpanzees, which in turn relies on the sustainable existence of various chimpanzee food trees. Studies have documented that there are about 414 tree species of which about twenty one species provide food to chimpanzees in Kalinzu forest with *Musanga leo-errerae* being a significant food tree for chimpanzees because of its perennial fruiting. Like many Ugandan forests, Kalinzu forest experiences a lot of gaps due to timber harvesting and other disturbances, and it is not clear how the introduced gaps affect regeneration of chimpanzee food trees and *Musanga leo-errerae* in particular, whose fruit is a significant food for chimpanzees. This study showed the extent of regeneration of chimpanzee food trees and their distribution within the chimpanzee M-ranging group of Kalinzu forest. The study was done using 5km long parallel transects and Global Positioning System to document forest gap dynamics and regeneration of chimpanzee food trees therein. Results indicated an occurrence of 115 gaps ranging from 8.45m² to 855.10m² within the chimpanzee M-group ranging habitat. The gaps were distributed throughout the habitat. The gaps located in the south of the study area were medium in size and were mainly caused by timber harvesting and charcoal burning. Within the centre, gaps were smaller in size and gap causes were mainly tree and branch falls while

those in the northern part of the study area were as a result of gold mining and were concentrated along river valleys and were larger in size. Generally the mean gap size shows that there is less human interference in Kalinzu CFR. The regeneration in gaps were mainly dominated by *Celtis durandii*, *Craterispermum laurinum* and *Musanga leo-errerae* at seedling level and vice versa at sapling level. Regeneration of *Ficus spp* was poorest in all gaps encountered. Regeneration in gaps is much higher than in the forest understory, an indication that gaps favour regeneration of most chimpanzee food trees at Kalinzu.

Key words: *Chimpanzee, gap dynamics, Kalinzu forest, Musanga leo-errerae, regeneration*

Impacts and adaptation to climate change of local communities around Bwindi Mgahinga Conservation Area (BMCA)

¹Dennis Babaasa*, ¹Robert Bitariho and Robert Mujuni

¹*Institute of Tropical Forest Conservation, Ruhija, Bwindi Impenetrable National Park,*

Abstract

Understanding the impacts of global climate change and identifying adaptation measures to cope with these impacts require localized investigations that can help find actual and exact answers to the questions about who and what are vulnerable, to what are they vulnerable, how vulnerable are they, what are the causes of their vulnerability, and what responses can lessen their vulnerability. People living around BMCA are dependent on natural resources and are vulnerable to changes in these resources both socially and economically. In BMCA, climate change effects on ecosystems are predicted to amplify existing pressure on food security and poverty making expansion of current agricultural lands into marginal areas. This study examined the effects and adaptation needs to climate change of local communities in BMCA. We engaged local government natural resource officials of Kanungu, Kisoro and Rubanda Districts by brain storming on the causes and impacts of climate change, coping and adaptation strategies in their respective districts. The results show that: a) the adverse effects of climate conditions to which these communities are exposed are already being felt and exerting considerable stress on most of their livelihood resources; b) drought, changing seasons, erratic rain patterns, heavy rainfall, human and plant pests/diseases are the main climate-related disturbances perceived by populations; c) some of the widely used coping and adaptive strategies are inefficient; and specific adaptation needs are identified and suggestions for facilitating their long-term implementation provided.

Key words: *Adaptation, Bwindi-Mgahinga, climate change, local communities, vulnerability*

SUBTHEME: *Transformative innovation in ethics, governance, leadership and policy for sustainable development*

Transparency and engagement of Community leaders leading to successful implementation of a Community Health Worker program (CHW), rural Tanzania

Tumsifu Matutu¹ and Wemaeli Mweteni²,

¹Agriteam Health Tanzania ²Catholic University of Health and Allied Health Sciences

Abstract

Community health worker (CHW) programs are an integral component in Tanzania's health system to improve access to maternal, newborn and child health (MNCH) services for underserved rural communities, especially for women. Most CHW programs have had short-lived success, and activities may not last beyond external funding. Projects often fail to fully engage community leaders in CHW program processes such as community orientation, selecting, training and deploying CHWs. Community leaders are central figures in all local activities; ignoring existing community structures hampers the effectiveness of such programs in the community. The GAC-funded Mama na Mtoto project aims to enhance transparency and engagement of community governance structures in CHW programming to improve MNCH outcomes in rural Tanzania. The project consistently applies a participatory approach within each stage of the project cycle (using the Scan, Orient, Plan, Equip, Train, Act and Reflect (SOPETAR) framework). Engaging district leaders, facility staff, and community leaders at each step built strong relationships of accountability which enhanced full engagement and transparency of the CHW program in the community. Community leaders were encouraged to "own" their CHWs. They were oriented to their role in the CHW program, and fully engaged in planning, CHW selection, training, and reporting. Leaders were invited to open and close training sessions, and receive regular reports from CHWs. A database of Community leaders was developed to simplify communication and follow-up from the district and the projects. Meetings were held every month to reflect on challenges leaders face with CHW program implementation and develop action plans. Reviews were done through monthly, quarterly and annual meetings with embedded evaluation research. Detailed databases collect quantitative information on CHW process and outcomes to provide evidence on best practice. There was Increased CHW program ownership: Community leaders are aware and engaged in CHW activities – 87% of them hold regular meetings with CHWs. In 54% of communities, there is agreement to exempt CHWs from general community duties, in recognition of their contribution. CHWs demonstrate accountability by sending their monthly activity reports to community leaders. 68% of CHWs are members of Ward Development Committees, where they report their performance. After one year of implementation with no cash incentives, CHW retention rate was 99%. Community leaders take

initiative to solve conflicts among CHWs and address other implementation challenges within their jurisdictions. Effective community leader engagement is an important success factor for sustainable CHW programming.

Key words: MNCH, Public health, Community health workers

Antecedents of Organizational Citizenship Behavior among Academic Staff in Universities in Uganda: A Conceptual Paper

J. Kabasiita¹, F. E. K. Bakkabulindi², and D. Onen²

¹*School of Education, Mountains of the Moon University*

²*East African School of Higher Education Studies and Development, College of Education and External Studies, Makerere University*

Abstract

An employee who displays organizational citizenship behavior (OCB) is likely to have high job performance because he/she requires minimal monitoring from their supervisors. Scholars have also noted that an employee who demonstrates OCB reduces on an organization's expenditure on the account of the extra work that an employee does and yet is not paid for by an organization. It is therefore important to isolate antecedents of OCB. In this study we use Podsakoff, MacKenzie, Paine and Bachrach's (2000) model of OCB to isolate antecedents of OCB among academic staff in universities in Uganda. According the model, we postulate that OCB is a function of employee characteristics, task characteristics, organizational characteristics, and leadership behavior. In this paper, we give the background of the study, the problem; study objectives and their significance. We also review literature related to the objectives and draw hypotheses thereof. Using a positivism approach, we suggest the methodology we shall use to test the hypotheses.

Key words: Academic Staff, Antecedent, OCB, Positivism.

Sexual and Gender Based Violence Intervention Mechanisms in Refugee Communities: A Case of Nakivale Refugee Settlement, Isingiro District in Uganda

Veronica Nakijoba

Abstract

Sexual and Gender-based Violence (SGBV) remains one of the most prevalent and persistent issues facing women and girls globally (Vu, 2014; WHO, 2013). It is estimated that worldwide 35% of women experience some kind of physical or sexual violence at some point in their life-time (WHO, 2013). The problem is even more pronounced in conflict and post conflict settings where women and girls are at increased risk of SGBV. Although there have been several efforts at different levels towards mitigating SGBV in armed conflict and humanitarian settings, there remains a general lack of evidence regarding the effectiveness of these efforts and gaps in the existing SGBV prevention and response interventions (Tappis 2016). The purpose of this paper is to identify the redress measures for SGBV in Nakivale Refugee Settlement, establish the level of awareness among protracted refugees in the settlement and gaps in the SGBV preventive and response interventions. Study results indicate that various actions were done to prevent SGBV, most of which were geared towards creating community awareness on SGBV. Knowledge of existing services varied among the different nationalities in the settlement. The procedure for reporting was dynamic as survivors reported at different service points, with some starting at the police, others at the health centre, while some reported to local leaders in the camp. The absence of a streamlined reporting mechanism was a big gap in the referral pathway.

Women's intention to deliver at home: Understanding the psycho-social and cultural factors influencing birthing choices for unskilled home delivery amongst recent postpartum women in south western Uganda

Esther Natukunda

Mbarara University of Science and Technology

Abstract

An estimated 300,000 women die each year from preventable causes related to pregnancy and childbirth: 99% occur in developing countries. Uganda has one of the highest maternal (>360 for every 100,000 women) and perinatal (41 deaths per 1000 births) mortality ratios in the world. Utilization of perinatal services in Uganda remains low, with correspondingly high rates of unskilled home

deliveries, which can be life-threatening. We employed qualitative methods to explore psycho-social and cultural factors influencing deliberate birthing choices for unskilled home delivery among postpartum women in rural south western Uganda. We conducted in-depth qualitative face-to-face interviews with 30 women in rural south western Uganda between December 2018 and March 2019. The purposeful sample was intended to represent women with differing experiences of pregnancy, delivery, and antenatal care. We included 15 adult women who delivered from their homes and 15 who delivered from a health facility within the past three months. Women were recruited from 10 villages within 20 km from a referral hospital in cooperation with local village health workers. Using the constructs of the Health Utilization Model (HUM), interviews were conducted and digitally recorded in a private setting by a native speaker to elicit experiences during pregnancy and birth. Translated transcripts were generated and coded. Coded data were iteratively reviewed and sorted to derive categories using grounded theory. The analysis identified and described socio-cultural factors underpinning women's choices for unskilled home delivery. Among the 30 enrolled women, median age, parity, and duration time (weeks) since last delivery was 26 (Inter Quartile Range [IQR] 20,33] years, 3 (IQR 2,4) and 41(IQR 23,65), respectively. Eighteen women (60%) preferred the idea of delivering from home for their last pregnancy. Thirty percent of women (n=9) would definitely like to deliver from home in future, four (13.3%) would reconsider delivering from home in future, while 2 (6.7%) women with referent home deliveries reported as accidental preferred facility delivery. Women's referent birth location was largely intentional although sometimes the birth location was not planned but resulted from unplanned circumstances (i.e. situational or incidental). Women choose home delivery: (1) as a means of controlling their own birth processes, so as to conform to cultural norms and show they are loyal and strong; (2) dissatisfaction with facility-based care from personal birthing experiences or hearsays from their social networks; (3) the expectation for "natural" and normal childbirth, affecting their perceived need for facility delivery; (4) fatalism regarding birth outcomes; (5) access to alternative sources of birthing help within their communities, perceived as convenient; and (6) the existing gender and traditional norms that limit their ability and freedom to make family or health decisions and choices as women. Women's psycho-social and cultural understandings of pregnancy and child birth, their established traditions, birth goals, as well as perceptions of control, need and quality of maternity care at a particular birthing location influenced their decision to pursue home delivery in the past and the future. Interventions to address barriers to healthcare utilization through a multipronged approach to teach positive health behaviors, address specific health beliefs and support communities' positive behavior could help to debunk misconceptions, improve perceived need and motivate women to seek facility delivery.

Socio-economic factors affecting access and use of MNCH services among Vulnerable Women in Southwestern Uganda

Clemencia MurembeNeema¹, Teddy Kyomuhangi¹, Eleanor Turyakira¹, Clare Kyokushaba¹, Florence Beinempaka¹, Jennifer Hatfield², Kimberly Manalili², Jennifer LBrenner²

¹*Mbarara University of Science and Technology, Uganda;* ² *University of Calgary, Canada*

Socio-economic factors such as income, social interaction and social connectedness have a bearing on access and use of MNCH services. These socio-economic determinants strongly interact to influence health in general; an improvement in any of these can produce an improvement in both health behaviours and outcomes among individuals and communities. From 2012-2015, Healthy Child Uganda, a university-led partnership, supported implementation of a comprehensive, district-led MNCH intervention (called MamaToto) in rural South West Uganda and conducted a follow up study on the impact of MamaToto on access to health care services. To examine socio-economic factors that affect access and use of MNCH services among Vulnerable women. Through MamaToto interventions, Healthy Child Uganda supported training volunteer community health workers (CHWs), health facility providers, and district leaders to promote MNCH. Three years post intervention; we conducted a qualitative study using individual in-depth interviews with vulnerable women and focus group discussions with CHWs and community leaders in districts that received the intervention. The study used semi-structured interview guides to explore perceived barriers, enablers and influencers of access and utilization of MNCH services. Interviews were recorded, transcribed, translated and coded using Nvivo to develop themes. We interviewed 84 participants who reported that a number of factors were identified as hinderances to access and use MNCH services including; **social**: Alcoholism among men and women, self-hate, family disagreements and introduction of unfair support system. Economic factors identified were allowances provided during community trainings and awareness meetings results into divided attention as well as introduction of irregular and unsustainable support systems. Socio-economic factors have strong effect on access and use of MNCH services especially among vulnerable women and their families.

Sexual and gender based violent in protracted displacement: Social relations, survival strategies and response mechanisms in Nakivale Refugee Settlement, Uganda

Cleophas Karooma

Mbarara University of Science and Technology, Faculty of Interdisciplinary Science

As of 2017, Uganda was home to about 1.4 million refugees, the largest number in sub-Saharan Africa. Displaced persons encounter Sexual and Gender-Based Violence (SGBV) during conflict and prior to their flight, during flight, in the country of asylum. This can be due to a number of factors including the sudden breakdown of family and community structures after forced displacement. Certain groups in a population may be particularly at risk of SGBV and include women and girls. However, the International humanitarian response to SGBV in refugee settlements has grown exponentially over the past decade. Despite this growing concern, SGBV remains a hidden problem in refugee settings in Uganda. This raises a number of questions: why does the problem of SGBV persist despite the international attempts to prevent and respond to it? Using a qualitative case study approach, this question and many more will be addressed in this empirical study under different themes: the silent cries of men, collapsed masculinity, SGBV in protracted refugee situation and SGBV interventions. The methods of data collection included focus group discussions and interviews. Purposive and snowball sampling were the methods that helped us reach the respondents based on their experiences, specific characteristics and positions in the settlement. Also involved in the study are different stakeholders; including different nationalities of refugees: Rwandans, Burundians, Congolese and Somalis protracted refugees and actors responsible for SGBV in the settlement.

Key words: *Protracted refugees, SGBV*

Factors affecting Maternal health services utilizations by women of reproductive age 15-49

Christopher Turyunga

Mbarara University of Science and Technology/ Mbarara Regional Referral Hospital

Abstract

This descriptive, cross sectional study , was carried out between January, 2016 and May, 2016 in Kabale District, South western Uganda to; Establish salient factors affecting maternal health services utilization by women of the reproductive age (15-49). Specifically, both qualitative and quantitative methods were used to; Identify the extent of maternal health services utilization, social – cultural, physical –economic and health services delivery system factors and their effect on maternal health services utilization by women of reproductive age (15-49). Of the 392 participants, 390 (99.5%) were women and 2(0.5%) men and both consented for the study. Out of 390 women, 378(96.9%) participated in a self-administered questionnaire, eight 8(2%) Sub county women representatives in focus group discussion and 2(0.5%) women plus 2(0.5%) men District Officials as Key informants. They were selected using; multistage cluster, simple random and purposive sampling methods respectively. The study found out that the extent of maternal health services utilization was: Antenatal Care 87%, Skilled Deliveries 47.9% and Post Natal Services 22.8%. Multivariate modeling revealed that; respondents' marital status; health workers rudeness; presence of TBAs and self-styled doctors (Traditional herbalists, traditional water sprinklers), self-medication, private clinics and drug shops and over counter dispensing affect maternal health services utilization. Urban dwelling increased chances maternal health services utilization than being in rural setting. Participants' age, education, religion, health workers negligence , proximity to health facilities, access to information, poverty, easy and affordable means of transport, no regard for cultural practices, extortion of money by health workers, absence of drugs and sundries in health facilities , poor treatment in health facilities, lack of time by women ,fear of death in case bewitched, and lack of decision making by women in their homes were also identified as affecting maternal health services utilization. The study recommends Community health education, Refresher courses for health workers and Government workforce motivation as means to enhance maternal health services utilization.

Types of non-allopathic therapies among children under five in southwestern Uganda. A qualitative study

Peter Chris Kawungezi^{1,7*}, Jerome Kabakyenga², Onan Mulumba³, Celestine Nayebare⁴, Bashirah Mbabazi⁵, Justine Nakimbugwe⁶, Naomi Sanyu⁷, Nicholas Tumuheki⁴, Femus Agaba¹, Ivan Magomu⁷, Agnes Kyomugisha⁵, Kyamwanga Imelda Tamwesigire¹

¹*Department of Community Health, Mbarara University of Science and Technology*

²*Maternal Newborn and Child Health Institute, Mbarara University of Science and Technology*

³*College of Agricultural and Environmental Sciences, Makerere University*

⁴*Holy Innocents Children's Hospital*

⁵*Paediatric Department, Mbarara Regional Referral Hospital*

⁶*China Uganda Friendship Hospital, Naguru*

⁷*Global Health Collaborative, Mbarara University of Science and Technology*

Abstract

Non allopathic therapy refers to locally and traditionally available health care practices, approaches, knowledge and beliefs to maintain wellbeing, as well as to treat, diagnose or prevent illness. Several types of non-allopathic therapy have been reported in rural communities across the world. This study was set to describe types of non-allopathic therapy children under five years in South Western Uganda. Qualitative Descriptive cross sectional study conducted in Mbarara Regional Referral Hospital (MRRH), Holy Innocents Children's Hospital (HICH), Mary high secondary school, and two trading centres. We conducted eight FGDs, 14 key informant interviews and four case studies. Data was tape recorded, transcribed, coded, and summarized into themes. Types of non-allopathic therapy were; Herbs, Surgical practices, and spiritualism. Conditions prone to non-allopathic therapy are typical clinical conditions like pneumonia, diarrhea, Acute Central Nervous System (CNS) Infection, and malnutrition for which some are in severe life threatening forms and are part of leading preventable causes of mortality among children under five. Some practices especially the surgical practices were reported to be associated with bad outcomes even death of the under-fives. Types of non-allopathic therapies are diverse and widely accepted in the community including community drivers of change like teachers and health workers. Some conditions among the leading preventable causes of mortality among children under five years were also prone to non-allopathic therapy. This calls for combined efforts from policy makers, health care providers, opinion leaders, and local political leaders to promote and support focused community sensitization campaigns. These should especially target rural communities to explain the different practices, the life threats they pose, and the conditions that are prone.

Key words: *Non allopathic therapy", under-fives, rural communities, sick children*

Prevalence and Correlates of Gambling Disorder among Secondary School Students in Mbarara Municipality Uganda

Michael Anyanwu¹, Francis Bajunirwe¹, and Imelda K. Tamwesigire¹

¹Mbarara University of Science and Technology

Abstract

Over the recent years, gambling has evolved and grown substantially with new gambling activities and facilities being introduced, making gambling products and opportunities more available in our environment than ever. While the growth of gambling industry is considered to have a beneficial impact on the economy, it is increasingly becoming a social and public health issue especially among young people leading to gambling disorder, a gambling behavior that damages personal, family, vocational and academic pursuits. The study described common gambling activities; estimated prevalence and identified correlates of gambling disorder among secondary school students in Mbarara Municipality. A cross sectional study was conducted among secondary school students in Mbarara Municipality in 2019. A total of 921 students, from 12 schools, were recruited using cluster random sampling. Logistic regression models were fitted for factors associated with gambling disorder using STATA 12. A total of 921 participants were enrolled in the study, 362 (40%) reported to have ever gambled and 160 (17.7%) were classified as having gambling disorder. The most common gambling activity practiced by the students was sports betting. Age, gender, part time/paid work, parental involvement, peer involvement, substance use, risky sexual behavior and psychological distress were significantly associated with having a gambling disorder. This study found a high prevalence of gambling disorder among secondary school students. Therefore, there is need to institute public health measures towards raising awareness, prevention and treatment of gambling disorder.

Keywords: *adolescent gambling; adolescent gambling disorder; gambling disorder; Mbarara; student*

Prevalence and Associated Socio-Demographic Factors of Hazardous Alcohol Use among Urban Refugees in Mbarara Municipality, Uganda

Ronald Bahati^{1,2*}, Herbert Elvis Ainamani^{1,2}, Cathy Denise Sigmund^{1,3}, Godfrey Zari Rukundo¹

¹Mbarara University of Science and Technology

²Bishop Stuart University

³Geneva College Beaver Falls, PA, USA

Abstract

There are global concerns on the increasing hazardous alcohol use amongst forcibly emigrant populations. This study determined the prevalence of hazardous alcohol use among refugees in Mbarara Municipality and identified the associated socio-demographic predictors of increased risk in order to better understand the appropriate interventions needed. We conducted a descriptive cross-sectional study among 343 refugees residing in Mbarara Municipality, southwestern Uganda. The Alcohol Use Disorders Identification Test (AUDIT) was used to determine the prevalence of alcohol use in the past 12 months preceding the study. Data were entered into Epi data 3.1 and imported into Stata 15.0 for analysis. Binary logistic regressions were conducted. All the independent predictors with $p < 0.05$ entered into a multivariate analysis model to control for confounding. We found out that the majority of the participants 57.4% reported that they did not or were low alcohol users, of these 31.8% were males and 25.7% were females. Similarly 18.1% were hazardous alcohol users of these 10.8% were males and 7.3% were females. 7.6% were harmful users of alcohol of these 5% were males and 2.6% were females lastly 16.9% were dependent users of alcohol and of these 10.2% were males and 6.7% were females. The overall prevalence of hazardous alcohol use (AUDIT score >8) was 42.6% (n = 146) with a higher rate among males 25.94% than 16.61% females. The study also found that there were statistical differences in the prevalence of alcohol use across all the socio-demographic characteristics ($p < 0.05$) except for participants' length of time spent in Mbarara Municipality and gender ($p = n.s$). The study findings revealed a high level of hazardous alcohol use and also showed that there was a significant positive relationship between the socio-demographic characteristics and the likelihood of hazardous alcohol use among urban refugees in Mbarara Municipality. This study adds to the limited literature on alcohol use among urban refugees, which is a growing global concern.

Key words: Alcohol use, Municipality, Refugees, Urban

Gender relations and household income utilization among working educated couples in Mbarara Municipal Council in Mbarara Municipality, Uganda

Adebayo Tajudeen Sanni

Abstract

The question of gender relations and household income utilization among working educated couples in developing countries has long been a concern among development practitioners and policymakers. Understanding household decision-making, roles and responsibilities regarding the income utilization from a gender perspective is critical in designing sustainable policies that can help bridge gaps in gender equity for the promotion of gender equality. The study is on gender relations and household income utilization among working educated couples in Western Uganda and Mbarara Municipality in particular. The ability to negotiating during the time of pooling the income together among the educated working couples through who bring what, who decide on what and how to utilize this income need understanding between the couples. The issue of who does what, when and how has become less rigid in recent decades, stimulate by processes of emancipation, increasing developments have affected the way couples construct their relationships and gender roles for men and women have been broadened. The study sought to examine gender relations among educated working couples in Mbarara Municipal Council in Mbarara Municipality; assess the level of household income utilization among the educated working couples in Mbarara Municipal Council in Mbarara Municipality; to establish relationship between gender relations and household income utilization among educated working couples in Mbarara Municipal Council in Mbarara Municipality and to find out how working educated couples reconcile themselves with local notion in Mbarara Municipal Council in Mbarara Municipality. The study employed descriptive survey design that is cross-sectional in nature to describe and explain the relationship between the predictor variable and criterion variable. The researcher used mix methods approaches to tackle the problem of the study. The findings of this study showed that there was a significant relationship between gender relations and decision making. Preliminary findings confirm to the conventional view that social ties, level of friendship and mutual respect were proxies for gender relations and have positive significant impact on income pooling. The couples contribute to household utilization when they have made joint decisions. The findings also illustrate that roles and responsibilities causes the couple to pool income together compared to when they do not play such roles. It was finally revealed that more couples pooled their income together when gender relations are good than when it's poor. The working educated couples reconcile themselves with local notion through mutual understanding.

Keywords: *Gender relations, Household, Income, Utilization, Uganda*

Gender Based Violence Study in National Teachers' Colleges (NTCs) and Business, Technical and Vocational Education Training Institutions (BTVETs) In Uganda; Mapping non-partner gender-based violence on campus

Viola Nyakato¹, Kristien Michielsens² and Elizabeth Kemigisha¹

1. *Faculty of Interdisciplinary Studies, Mbarara University of Science and Technology*

2. *International Centre for Reproductive Health, Ghent University*

The general objective was to generate data on Gender Based Violence in the NTCs and the BTVET institutions in Uganda, in order to formulate policies, guidelines and tools aligned with the National Policy and Action Plan on Gender Based Violence, contributing to violence prevention and gender responsive learning environments, specifically in NTCs and BTVET institutions in Uganda. The design of this study is a mixed method study, with complementary quantitative and qualitative data collection. The quantitative part has the purpose to gain insights in the knowledge, attitudes, practices and experiences, reporting practices and consequences related to GBV of college students and staff. It is a cross-sectional study among 1459 respondents. The study was approved by the Uganda National Council for Science and Technology and the Ethical Committee of the Ghent University Hospital. In total, in April 2019, 1459 interviews were administered in 12 institutions. In 7 BTVET institutions 456 students (179 women and 277 men) and 126 staff (52 women and 74 men) completed the survey. In 5 NTC institutions 720 students (347 women and 373 men) and 152 staff (69 women and 83 men) completed the survey. Further, five in-depth interviews with policy makers and four focus-group discussions with institution staff were done. In general, the institutions are considered rather safe, though more for male students than for female students. 60% of students and 70% of staff say there are no places where they do not feel safe. Also, female students tend to agree less with this than male students. Substantial numbers of student respondents feel uncomfortable to go to the washrooms or to the dormitories (more women). Nevertheless, between 50 and 73.6% of respondents reported being victim of non-partner violence on campus in the 12 months before the study. In BTVET institutions, more students than staff (66.4% vs 50%) and more women than men (71.9% vs 57%) had experienced any form of violence by a non-partner on campus in the 12 months before the survey. Also in NTC institutions more students than staff (73.6% vs 55.3%) and more women than men (73.3% vs 67.8%) had experienced any form of violence. There is a substantial group of students that has suffered from multiple forms of violence. About half of the students in NTCs and one out of three in BTVETs say they have been victim of two or more forms of violence in the past year. Women report higher levels of suffering after violence than men, both for staff and students. Among female students, sexual violence received the highest median score on the “current suffering scale”

(5/10), followed by psychological violence and sexual harassment (both 4/10) and physical violence (3-4/10). The perpetrator of the most serious event differs between types of violence and depending on the sex of the victim. In conclusion we can say that the available data indicates that GBV is a real problem in NTCs and BTVETs. It is of particular importance to address GBV in teacher training institutions. Since it has the potential to live through generations. We would like to stress that this study did not assess effectiveness of these strategies in the Ugandan context and that they we cannot make evidence-based recommendations for interventions. Further, research suggests that the effectiveness of college- or university-based sexual violence prevention programs varies depending on the type of audience, facilitator, format, and program content.

Barriers for Illiterate women in accessing maternal health care in rural Northern Tanzania

Victoria Yohani¹, Pendo Ndaki¹, Rose Laisser¹, **Dismas Matovelo**^{1,2*}, Respicious Bakalemwa^{1,2}, Edgar Ndaboine^{1,2}, Magdalena Mwaikambo⁴, Jenn Brenner³, Warren Wilson³

¹*Catholic University of Health and Allied Sciences*

²*Bugando Medical Center*

³*University of Calgary*

⁴*Agriteam Health Tanzania*

Abstract

Maternal and neonatal mortality is the public health concern. Globally it is 303,000 die every year during and following child birth. Sub-Saharan Africa has the highest rate of maternal, neonatal and child deaths. One of the key elements in reduction of high maternal mortality rate is early and at least four antenatal visits. Illiterate women have less access to maternal health services. The aim of this study was to explore barriers to illiterate women in accessing Antenatal, health facility delivery and post natal services. Qualitative approach used to explore perspectives on peri-natal care-seeking from a purposefully selected sample in four Misungwi communities in rural Tanzania. We conducted 13 in-depth interviews, eight focus group discussions and 11 key informant interviews in local dialect, then transcribed to Swahili and translated into English. NVIVO 12 assisted in thematic analysis. Four themes emerged in this study as barriers for illiterate women in accessing health care: Language barrier between women and health workers (lack of self-expression, indecent language, and miss-trust), no reading skills (can't understand the messages in the posters, miss clinic appointment and expected date of delivery) as well as dependency and fear to access services at higher level facility. Illiterate women face numerous challenges in accessing care. To minimize this gap, health education at the facility should be provided in the local dialects for easy understanding and have health providers with better understanding of local contexts by use of Community Health Workers.

Key words: *Illiterate women, Antenatal, Post Natal Care, Barriers*

VHT Livelihood Skills in Bugoye sub-county south western Uganda.

Norbert Mumbere

Bugoye Community Health Collaboration

Abstract

Nationally there is no clear data about the VHT livelihood. However, from Bugoye Sub-county in South western Uganda where the program is implemented, statistics indicate that there has been a drop out of about 51 (29%) VHTS of which 11.7 % shifted to other villages 45(88.2%) dropped out due to lack of motivation. To improve on the VHTs income by empowering them with vocational skills hence improve their livelihood. A Needs assessment was carried out on the types of skills the VHTs needed, the VHTs were grouped according to their needs. Invitation of the trainers from Power of Skills Uganda (POSU) and practical involvement sessions were carried out then registers were used to track attendance of the participants. Modules / skills included Shampoo and Liquid soap making, Doughnut and Barga making, Book making and Shoe Making. Of the 81 BCHC VHTs, 67 (83%) of the VHTs turned up for the livelihood skills, 26 (38.8%) of the VHTs came from the furthest intervention villages, 51 VHTs (62%) completed all the six modules related to capacity building in livelihood skills. And about forty-four percent (44%) of the VHTs who participated in shoe making had capacity to make their own shoes and got income out of them at the end of the training. Most VHTs (67) were able to acquire skills in shampoo, liquid soap, Barga, Doughnut, book and shoe making this help them to generate an income for their day today living despite their low level of education Background. The government should include livelihood programs into the VHT program as a way of motivating them to perform their ICCM work.

A cross-sectional study using case-based skills assessment to measure quality of Integrated Community Case Management care delivered by village health workers in Bugoye, Uganda

Rapheal Mbusa

Abstract

Village health workers (VHW) in 8 villages in Bugoye subcounty, a rural area in western Uganda, provide Integrated Community Case Management (iCCM) care to children under 5 years of age. In iCCM care, VHWs assess and treat malaria, pneumonia, and diarrhea using a clinical algorithm. Study objectives included: 1) quantify VHWs' clinical performance and adherence to the clinical

algorithm; 2) assess impact of formal education on skills assessment exercise performance; 3) compare VHWs' performance as measured by the skills assessment exercise compared with prior data assessing performance via clinical record review. All 36 VHWs providing iCCM care at the time of the study agreed to complete the skills assessment exercise. This exercise included video cases depicting a caregiver of a sick child being interviewed, brief videos and case vignettes portraying children with or without "danger signs" (signs of severe illness), and reading mock RDTs. Video cases were scored based on completion of all steps in the clinical algorithm and on completion of all "critical steps" (steps required to achieve correct clinical management). Results were analyzed in Stata, with t-tests used to assess the impact of formal education. Of the VHWs, 53% were women; 31% had completed primary school only, 42% some secondary school, and 28% all 4 years of secondary school. For video cases portraying uncomplicated diarrhea and pneumonia, rates of completion of all correct steps were low (19% and 6%, respectively), driven mainly by failure to address all recommended health education topics; rates of completion of critical steps were high (92% and 97%, respectively). In a case portraying fever with a negative RDT, 100% of VHWs completed all correct steps. In a case portraying pneumonia with danger signs, 56% of VHWs completed all correct steps, while 89% completed all critical steps. Inappropriate use of antibiotics or antimalarials was low in all cases (0-3%). VHWs correctly classified 82% of brief case vignettes for children with or without danger signs. VHWs read 97% of mock RDTs correctly. There was no evidence of a difference in performance (measured as total correct management steps in the video cases, as well as a weighted overall performance metric) between VHWs with primary school only and those with some or all of secondary school ($p=0.76$ and $p=0.89$, respectively). Rates of completion of critical steps in the video cases were similar to prior performance based on clinical record review for uncomplicated diarrhea (92% vs. 97%) and uncomplicated pneumonia (97% vs 95%), but showed quite different performance for fever with negative RDT (100% vs 44%). VHWs often omitted recommended health education topics, but otherwise demonstrated high quality of care in the video cases, recognition of danger signs, and reading RDTs. Level of formal education did not appear to influence performance. The difference in performance between data sources for fever with negative RDT may have resulted from training on this topic prompted by the prior results, the Hawthorne effect, or confusion with the clinical record-keeping process in a population with limited literacy.

Influence of the promotional strategies on the consumer attitudes of TM users in Central Uganda

Sarah Nabacwa

Mbarara University of Science and Technology

Abstract

In times of modernity and with advancements in modern medicine, usage for traditional medicine (TM) was expected to have reduced. Instead, TM usage has increased and literature points to a number of predictors; among which is the promotions from the Traditional Health Practitioners (THPs). However, little is known of how the art of communication used by THPs in these promotions, is interpreted by the TM users, which in effect could influence their attitudes hence usage of TM. The objective of the study was to examine the influence of the promotional strategies on the consumer attitudes of TM users in Central Uganda. A sample of 369 respondents was drawn using purposive and snowballing sampling techniques and data was analysed using both SPSS/20 and AMOS/23. Results show that promotions highly correlate with consumer attitude ($r=.820$, $p\leq.01$) and that for every one unit change in promotions, there will be a 27.392 change in consumer attitude. The findings should enable THPs adjust their promotional strategies to be able to take advantage of the most perceived credible promotional strategies, which are highlighted in the study, in order to tap the increasing TM demand. The study was cross-sectional, so a longitudinal approach should be explored to examine the promotional influence on attitudes across time.

***Keywords** – Consumer Attitudes, Promotions, Traditional Medicine, Traditional Health Practitioners.*

Financial accountability mechanisms in local governments in Uganda: a case of Kabale district local government

¹Dr. Marus Eton, ¹Dr. Moses Agaba, ¹Dr. Abanis Turyehabwa, ²Dr. Bernard Patrick Ogwel, ³Fabian Mwosi

Abstract

The paper presents financial accountability mechanisms in local governments, with reference to Kabale district local government. A cross-sectional research design, which used both quantitative and qualitative approaches to collect and analyze data, was adopted.

Both simple random and purposive sampling techniques were used to select 117 respondents from 174 subjects. Questionnaires and personal interviews were used to collect data from respondents. Frequencies and percentages were used to analyze quantitative data while direct quotes from interviews conducted among key informants formed the basis for qualitative analysis. Quantitative analysis was aided by software for document analysis (SPSS V 20.0). In descending order of perception, service delivery was found to be the most commonly used financial accountability mechanism, followed by financial reporting, expenditure control and budget. The paper therefore, concluded that service delivery is the most used mechanism of financial accountability, though the district's local budget seemed unclear on reflecting the priorities of the local people. This paper recommended that the local government should ensure that the district's budget demonstrates community preference; salaries and wages should be paid in accordance with the district's approved budget; expenditures on development should always be as per the approved budget, and the mode of financial reporting, particularly on liabilities should be standardized. Due to the scope of this paper, which could not quantitatively relate financial accountability and service delivery, there is need for a comprehensive study on the effect of financial accountability and service delivery in Kabale district local government

Keywords: *Financial Accountability, Expenditure Control, Financial Reporting, Service Delivery, Budget*

Financial reforms implementation and accountability for Public funds in Uganda's local governments: evidence from selected districts in south-western Uganda

Muhereza John Innocent

Abstract

The study aimed at establishing the relationship between financial reforms implementation and accountability for public funds in Uganda basing on facts from three selected districts from south-western Uganda. It was guided by three (3) objectives namely; to establish the relationship between budgetary reforms and accountability of public funds in Uganda, to determine the relationship between budgetary reforms and expenditure reforms of public funds in Uganda and to assess the relationship between expenditure reforms and accountability of public funds in Uganda. The study was prompted by the cases relating to accountability, cash management, transparency and lack of openness in local governments of Uganda. The study adopted cross sectional and correlational research designs using simple random sampling and purposive sampling methods to get 52 local governments that provided 199 respondents (181-technical staff and 18- councilors) from Mbarara, Isingiro and Ntungamo. The collected data from the respondents were analyzed using SPSS and results presented in form of tables based on the study objectives. The results show that budgetary reforms had a significant positive relationship ($p=?$) with accountability of public funds in Uganda. In addition, budgetary reforms positively influenced ($p=?$) expenditure reforms of public funds in Uganda. Lastly, that there was also a significant positive

relationship (p=?) between expenditure reforms and accountability of public funds in Uganda. It was however noted that the reforms could influence accountability better if internal controls were strengthened in local governments. With these findings the study provides empirical evidence that has been widely absent, and informs discussions surrounding issues of financial reforms implementation and accountability for public funds in Uganda. The recommendations are as follows: 1) local governments should strengthen the internal control mechanisms, 2) timely start of the budget cycle, 3) capacity building on budgeting 4) involvement of especially communities that are beneficiaries of the services offered, and 5) strengthening of monitoring and evaluation.

Key Words; *Financial reforms, accountability, local governments*

Financial inclusion and economic growth in Uganda: A case of selected districts in western Uganda

Marus Eton¹, Gilbert Uwonda², Fabian Mwosi³, Godfrey Barigye⁴, Patrick Bernard Ogwel⁵

Abstract

The study was conducted to examine the role of financial inclusion in economic growth basing on selected districts from western Uganda. The researchers adopted a cross-sectional survey design and the both quantitative and qualitative approaches were used in data collection and analysis. The study used simple random and purposive sampling techniques to select a total of 194 respondents. The findings revealed that financial inclusion is significant in supporting economic growth; it upholds equitable distribution of growth benefits, transforms peoples' way of living, enhances capital creation and empowers people to go for financial services that are germane to their needs. The study indicated that Uganda's population living below poverty line is falling, which sounds precise in the context of national income but very unseemly in the context of household income. While there are indicators of reduced constraints to access to working capital, reduced constraints to accessing financial services, effective use of economic resources to produce goods and services, those in business do not see the efficacy by government agendas geared to supporting international trade or investment. The study therefore recommends that there is need for government to review and redesign her policies on international trade business and support for homegrown investments. There is need for quantitative metrics to ascertain the extent to which household income is proportional to national income. Several papers have recommended government interventions in financial accessibility.

Key words: *Financial Inclusion, Financial Services, Economic Growth, Gross Domestic Product*

Loan delinquency management strategies and financial performance of Savings and Credit Cooperative Societies in Mbarara Municipality

Baluku Watsema^{1*}, Arthur Nuwagaba^{1,2}, Anthony Agume^{1,2}

¹Bishop Stuart University

²Mbarara University of Science and Technology

Abstract

This study was set out to examine loan delinquency management strategies on financial performance of SACCOs in Mbarara Municipality. The study was guided by four objectives, which included; to examine the relationship between loan assessment and financial performance, to establish the relationship between borrowers' supervision and financial performance of SACCOs, to examine the relationship between loan collection procedures and financial performance of SACCOs. The study adopted a (non-experimental) cross-sectional survey research design. The study was both descriptive and analytical in nature with both quantitative and qualitative approaches of data collection and analysis. The study gathered both quantitative and qualitative data from 101 participants of which quantitative data was obtained from 92 participants among which included the credit managers, credit officers and accountants using questionnaires and 9 SACCO managers were subjected to interviews where qualitative data was obtained. Quantitative data gathered using questionnaires was coded and entered into SPSS (version 20) for analysis. The analysis was done and findings presented using descriptive statistics in form of frequencies, percentages, mean and standard deviations. Pearson correlation coefficient was utilized to ascertain the statistical significance between the independent and dependent variables. Findings from the study revealed that there is a strong positive relationship between loan assessment and financial performance of SACCOs ($r=0.870^{**}$, $p<0.000$). Also, findings found out there is a strong positive relationship between borrowers supervision and financial performance of SACCOs ($r=0.396^{**}$, $p<0.000$). Results further found out that there is a weak but positive relationship between loan collection procedures and financial performance of SACCOs ($r=0.259$, $p<0.01$). Qualitatively in regard to the relationship between loan delinquency management strategies and financial performance of SACCOs, the study findings found out that much as it is often perceived that loan delinquency begins when the borrower fails to pay the installment, findings indicate that the process leading to this are primarily connected to the way in which loan delinquency management strategies are being implemented by SACCOs in Mbarara municipality and this was evident in situations where the quantitative findings conquered with qualitative findings. However, the study concluded that loan delinquency management strategies influences financial performance of SACCOs. The study recommends that SACCOs need to adopt well-thought and efficient loan delinquency management strategies as means to achieve good financial performance.

Key words: *Loan delinquency, Management strategies, financial performance*

POSTER SESSION ABSTRACTS

Effect of feed supplementation on milk quality in Uganda's south-western cattle corridor: a case study of Biyinzika dairy meal.

John Mary Atusasiibwe, Eunice A. Olet and Ronald Twongyirwe

Abstract

Feed supplementation is still unpopular in this region and the little local supplements available have a wide range of preparation procedure that makes them laborious. Biyinzika Company formulated a dairy meal alleged to increase milk production in terms of volume yet its effect on quality of milk is still unknown. To investigate the effect of supplementing dairy cows using formulated feed concentrates on the quality of milk and the general body condition of dairy cows in Uganda's SWCC using a case study of Biyinzika dairy meal (BDM). A total of 203 farms were used to characterize farms in districts of Isingiro, Kiruhura, Mbarara and Ntungamo. Due to trial feed insufficiency to enable all the 203 farms take part, only 10 of these used for feed experimentation. 60 dairy cows were used in this study, choosing six cows from each of the ten farms. Basing on their bio data, they were grouped into three treatments employing a randomised complete block design and given varying treatments of the feed, for 30 days. Physical-chemical and microbial milk quality parameters of milk samples from cows were determined, as well as the body condition scores. Kiruhura district had both the largest land allocated to dairy farming, the highest percentages of the farms being of huge sizes and cattle herds while Mbarara had the least. Further still, Kiruhura district had both the highest volume of milk yielded while Mbarara had the lowest. Holstein Friesians, Jersey, Guernsey, Ankole and F1- F3 cross breeds (mainly between Holstein Friesians and Ankole) were identified. Grazing systems identified were; Fenced perimeter grazing system, Paddock and Semi-zero grazing. There was no significant difference in the BCS among the different cow groups before feeding on the feed supplement ($p > 0.05$, $n = 54$) and a significant difference in the BCS ($p < 0.05$, $n = 54$) both during and after the time of feeding on the feed supplement. The cows in the group that was not feed on the feed supplement did not show a significant difference in the BCS ($p > 0.05$, $n = 18$). Fats, Solid non fats - SNF, Density and Proteins showed a positive significant difference ($p < 0.05$) in the periods before, during and after feeding the animals on BDM but others did not. Microbes identified in the milk samples included *Klebsiella* spp, *Escherichia coli*, *Staphylococcus aureus*, *Salmonella* spp, *Enterobacter* spp, *Serratia* spp, *Pseudomonas* spp and *Micrococc* spp. There was no significant difference in microbial composition of milk from cows fed on the dairy meal and those not fed on it ($p > 0.05$; $n = 60$). Also, the differences in the microbial composition

of milk for cows in the same group; before, during and after feeding were not significant ($p > 0.05$, $n = 60$). Supplementing dairy cows in this region with such feeds as BDM could potentially improve Fats, Solid non fats - SNF, Density and Proteins in milk and the general body conditions of the dairy cows. Supplementary feeding on formulated dairy feeds and construction of milking facilities need to be encouraged.

Key words: *Body conditions, quality-based pricing, microbial quality, farm characteristics.*

Evaluating an undergraduate community engagement-focused global health field school in rural Uganda: assessing student and community outcomes

Tyler Warnock¹, Wilfred Arubaku², Teddy Kyomuhangi², Jennifer L. Brenner¹, **Barbara Naggayi²**

1University of Calgary

2Mbarara University of Science and Technology

Abstract

The study was proposed to evaluate the process and outcomes of the inaugural community engagement program being piloted with students from the University of Calgary and MUST. The students taking part in the program participated in a course and orientations in both Calgary and Mbarara. Yet it was not clear what the impact of the program would be on students and the communities involved. The objectives were to: 1. Determine the outcome and impact of the Global Student Community Engagement Program (GSCEP) was for students and community members' involved. 2. Develop recommendations for quality improvement for the Global Student Community Engagement program. The study utilized qualitative approaches [In-depth interviews (IDI), focus group discussions (FGD) and digital survey] to determine the overall experiences of those involved in the GSCEP. The results show that Student placement in communities provides opportunities for skill building and impacts health facilities "*they (the students) taught us that in day-to-day life we need to learn from each other*" – Health facility staff, IDI, Rubaya. We conclude that through GSCEP, students and community members were exposed to key learning opportunities for cross-cultural development. And we recommend the curriculum requires modifications to prevent Canadian and Ugandan teams from overlapping content and ensuring that students are adequately supported through timely feedback.

Key words: *Global, community, engagement*

Digital Storytelling Screening Workshop: Enabling the voiceless to share their own MNCH Experiences Globally

Barbara Naggayi¹, Teddy Kyomuhangi¹, Neema Murembe¹, Robens Mutatiina¹, Wasswa William¹, Manasseh Tumuhimbise¹, Tingting Yan², Michael Lang², Jerome Kabakyenga¹, Scholastic Ashaba¹, , Jennifer L Brenne²

¹Mbarara University of Science and Technology,

²University of Calgary

Abstract

Background: Digital storytelling (DST) explores a narrative account of a lived experience that is shared in form of a video which blends the use of voiceovers, images, music and visual effects.

The DST complements the traditional oral storytelling by visually engaging and bring out captivating moments, ideas or events that serve to either influence, inspire or instruct the targeted audience. Digital storytelling has the potential to effectively support research, dissemination, training and advocacy in the context of global health. In contrast with other methods of obtaining and sharing information, digital storytelling is espoused for its empowering effect on the narrator who through the process is able to decide how to craft and share their own story. Although much work has been done with adults and in high income countries, DST has been less frequently applied in low resource settings where the challenges of its production are unique and require adaptation from North American models. Considering this contextual reality, the DST screening workshop has been designed to illustrate the process of DST and how it has been adapted to suit the local settings in both Uganda and Tanzania.

Methods: The DST video screening workshop methodology will be used for showcasing specific initiatives from Healthy Child Uganda's advocacy and training platform as well as a pilot project from Mwanza, Tanzania aimed at using DST to share messages from gender and equity research with stakeholders and policymakers. The screening of the selected videos have been organized under two thematic areas namely: a) Adolescent Maternal New Born and Child health voices; b) The role of community health workers in engaging stakeholders to solve community challenges. Following an initial introduction to DST background, six videos of 2-5 minutes running time will be shown to the audience. In a bid to enhance reflection, screening of the videos will then be proceeded by a plenary discussion guided by predetermined debrief questions. Presenters at the screening workshop will include MUST staff who have been trained to craft their own stories as well as mentored to assist other trainees to develop digital stories. The process of screening and debriefing will run for two hours.

Expected Outcomes: The screening of the selected digital stories will not only facilitate learning but also provide opportunity to engage with relevant stakeholders on matters impacting maternal newborn and child health. It is envisaged that the personal reflections on the stories will inspire uptake of ideas in decision making regarding policy and programming of implementation related to maternal newborn and child health as well as consider opportunities to advance DST as a research methodology.

Key words: *Digital storytelling, voiceless, personal experience, maternal newborn child health*

Other DRGT Board Members

