



CLOSE-OUT

of THRIVE-2 (2016-2022)



SEPT. 2022

VERSION 2



Acknowledgement

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TRAINING HEALTH RESEARCHERS INTO VOCATIONAL EXCELLENCE IN EAST AFRICA (THRIVE)

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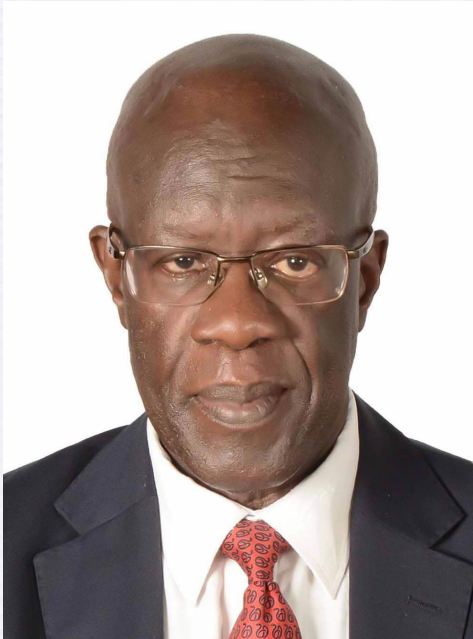
 @THRIVEDELTAS

SEPTEMBER 2022

THRIVE-2 FUNDERS



Foreword



Dear Reader,

We at THRiVE secretariat greatly appreciate you taking time to read this magazine which commemorates the close-out of DELTAS-1 funding support to our consortium. The magazine captures some of the actors and most memorable moments in our journey to build research capacity in the region.

We greatly appreciate all the support and guidance rendered to THRiVE over the years. Your contributions have made THRiVE to produce high quality scientific products. This progress has been possible because of the very promising trainees that THRiVE faculty have mentored so well. Thank you to all the faculty.

I invite you to familiarize with our different activities and outputs carried out in the last six years. You can access this information through the scientific publications in peer-reviewed journals; THRiVE website (www.thrive.or.ug); our social media channels (Twitter - @THRiVEDELTA and YouTube - https://www.youtube.com/channel/UCVip8DrTMsYwk_2FDKluy7w); public media and scientific meetings.

Our next phase is to build THRiVE Consortium as a sustainable consortium of excellence through different partnerships.

I hope you will enjoy reading this special edition magazine which looks back at THRiVE-2 DELTAS-1 achievements; highlights of research undertaken by the different fellows and community and public engagement projects that facilitated research uptake and use among non-scientific audiences.

Prof. Emeritus Nelson Sewankambo
Director - THRiVE

About THRiVE

Training Health Researchers into Vocational Excellence in East Africa (THRiVE-2) was a 5-year collaborative research capacity building project involving five universities namely: Makerere University, Gulu University, Kilimanjaro Christian Medical University College (KCMUCo), University of Cambridge and the London School of Hygiene and Tropical Medicine. THRiVE-2 also involved three research institutes namely: Uganda Virus Research Institute (UVRI), International Centre for Insect Physiology and Ecology (icipe) in Kenya and the National Institute of Medical Research (NIMR) in Mwanza-Tanzania. THRiVE's goal was to develop a critical mass of world class researchers and research leaders capable of conducting high quality independent research and transforming communities where they live and work.

Specifically, THRiVE-2 DELTAS-1 aimed to:

- 1 Implement high-quality scientific research training aimed at producing research leaders
- 2 Conduct high-impact scientific research that addresses African health research priorities
- 3 Implement public engagement programs that promote understanding of the value and use of science among the lay public, policy makers, civil society and secondary school students
- 4 Cultivate professional environments to manage and support scientific research

Our approach was to build a pipeline of researchers, supporting a cross-section of scientists at different stages of their research careers, including Graduate Interns, Masters, Ph.D., Post-Doctoral and Career Development fellows. We groomed, mentored and supported the most promising young scientists towards becoming research leaders. We focus on achieving research excellence in the areas of (a) infectious diseases/neglected tropical diseases; (b) maternal, neonatal and reproductive health, and (c) non-communicable diseases. THRiVE-2 enrolled 16 and 9 fellows for four-year Ph.D. and two-year post-Doctoral research training respectively, 33 Masters; 26 Graduate Interns and 21 Career Development Award fellows across the three East African countries.

Public Engagement Programs

To ensure that our research had the highest chances of achieving societal impact, THRiVE-2 implemented collaborative public engagement programs in Kenya, Tanzania and Uganda as part of our theory of change for building research leaders and conducting research that is relevant and transformative to society. Our aspiration was that THRiVE funded researchers and scientists develop the skills and attitudes needed to interact with the public in innovate ways that foster a better community understanding of science and research and encourage informed participation in science discourse. We aimed to improve health outcomes by enhancing public understanding and use of science, informed participation in scientific discourse and research processes by members of the non-academic public on one hand; and on the other, to enrich the research process by obtaining meaningful input from intended beneficiaries of the research. These efforts were also aimed at developing relationships with communities and organizations in communities where THRiVE researchers operate.

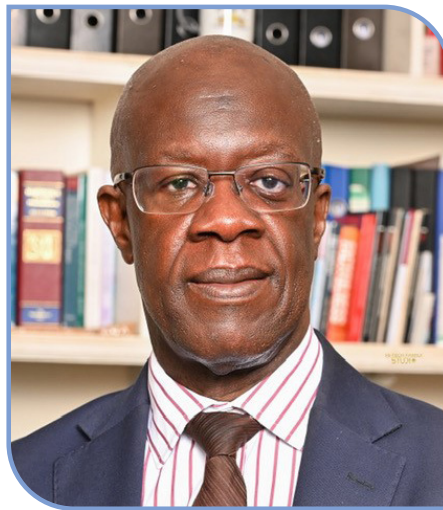


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THRiVE-2 SECRETARIAT



**Prof. Emeritus Nelson
Sewankambo**

Director, THRiVE



Dr. Achilles Katamba
M&E Officer



Harriet Nambooze
Program Coordinator



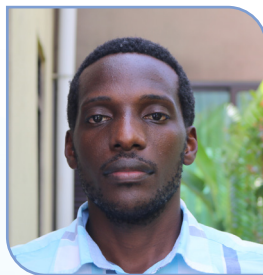
David Kitunzi
Finance Officer



Immaculate Nakityo
RECPE Coordinator



Shem Wakhanda
Grants & Contracts
Manager



Dickson Muyomba
IT Officer



Dennis Kyewalabye
RECPE Assistant



Racheal Ninsiima
Communications
Officer

THRiVE-2 Post-Doc Fellows



Dr. Stella Kepha



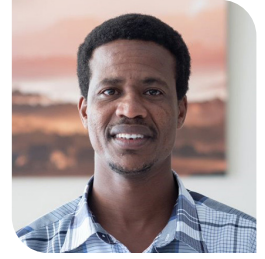
Dr. Edward Wampande



Assoc. Prof. Ireen Kiwelu



Dr. Emmy Okello



Dr. Joel L. Bargul



Dr. Jovin Kitau



Assoc. Prof. David Meya



Assoc. Prof. Angelina Kakooza



Prof. Moses Galukande

THRiVE-2 PhD Fellows



Mary Vincent Masha



Dr. Dinah Amongin



Dr. Denna Michael Mkwashapi



Dr. Gerald Mboowa



Dr. Susan Atuhaire



Dr. Trizah Koyi Milugo



Dr. Arthur Kwizera



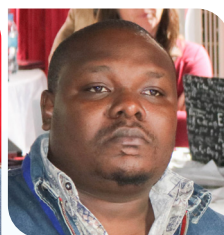
Dr. Rune Nathaniel Philemon



Dr. Richard Kwizera



Dr. Ruby Mcharo



Robert Kaaya



Dr. Imelda Namagembe



Dr. Jonathan Mayito



Martin Mbonye



Dr. Clara Wekesa



Dr. Peace Bagasha

Scientific citizenship

- These fellows have contributed to changes in policy & practice at institutional, national, regional and international level.



THRIVE through the eyes of Makerere University (2016-22)

Prof. Nelson Sewankambo
Director, THRiVE

Scientific Publications



Media Engagement by Numbers



No. of media
articles &
appearances



Documentaries
developed



Science
Communications
Trainings



Newsletters +
Magazine

Infrastructure Development



PhD Lounge, MakCHS



Research Support Centre

THRiVE-2 Fellows scientific achievements



Assoc. Prof. Arthur
Kwizera

Won £533,825 for a clinical trial to assess the effectiveness of low cost high-flow oxygen therapies in reducing ICU admissions for patients with AHRF



Dr. Emmy Okello

Modification of the Jones test for diagnosis of Acute Rheumatic fever for Low-income settings



Assoc. Prof. David Meya

New treatment for cryptococcal meningitis in Sub-Saharan Africa



Prof. Moses Galukande

Has conducted extensive research in breast cancer The Uganda Breast Society formation is on going Breast App 50% done New Breast Health treatment guidelines near completion



Assoc. Prof. Angelina Kakooza

Won a \$2.5m grant to clinically characterize patients with epilepsy, investigate the magnitude and drivers of epilepsy stigma among adolescents



Dr. Gerald Mboowa

Won the 2020 Anglophone Young Investigators Prize for his innovation, the rapid Microbial Analysis Pipeline (rMAP)



Dr. Edward Wampande

Won a grant that led to the establishment of the Centre for Bio security and Global Health Laboratory at Makerere University



Dr. Peace Bagasha

Spearheaded the integration of renal support care into routine care.

Lessons learned

- A consortium approach to building research capacity for African institutions is essential.
- A focus on several research priorities ensures that all institutions benefit from the program.
- Build infrastructure to support open science and data sharing
- Merit vs Equity in capacity building is real and needs to be paid attention to by the funding agencies
- Inter-institutional collaboration in mentorship and supervision should be taken into future programs.



Prof. Nelson Sewankambo
Director, THRiVE

THRiVE closes out the DELTAS-1 grant in an impressive conference

Racheal Ninsiima – THRiVE-Communications Officer

In the past, THRiVE's annual conferences have served as an important forum for research scientists to discuss and exchange original research on infectious, zoonotic and non-communicable diseases. This year's conference held between August 29 and September 1 at Serena Beach Resort in Mombasa recorded some firsts. For the first time, THRiVE held a preconference to enrich participants with skills and knowledge on how to close-out a grant. The preconference was held on August 27 and 28 and blended various topics such as best practices of grant closeout; closeout checklist; final financial reporting and monitoring, evaluation and learning. These sessions were led by a team from Science for Africa Foundation (SFA).

The main conference, held under the theme; 'Dissemination and sustainability of the achievements of THRiVE DELTAS-1 Program', offered participants both an in-person and virtual experience. Day one began with a keynote address from Dr. Elizabeth Bukusi, the former Deputy Director of the Kenya Medical Research Institute (KEMRI). She offered insights on how to achieve collaborative research in a global environment in her address titled; 'How to eat an elephant.' Here, she touched on the importance of mentorship in order to build a critical mass.

NOTABLE PRESENTATIONS

Throughout the week, institutional co-applicants, postdoctoral, doctoral and career development fellows made various presentations. The co-applicants spoke to the achievements

of THRiVE in their partner institutions.

Thirty-two scientific presentations on fellow's research and career progression were made. Numerous fellows spoke of publications from their research; career milestones and network collaborations. For example, Prof. Moses Galukande, a postdoctoral fellow from Uganda, told participants that he had won 10 other research grants since he joined THRiVE in 2017 and is in the process of establishing the first Uganda Breast Society, a platform to advance breast health research and practice. Another, Dr. Joel Bargul from Kenya said he had co-authored 30 peer reviewed articles since 2017 and won seven research grants. For Dr. Denna Michael Mkwashapi, a PhD fellow based in Tanzania, he was recently promoted to the post of Senior Research Officer at NIMR and made honorary lecturer at the Catholic University of Health and Allied Science (CUHAS).

Other notable presentations included one on open science by Caleb Kibet, a bioinformatician at the International Centre of Insect Physiology and Ecology (icipe) and a personal experience of having a bioinformatics career in limited resource settings by Dr. Gerald Mboowa, an implementation science expert for bioinformatics at Africa CDC.

All presentations were lauded. Intermittently, 12 short documentaries on fellows' scientific research; community engagement and women in science were displayed.

On the final day to mark the conference's closing, a panel discussion comprising of top research scientists in

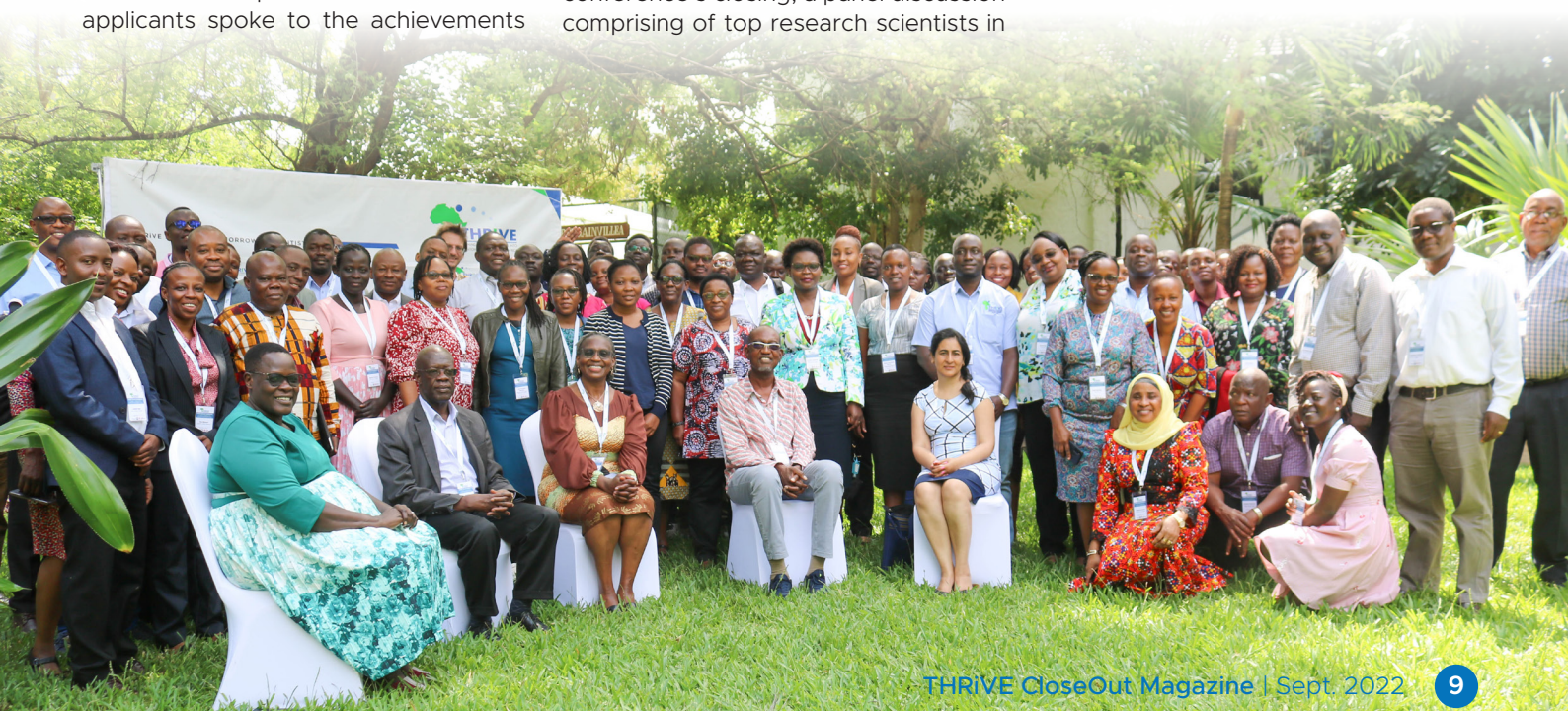
East Africa was held. Speakers were: Dr. Daniel Masiga, Principal Research Scientist and Head of the Human and Animal Health Theme at icipe; Prof. Dr Annette Nakimuli, Dean School of Medicine – Makerere University and Dr Saidi Kapiga, Scientific Director, Mwanza Intervention Trials Unit (MITU). It was moderated by Dr. Tabitha Mwangi, Programme Manager at Cambridge Africa. Discussions focused on the importance of mentorship to an early career scientist; motivating factors for these top scientists to come to work daily and lessons learned during their research careers.

"The center of gravity for African science has shifted and this is the best time to be a scientist. But remember, behind every good scientist is a good-able mentor. So go out there and get yourself a good mentor!" Prof Nakimuli said, responding to why it is important for scientist to be mentored.

On what motivates him to come to work daily, Dr. Masiga said;

"I come in order to find solutions to local problems that do not necessarily need donor funding."

Reflecting on the past five years of the DELTAS-1 funding, Prof Sewankambo, Director – THRiVE, closed the conference by encouraging participants to further push their research work to different publics and ensure that the THRiVE brand remains. The conference brought together over 80 participants from Uganda, Kenya and Tanzania.



THRiVE study highlights challenges of communities' response towards COVID-19 mitigation measures

The capacity built by DELTAS-1 was put to excellent use during the COVID pandemic. Using financial resources from the Government of Uganda to Makerere University, THRiVE was able to conduct a study to assess community perceptions about the existence and origin of COVID-19; its mode of transmission; signs and symptoms; prevention; control and treatment methods. The study team, led by Prof. Nelson Sewankambo, examined over 1200 men, women and children between November 2020 and January 2021. The team also sought to determine changes in the prevailing attitudes towards COVID-19 mitigation measures and communities' response to new social norms such as wearing of face masks. The study was conducted in Nakawa (10 villages) and Kawempe (20 villages) divisions of Kampala.

Using survey questionnaires, household conversations, focus group discussions and in-depth interviews, the study found that some respondents perceived COVID-19 to be non-existent and reported deaths were attributed to other causes rather than the disease. Given that the pandemic was first identified in China, some community members believed that it was a disease for whites and not people of black ethnic origin. Therefore, owing to the low perception of risk, many community members resented public health measures stipulated by government such as frequent handwashing and wearing of facemasks.

"Of the 835 participants surveyed, 675 (80%) did not wear masks at all, or wore them inappropriately such as under their chins, or foreheads or partially covering the mouth. Similarly, only 130 participants washed their hands regularly after greeting visitors, touching unhygienic objects or visiting restrooms," the report partly reads.

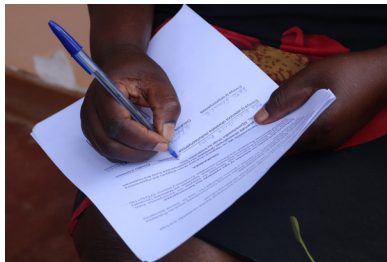
Notably, the low adherence was also reported among some of the enforcers of the social measures and was associated with 'prevention fatigue'. Furthermore, the study revealed that although there was correct knowledge and awareness about existence and severity of COVID-19 early during the epidemic, control of the disease was not well known. This breeds misperceptions about the disease that persists within the community and plays into vaccine hesitancy. Together these factors limit the effectiveness of efforts to control the pandemic.

Whereas at the time of the study there was no authorized COVID-19 vaccine anywhere in the world, misperceptions about COVID-19 vaccines and treatment were already prevalent. One of the strongest beliefs attached to the COVID vaccine is that it may hurt fertility, which is something very serious in the context of some faiths. Moreover, some respondents were of the view that there is no virus and it is just a propaganda of multinationals to sell their expensive vaccines.

"Many community members believed that traditional home remedies and religious practices could be effective for treating COVID-19 rather than vaccines. Even among those who believed in them, there were some who thought that they were not effective and suspected that they were fake and were being used by foreign entities to harm Africans," reads findings from the study.

It's no surprise that the introduction of the COVID-19 vaccine in the country has experienced low uptake.

Wholly, the study found that a contextually relevant community engagement model, which succeeded in mitigating Ebola has been absent during this pandemic in Uganda. The top-down approach by government in implanting COVID-19 prevention and control measures such as lockdowns was met with stiff resistance among vulnerable communities in the two Kampala divisions.



Wholly, the study found that a contextually relevant community engagement model, which succeeded in mitigating Ebola has been absent during this pandemic in Uganda.



This study was funded by the Government of Uganda through Makerere University Research Innovations Fund



UNIVERSITY OF CAMBRIDGE



CAMBRIDGE AFRICA

THRiVE through the eyes of Cambridge University (2016-22)



Professor David Dunne
Co-PI



Corinna Alberg
Former Programme Coordinator - THRiVE-2, Cambridge Africa



THRiVE (2016-22)

- Health research: mentorship PhD & post-doc fellowships
- Regional network (Kenya, Uganda, Tanzania, Rwanda)
- Wellcome Trust
- Africa Institutional Strengthening coordinator



Dr Pauline Essah
Former THRiVE Coordinator



'Our partnership with THRiVE led to the transformation of University of Cambridge after 800 years of existence'

Professor David Dunne

'Thank you THRiVE for doing an outstanding job of promoting excellence in African science & helping to improve a very old university'

Dr. Tabitha Mwangi



THRiVE Fellows visiting Cambridge



Cambridge senior & post-doc level visits support African projects in Africa



Dr. Caroline Trotter
Co-PI



Dr Tabitha Mwangi
Programme Coordinator - THRiVE-2, Cambridge Africa



Research Infrastructure

- Multifunctional Laboratories (Bio sciences)
- IT from 2mbps 120+ Mbps internet speed
- Grants desk establishment
- Research Policies and guidelines



Visibility

- Grants won by researchers increasing
- Scientific publications
- GU ranking improving



Research Systems

- GFPG, Graduate tracking, Accounting systems
- Training Researchers
- Training Grants management team

THRIVE through the eyes of Gulu University (2016-22)

Dr. Geoffrey Olok Tabo and Prof. Elizabeth A. Opiyo



Open Day

- Theme: Enhancing public and community inclusion in research and decision making
- Participants: local communities, districts, policy makers, researchers and GU Administration



Career Development Awardees & MSCs



5

Career Development Awardees



MASTERS

4

Masters



INTERNS

4

Interns

CPE

Community and Public Engagement (CPE) by MSCs

- GRRH on nutrition – Martha become a nutritionist with LoveOne
- Awere HC IV on Oncho – Oyet got PMI Vector Link USAID Project IRS Abt Associates in Tororo
- GRRH on Dr. Derrick – promoted lecturer and appointed acting head of department Surgery



Dr. Geoffrey Olok Tabo

IT Support Officer, THRIVE-2 Gulu University



Prof. Elizabeth A. Opiyo

Co-PI, THRIVE-2, Gulu University



Prof. Emilio Ovuga

Co-Aplicant, THRIVE-1 (2009-2015)

Dr. Amone surgically transforming lives of patients in Northern Uganda

Racheal Ninsiima – THRIVE-Communications Officer

Dr. Derrick Amone, a general surgeon and acting head of Department of Anatomy, Gulu University is offering an olive branch to numerous patients with surgical conditions in northern Uganda.

His determination to be a part of the great surgeons offering care to people in the Northern region paid off when he won a THRIVE-2 masters completion grant in 2017.

“The money I got from THRIVE helped me a lot because it facilitated study participants to undergo investigations which they previously could not afford and also facilitated them to return for follow-up,” he recalled during an interview with THRIVE.

Although numerous laparotomies (abdominal surgeries) on patients at Gulu National Referral Hospital and St. Mary’s Hospital-Lacor in Gulu district had been performed, prevalence data on surgically-treatable abdominal conditions was scarce in the region. Therefore, Amone took up the mantle to determine this prevalence and also understand short-term outcomes of laparotomy in both hospitals, which serve as Gulu University’s teaching hospitals. This was during his Master of Medicine in Surgery studies at the university.

For this research, 66 patients, aged 10 – 65 years, with abdominal conditions were recruited and underwent surgery between July and December 2017. Thereafter, they were followed up for 30 days. Results indicate that majority of patients requiring surgery suffered abdominal infection/peritonitis and this

was followed by intestinal obstruction and gut perforation. Additionally, during the 30 days follow-up, the most frequent complication observed among patients was surgical site infection followed by poor wound healing/dehiscence.

This work was published in the peer-reviewed journal, Archives of Gastroenterology and Hepatology.

Outstanding Case Studies

Among the most bizarre cases managed, Dr. Amone has found in a patient’s stomach during his surgical career is a 22cm-long toothbrush. The patient, a 56-year-old woman presented to St. Mary’s Lacor Hospital with chest pain, difficult breathing and abdominal pain. The surgical team, led by Amone, performed laparotomy to retrieve the toothbrush which still had all its bristles intact.

“Had the toothbrush not been removed, the patient would likely suffer chronic abdominal pain and it could have perforated who knows which part of the gut and caused peritonitis,” he said.

In another incident, he retrieved a toothpick from the abdomen of a 13-year-old boy who presented at Lacor hospital with peritonitis. The toothpick had punctured the duodenum wall, causing leakage of contents into the abdominal cavity, chemical irritation and peritonitis.

The first case was published in the AAS Open.

Dr. Amone says that the most humbling aspect of his work is when patients return to thank him for saving their lives.

“One time, I had an elderly lady kneel to say thank you to me by the roadside and this was very humbling,” he remembered.

Among the most bizarre cases managed, Dr. Amone has found in a patient’s stomach during his surgical career is a 22cm-long toothbrush.

Most challenging, however, is when patients come with emergency conditions to hospital at night and cannot be investigated. This is because the laboratory and radiology departments may not be operational at night which puts a patient at risk of not being fully investigated before laparotomy.

Career Growth & Prospects

As a master’s student, Dr. Amone was recruited as a graduate trainee in Gulu University’s Department of Medicine pending promotion to the post of lecturer after his studies. After bagging a Master of Medicine in Surgery in 2020, he earned the promotion and was recently appointed acting head of the Department of Anatomy.

“If I hadn’t graduated on time, I would not have been appointed and this is why THRIVE funding was timely and Godsent. I am looking for PhD sponsorship to ensure that by next year, I start my PhD,” the general surgeon said.



From career awardee to an emerging research leader

Assoc Prof Richard Echodu - the Director of Gulu University Multifunctional Research Laboratories



I am an associate professor of molecular biology and genetics at Gulu University and the director of the university's multi-functional research laboratories. I won THRIVE's Career Development Award (CDA) fellowship in 2018 and my research proposal under this fellowship was a continuation of my PhD work which focused on mosquito resistance to different insecticides. The purpose for me applying for this award was to ensure that I develop my career in order to establish myself as a good scientist. My study examined the population dynamics of anopheles mosquitoes and their level of insecticide resistance to pyrethroids in northern Uganda. I sought to determine, with the aid of molecular techniques, malaria vectors and their insecticide resistance levels. The study was conducted in Gulu, Oyam, Agago and Kitgum districts.

What clearly came out of this research is that mosquitoes had become resistant to a number of chemicals and this directly calls for government action to change the approach of Indoor Residual Spraying (IRS). The insecticides that are working should be the ones that are applied. However, their use should not be prolonged because the vector will become resistant. So far, I have produced two publications out of this work and I sit on the steering committee for insecticide resistance in Uganda.

In order to sustain work on insecticide resistance, Gulu University partnered with VectorLink, a program which supports the planning and implementation of IRS campaigns.

Community Engagement

During my research, I interacted with different homesteads in a bid to understand the dynamics of malaria management. In some families we visited, we found that it's only the father and mother that sleep under a treated bed net, leaving out the children. Therefore, I had to bring it to the attention of the families that it is important for every household member to sleep under a bed net. Additionally, some households did not want their houses to be sprayed because of myths such as the chemical causing sterility in men or bringing bad omen. We had to educate them and assure them that the chemicals are approved by government and they control malaria.

My professional target is to become a full professor, build a strong research capacity at Gulu University by training more researchers and to create innovations that address common man's problems such as malaria and sleeping sickness.

On a wider scale, we interacted with village health teams (VHTs), vector control officers and district health officials (DHOs) in a bid to share our research findings with them. What came out prominently from our work is that there is resistance going on and what can we do to avert insecticide resistance in the country. This experience afforded me the opportunity to conduct more studies to find alternative insecticides that communities may use.

Other research works

As an extension of the work on insecticide resistance, our research team conducted a small trial in Karamoja and we found that mosquitoes in that region have developed resistance and they eat the insecticides that treat the bed nets in what is called metabolic resistance. Moreover, they have adopted to the lifestyle of the Karamojongs who love keeping outdoors hence accelerating malaria transmission. Because Karamoja is a neglected area, we are trying to identify ways of doing more research here.

Since the CDA ended in 2021, I have been awarded two additional sub-awards under NIH. These are five-to-six-year projects focusing on transmission of parasites in trypanosomes that spread sleeping sickness and nagana. We want to understand how the parasite develops in the tsetse fly and we also aim to identify ideal molecules which could be used for vaccine development to block transmission and improve diagnostics.

Furthermore, I have an ongoing program on food safety in northern Uganda. This arose out of the situation when we had a mysterious disease called Nodding Disease. Since the exact cause of the disease remains unknown, we tried to examine the quality of food eaten by people in northern Uganda and found that 60% of the food eaten isn't good for public consumption because of high levels of aflatoxins. We have 2 PhD students under this project and their research is examining how much aflatoxins people are consuming and what measures can be used to control the contamination of food.

Career Promotion

I was promoted to the level of associate professor by Gulu University in February 2022 after completing my CDA. For promotion to happen, I needed to have a good track record of publications; must have supervised PhD students and contributed to research infrastructure at the university. The papers from the CDA fellowship were among my key publications because I was the first author. For research infrastructure, I was instrumental in establishing the multifunctional research labs, a shared research facility accommodating researchers in the medical, agricultural and natural sciences fields. In the medical field we are examining human diseases like COVID where we are doing a lot of work in screening and sequencing to identify the different viruses of the disease that are circulating in the population.

My professional target is to become a full professor, build a strong research capacity at Gulu University by training more researchers and to create innovations that address common man's problems such as malaria and sleeping sickness.

THRiVE scientist leads team to develop waterbuck-scented perfume to protect animals from tsetse flies

Racheal Ninsiima – THRiVE-Communications Officer

Researchers at Gulu University led by Assoc Prof. Richard Echodu, a THRiVE Career Development Fellow, have developed a water-buck scented repellent to protect livestock and people from tsetse flies. Tsetse flies transmit the deadly cattle-disease, nagana, which weakens the animals' meat and milk production capacities. In humans, they transmit sleeping sickness, a life-threatening disease associated with severe neurological conditions including poor coordination and confusion.

This new optimized tsetse repellent comprises of four chemical elements derived from a waterbuck's skin odor and is effective against two savannah tsetse fly species. These are: *Glossina morsitan submorsitans* and *Glossina pallidipes*. The researchers observed that tsetse flies avoid waterbucks, large antelope species found in sub-Saharan

Africa, because they find the animals' smell repellent.

To test the new repellent blend, the research team outfitted over 1000 cows with the perfume sachets and tracked

This scented blend has been approved by the National Drug Authority for wide scale use and is packaged in small transparent sachets that cost between UGX 2,000 & 5,000.

them for two months. They found the repellent to be effective in preventing infections among the cows that had been fitted with the sachet compared to those which did not have it.

"The repellent has direct application to our farmers and has been found to

reduce disease rates among animals by more than 80 per cent. It may also be used by tourists who go to the game parks that may be tsetse infested and to the military who are deployed in high-risk areas," said Assoc Prof Echodu, Director, Gulu University Multifunctional Research Laboratories in an interview.

This scented blend has been approved by the National Drug Authority for wide scale use and is packaged in small transparent sachets that cost between UGX 2000 and 5000. In terms of application, the perfume sachet is placed a small handmade pouch with strings which are tied on the tail of an animal. It can also be tied on the neck of the animal or on belts of people. Echodu says this perfume may be used in shampoo and can also be masked in t-shirts.



Assoc Prof Richard Echodu displaying the repellent during an interview with THRiVE



A waterbuck

Impact of ivermectin treatment on River Blindness control in Pader district

Sam Oyet - THRiVE-2 MSc Fellow.



Under the THRiVE masters fellowship, I undertook research to find out the impact of ivermectin treatment on onchocerciasis (River Blindness) in Awere subcounty, Pader district. Although the district's local government implemented Ivermectin Mass Drug Administration for 10 successive years, (2008-2018), no evaluation of the impact of the drug on prevalence of River Blindness has been done.

So, for my master's research, I sought to understand how this drug has improved lives of affected individuals, especially those who had nodules/swellings and

whether it (the drug) had reduced the number of microfilariae (microscopic worms) in the body.

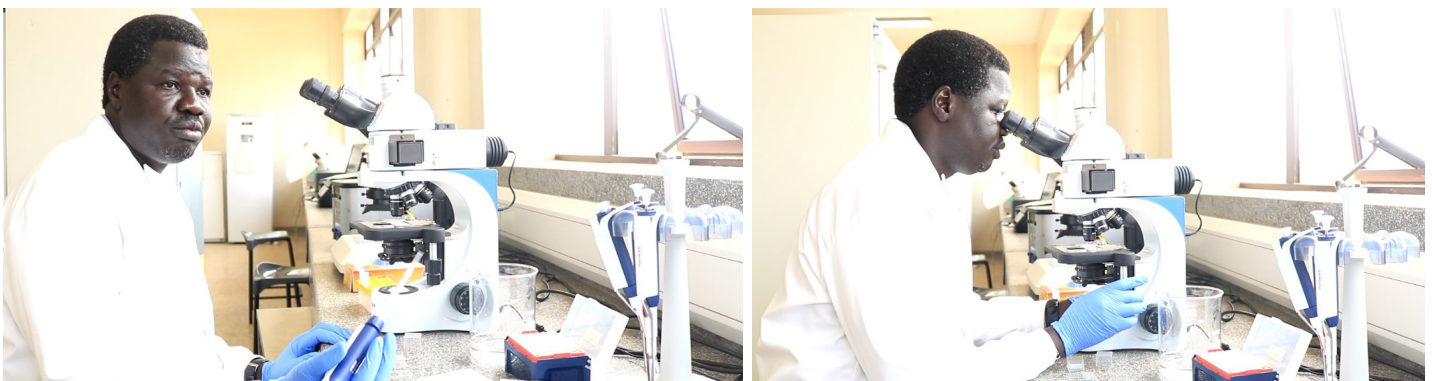
OBTAINING DATA

First, I conducted a baseline survey dubbed, Rapid Epidemiological Mapping of Onchocerciasis (REMO) in order to establish the prevalence of River Blindness in Awere subcounty before Mass Drug Administration was done in 2008. The baseline was conducted on 100 people aged above five and these were screened for Onchodermatitis / leopard skin and examined for skin microfilariae and nodules.

Following on, I conducted a post Mass Drug Administration assessment between March and April 2018 to determine the number of new cases from River Blindness. 384 men, women and children aged five and above, adjudged on clinical grounds to have River Blindness were enrolled for the study. Data on socio-demographic characteristics of study

participants including age, gender, number of years of residence and history of previous treatment for River Blindness was collected using a semi-structured questionnaire. Also, Clinical examination for detecting signs and symptoms of the disease such as skin swellings/nodules, leopard skin, skin itching and hanging groins was done by trained health workers.

To determine the quantity of microfilariae in one's body, two skin snips (tiny bloodless skin samples) were taken from behind the buttocks of each patient using lancets and surgical blades. The snips were incubated in normal saline for 24 hours to allow for complete emergence of microfilariae from the skin samples into saline solution. This was done at Pajule Health Centre IV. Thereafter, the saline solution was brought to the Multifunctional Laboratories at Gulu University for examination under a microscope to identify the microfilariae in the skin snip sample.



Oyet examining saline samples for the presence of microfilariae in the Multifunctional Labs at Gulu University

FINDINGS

Study results showed that there was a reduction of microfilariae prevalence in the study population from 76.2% at baseline in 2008 to 17.4% in 2018. This implies that there was a reduction of 58% in the prevalence of microfilariae. However, prevalence was higher among participants over 15 years compared to those aged 5-14. This result suggests that older people in Awere sub-county are strongly associated with higher microfilariae prevalence in their skins than younger ones.

Additionally, there was a reduction in the prevalence of nodules/swellings from 9.4% in 2008 to 1.7% in 2018. Onchodermatitis / leopard skin prevalence was found to be 8.1% down from 21% in 2008.

Therefore, the study confirmed that ivermectin was effective in treating River Blindness. As a way forward, I recommend that the Ministry of Health continues to provide the drugs to local communities because microfilariae prevalence is still unacceptably high (17%) despite the decade long control and elimination program through Ivermectin Mass Drug Administration. Additionally, maintaining continuous area-wide monitoring of the control programme is required and control measures such as vector control through larviciding (application of chemical insecticides to water bodies) using temphos.

CAREER PROGRESSION

After completing my Masters studies, I was employed as a District Coordinator

/ technical specialist with the Presidential Malaria Initiative – VectorLink, Abt Associates Inc, Indoor Residual Spraying (IRS) Project in Tororo district. My role is to perform programmatic and management oversight for all aspects of the project's spray operations, including campaign planning, technical assistance and training, logistical and operational support and supervision, and activity tracking and reporting.

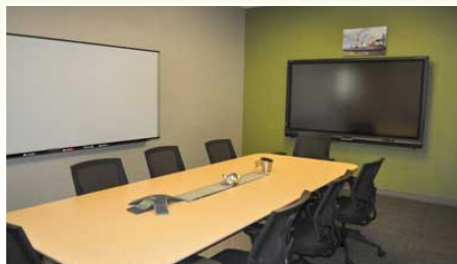
Work aside, I am undertaking another Masters in Public Health at Lira University in my pursuit to become a lead researcher in the field of Neglected Tropical Diseases and Malaria. To consolidate this dream, I hope to pursue a PhD in Medical Entomology or Parasitology in future.



Research Management and Environment:



Infrastructure Development



- State-of-the art instrumentation in Chemistry and Molecular Biology
- Support in developing videoconferencing facilities
- Involvement of *icipe* with Association of African Research Administrators (AARA)
- *icipe* assisted THRiVE in developing its Conflict-of-Interest Policy.



Research Training

- Productive careers of THRiVE fellows: Lecturers in Higher Institutions of learning – Joel and Trizah
- Expansion into new and neglected research areas
- Research leadership: organisation of training courses
- Skills exchange between *icipe* faculties and other partner institutions
 - ⇒ Joint student supervision
 - ⇒ Leadership role serving in committees
 - ⇒ Grant opportunities and expand research collaboration and network
 - ⇒ CDA, Cambridge Alborada Fund

Scientific Quality

- Training the next generation of Vector-borne disease researchers



1
PostDoc



1
PhD



2
Masters



10
Interns

- High quality publications



>20 THRiVE-2 direct publications

- Enhanced skills in grant writing, budgeting, management, institutional policies
- Culture of research excellence- many awards & recognition
- Productive careers: Lecturers in State universities

THRiVE through the eyes of *icipe*

Dr. Dan Masiga and Dr. David Tchouassi

THRiVE-2 Beneficiaries



Dr. Joel Bargul



Dr. Trizah Koyi Milugo



Dr. Jandouwe Villinger



Brenda Odhiambo Kisia



Scientific Citizenship

- Adoption of Schools- community engagement impacting over.....
- Institutional Leadership Role: Jandouwe Villinger (Head-MBBU); David Tchouassi (Senior Scientist)
- Scientific Technical working groups: WHO, Kenyan MoH; Onchocerciasis, Leishmaniasis: Dan Masiga, David Tchouassi
- Drafting of policies/Strategy documents
- Journal Editorial responsibilities
- Overall opportunity to advance *icipe*'s leadership portfolio in innovative vector-borne disease research, and capacity building and training of next-generation of global research leaders



Dr. Dan Masiga
Co-PI



Dr. David Tchouassi

Towards becoming an independent researcher, Joel Bargul shares his experience



Dr. Joel Bargul –Head of Department Biocheistry, Jomo Kenyatta University of Agriculture and Technology (JKAUT)



Research topic: The role of livestock keds in transmission of veterinary and zoonotic diseases in arid regions of northern Kenya

Introduction:

Trained as a biochemist and molecular biologist with a doctoral thesis on African trypanosomiasis, following my earlier master's thesis on the biology of tsetse fly, the definitive vector of trypanosomes that cause human sleeping sickness and nagana in livestock. After graduating with a degree of Doctor of Science (*Magna cum laude*) in Molecular Parasitology and Infection Biology on the 3rd July 2015, I returned to Jomo Kenyatta University Of Agriculture And Technology (JKUAT) to continue teaching as a Lecturer. Shortly after, I applied and won a highly competitive THRiVE-2 postdoctoral fellowship in 2016 to study camel trypanosomiasis and the role of keds in disease transmission. For the first time, I got a chance to formulate an original hypothesis, develop and refine the research idea into a full research proposal or protocol, and hypothesis testing through experimental studies. My work was hosted and mainly based at *icipe*, Nairobi.

The THRiVE-2 fellowship provided a unique opportunity to gain experience in research by making it a requirement to choose experienced research mentors. I was lucky to have two research mentors Prof. Mark Carrington from the Department of Biochemistry, University of Cambridge, UK, and Dr. Daniel

Masiga, the current head of Animal Health Theme at *icipe*. Both mentors have decades of research experience working in the field of African trypanosomiasis and have contributed immensely to my success in this study. Additionally, THRiVE organized regular capacity building programmes such as the hands-on training workshops where I acquired skills in research leadership and grant-writing.

The secretariat also pushed for more Community and Public Engagement (CPE) activities to be done by the fellows, as well as adopting a high school for mentorship and research engagement. At the beginning of my study, I was hesitant to adopt a school because I had limited understanding on the role of CPE and how to design CPE activities. However, after undergoing training, I was able to do adopt Laisamis Secondary School (LSS).

Community and Public Engagement (CPE)

During our field visits in Laisamis, we observed that most households retained one or two children of school-going age at home to help in livestock care at the expense of their education. Thus, we aimed to determine the influence of socio-cultural factors on access to education by children. Focus group discussions with the students of Laisamis Secondary School (LSS) were conducted to determine the influence of socio-cultural factors on education, class performance, and progression to higher levels of education.

Nine socio-cultural factors that contribute to school dropout among girls were identified namely: early marriage, early pregnancies, lack of school fees, poor performance in exams, lack of interest in education, unsupportive parents who do not value the education of the girl child, cultural pressure to

be circumcised before joining school, negative influence from friends who do not go to school and the lack of basic needs such as clothes and food. On the other hand, boys identified seven factors namely: drugs and substance abuse, lack of school fees, poor performance in exams, lack of interest in education, attending to livestock herding duties at home, expulsion due to disciplinary cases and negative influence from friends who do not go to school.

Key achievements

Over the last four years, I have demonstrated research leadership in various ways. First, by developing an original idea or hypothesis that camel keds could transmit diseases followed by rigorous experimental studies to test this. This generated new knowledge on vector competence of keds to transmit anaplasmosis, which forms basis for establishment of keds control programmes for improved health.

This study continues to generate new discoveries that motivate further studies.

Furthermore, during my postdoctoral research fellowship (2016 – 2020), I attracted eight additional research grants, either as a PI or Co-I, amounting to USD 303,039 to study camel health and engage stakeholders and high school students in our research. I have also established five research collaborations both nationally and internationally, and co-supervised MSc and PhD students.

Since 2017 I have published 25 journal articles. I wrote two blog articles on camel health and keds, both were published by Cambridge-Africa (www.Cambridge-Africa.cam.ac.uk), and also authored three THRiVE newsletter articles.

Additionally, I was voted first place winner by the International Livestock Research Institute (ILRI) CapDev Grand Challenge 2020 following the three-minute research-pitching contest.

I was also recognized by *icipe* for being among top five postdoctoral fellows for publishing 17 peer-reviewed journal articles during 2020 – 2021. I attended over 20 international scientific conferences and in 2019, I was invited by the African Association of Insect Scientists (AAIS) to deliver a keynote speech on my work during a conference in Abidjan, Cote d'Ivoire.

Acknowledgements

I acknowledge the financial support primarily received from THRiVE-2 and additional funding from other donors. I am grateful to the following; *icipe* and JKUAT for research and institutional support, livestock farmers, field assistants, enumerators, and all members of the community who supported this study, Laisamis Secondary School, mentors and supervisors, and all interns and postgraduate students who participated in this successful study.

My experience as a THRiVE MSc Fellow: A Challenging yet exhilarating path of learning

By Tamre Richard Mwanda, THRiVE MSc Fellow, *icipe*



I joined *icipe* as a THRiVE-2 MSc Fellow after completing my undergraduate degree. Although I had gained a substantial amount of knowledge during my undergraduate programme, most of it lacked the practical experience necessary in the scientific research field. As an *icipe* THRiVE-2 MSc Fellow, the opportunity offered the perfect bridge to the industry by providing an environment to get hands-on experience.

This, attained with the help of invaluable supervisors; all of whom have aided, in the understanding of health challenges we face globally and the efforts we seek to address the challenges. Furthermore, the opportunity has allowed me to tap into an extensive network of extremely passionate, smart, friendly and capable fellows and alumni who are doing amazing work in their careers. I could not have imagined a better way of being welcomed into the scientific world. I am amazed at how much I have learned so far.

The research project we are undertaking concerning exploring a potential attract and- kill strategy for the control of gravid malaria vector (*Anopheles gambiae sensu stricto*), is exciting, stressful, exhilarating and frustrating; a constant roller coaster every minute of each day. With weeks of thorough experimental setups, data collection and writing to meet both set objectives and university expectations, most of the challenges I have encountered are simply summarized into one major challenge, time. The sponsorship timeline set to finish my work, synergized with my university's requirements which overlap with experiments that suffer huge setbacks; due to factors such as the unpredictable and uncontrollable nature of test organisms to be unresponsive, prolongs the working timeframe.

Nonetheless, I have learned so much! My time as a THRiVE-2 MSc. Fellow in *icipe* is one of the most productive I've had in my life and I feel much more confident transitioning from academia into a fully-fledged scientific researcher; in growing as an individual in research, and ultimately in the process of achieving great things.



Research Training

Fellows & Effects

 2
  4
  4

THRIVE KCMUCo Team



THRIVE
through
the eyes of
KCMUCo
 Prof Sia Msuya



Spill over effects

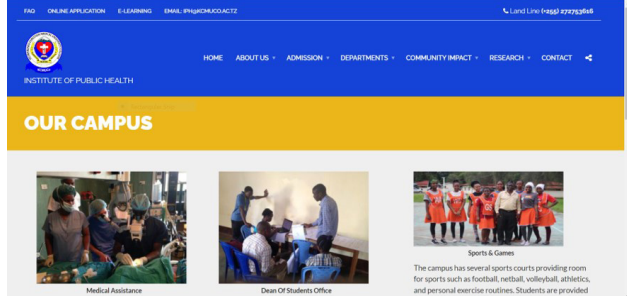
-  MSc students/ BSc Lab students used data
-  PhD student using part of data
-  Development of diagnostics techniques
-  Supervising undergraduates & co-publishing
-  2 are now into PhDs (due to master's research)
-  2 masters & clinicians mentored
-  > 10 undergraduates supervised
-  Publications with mentored students

KCMUCo Policies

- Antibribery
- Data Scurity Policy
- HIV/AIDS policy



SYSTEMS: IPH website



Prof. Sia Msuya
Co-PI

How I have grown professionally since completing my PhD

Dr. Florida Muro – Director, Institute of Public Health, KCMUCo



I was one of the first THRiVE-1 PhD awardees and officially began my studies in 2011. My thesis focused on the accuracy of diagnosis of non-severe pneumonia among children below five years. Through this study, I was able to demonstrate that whenever clinicians do diagnosis based on clinical presentations, we end up doing empirical management. This is inaccurate to what is generally accepted in general management of disease. With this PhD, I have garnered many achievements up my sleeve and done much as a young scientist. I am

now a senior lecturer at the Kilimanjaro Christian Medical University College (KCMUCo) and supervise, mentor and teach PhD, masters and undergraduate students. Furthermore, apart from being the head of the Community health department at KCMUCo, I was recently appointed as Director, Institute of Public Health after Prof. Sia Msuya, my mentor.

As Director, one of my roles is to spearhead community and public engagement (CPE) activities. During our time in THRiVE-1, we didn't incorporate CPE in our research projects. However, I came to learn of it and have since endeavored to include it in the work that KCMUCo does. Although the institution was already doing community outreach and engagement with community health workers, it wasn't in a systematic way. Not many of those who were receiving the services gained the best. We have been improving on this. For example, when COVID-19 hit, I and other members of institute did a lot of community awareness through markets, schools, on radio and in different government offices. We were able to publish this work in the African Journal of Medicine. This experience taught me the importance of involving the lay public, policy makers and school children in science in order to pique their interest. Whenever I am applying for a research grant, I include a section on CPE because these days, one tends to win grants if he/she shows that they care about the community.

Also, my research career has grown beyond a focus on pneumonia. Lately, I have been researching on antimicrobial

resistance and I am being supported for a post doctorate in the same under MRC-UK. My postdoctoral research is examining antimicrobial drug utilization within the different tiers of Tanzania's health system i.e., health center level, regional and zonal hospitals. Hopefully, by the end of 2022, I will be able to submit manuscripts for publication.

Furthermore, I was awarded a one-year fellowship by the NIH Global Health Fund to conduct research on antimicrobial use for children under five. I have a lot of data to work with and I believe I will be able to contribute new information on antimicrobial resistance in this young age.

The training and mentorship received under the THRiVE program supported me in building research skills and for the first time, I was able to publish as first author. Moreover, I met a number of other scientists, some of whom we have formed collaborations and applied for research grants.

Going a step further as a research scientist I believe I am in position of running a grant independently. Sometimes you write but you don't get encouraging feedback although I take this positively and it encourages me to work even harder at applying for other grants.

Remember, science is not only for men but women can equally contribute. We shouldn't entertain the myth where people think that women shouldn't pursue further education.

From the classroom to the Studio and the community!

By Dr. Ruby Doryn Mcharo, THRiVE-2 PhD Fellow

On 4th of May 2022, a warm Wednesday morning, we had more to celebrate beyond the Eid-al-Fitr holidays. Our Research Enrichment-Community and Public Engagement (RECPE) output was being launched. The event was graced with the presence of the Deputy Minister and Member of Parliament, Special seats (Women) for Mbeya, Eng. Maryprisca Mahundi, Mbeya urban District Commissioner, Dr. Rashid Chuachua, Loleza Girls' Secondary school Administration, Loleza secondary students and media representatives. The RECPE project applied a human-centered design and

involved 62 Advanced Level (A' level) students who shared their own pure original ideas, attributes and concepts related to interventions around Sexual and Reproductive Health (SRH) matters.

This RECPE project was a part of enhancing impact of the THRiVE PhD work on *“Sexually Transmitted Infections (STIs) and sexual behaviour among young adults attending Higher Learning Institutions (HLIs) in Mbeya region, Tanzania”*. Findings from this work noted high prevalence of asymptomatic Chlamydia among HLI students especially females, and risky sexual behaviours which put young

adults in HLIs at risk to sexual health threats. It was also noted that about seventy percent of the study participants had received SRH education while in secondary and/or primary school but were found to have unsatisfactory level of comprehensive knowledge on STIs. Furthermore, while growing up during adolescence a large proportion of the participants could not discuss or found it difficult to discuss SRH and sexuality matters with their parents/guardians and this was alarming. Our RECPE project, based on these findings, considered all these setbacks in the life of an adolescent while growing up and



brought together the group from Loleza to brainstorm on targeted means to reach this population of young people and improve their awareness to matters relevant to SRH to them.

Students were encouraged to think creatively on their preferred targeted ways relevant for communicating health awareness/education on adolescents' SRH. The team at Loleza, after a number of FGDs and orientation sessions, finally opted to use music, such that engaging young people needs to be fun, this can easily catch their attention and they can follow the message through. They drafted lyrics and tune for a song titled **"Yote yanawezekana"** (Swahili for "Everything is possible") after deciding on the content that felt relevant for young people. The song lyrics reflect dialogue from one adolescent to another on issues of STIs, where they mention Chlamydia, Gonorrhoea, Herpes, Human Papilloma Virus, and Syphilis and their clinical consequences as well as means of prevention. The song further encourages young people to initiate dialogue with their parents/guardians in order to understand better on their sexuality and SRH; as well as

inspire their peers that a generation of young people free of STIs is possible. With permission from the school administration, students were allowed to record this song in a studio; and with the help of an experienced music producer managed to finalise the 6-minute vibrant, catchy and interesting song.

During the launch, we had interesting discussions on how to take this work to benefit our community with the Guest of Honor.

During my opening remarks, I requested the Deputy Minister to be also an ambassador of this work, to support this work to reach even the Minister for Health as well as the Minister for Education so that our objectives for RECPE get realized. This song and the content in it could be added as part of the SRH curriculum in schools to make learning interesting and fun. After the official launch, we handed a number of the CDs to her as well. During her remarks, the Guest of Honor appreciated our invite and the great effort and work that has been put to make our RECPE project a success. She

acknowledged that young people like music and she believes this is indeed a friendly way of sending across the targeted message and it shall reach a wider audience. She further pledged to make sure this message is widespread in Mbeya region; and noted that this project has challenged them to assess even other means of delivering the SRH education, strengthening access to SRH and that they have also learnt the importance of involving young people at the centre of matters that involve them.

To conclude, she counseled the students on the benefits of delaying sexual debut and to focus on things that currently matter to them such as their education and the desire to academic excellence. One of the students who took part in the project thanked the team and Guest of Honor, promised to be a champion to her community and expressed her appreciation being involved in the project and all that she got to learn.

We thank DELTAS Africa and THRiVE for the funding and support for making this work a reality.



THRiVE PhD fellow, Dr. Ruby Doryn Mcharo (left), Guest of Honor - Deputy Minister and Member of Parliament, Special seats (Women) for Mbeya, Eng. Mary Prisca Mahundi (centre) and Mbeya urban District Commissioner, Dr. Rashid Chuachua (right) during the official launch of the RECPE project output.



Some of the students from Loleza Girls' Secondary school enjoying the performance of the song they created during the RECPE project.



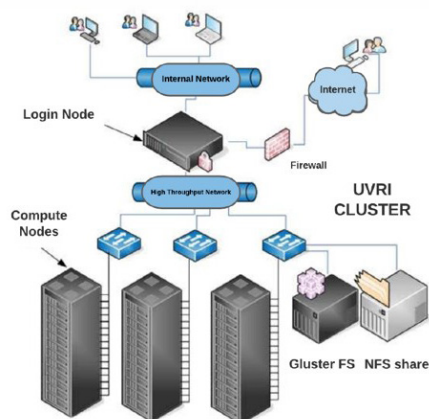
UVRI



Computation hardware upgrades at UVRI

ical HPC cluster Architecture

atic representation of the proposed HPC infrastructure is shown in Figure



Proposed HPC Cluster Architecture at UVRI

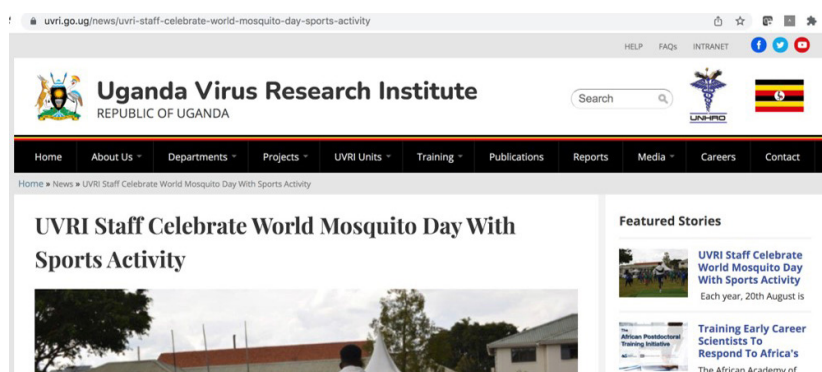
THRIVE through the eyes of UVRI

Dr. Jonathan Kayondo & Prof. Janet Seeley

Technical & Professional skills upgrades- Advanced short- courses/ Workshops

- Effective communication (2021)
- Research Management (2020)
- Scientific Writing (2019)

UVRI Website



Supporting COVID-19 diagnostic testing



Lab Equipment



Prof. Janet Seeley
Co-PI



Dr. Jonathan Kayondo

UVRI Bioinformatics Core Laboratories receives a new Nexus Gradient Master-Cycler with funding from THRIVE-2

Naluwuge R, Kayondo J and Nyanzi E.

The Uganda Virus Research Institute (UVRI) Bioinformatics Core laboratories have for the last 10 years received support from THRIVE. The laboratories are used by partners, PhD students attached to UVRI and visiting scientists to conduct experiments that require Polymerase Chain Reaction (PCR).

In the current THRIVE-2 grant 2016-2021, UVRI procured and received a new Nexus Gradient thermocycler Master-cycler in 2021. The Master-cycler has made research better with the new Nexus Gradient Master cycler from Eppendorf. The new machine is used in PCR amplification (multiplication) to make copies required for DNA samples. The cycler quantifies and sequences the samples with better security features like safe mode. This instrument also supports USB devices and offers excellent reproducibility with low noise emission which makes it even suitable for environments where complex experiments are being conducted. The Master Cycler unlike the old versions of PCR machines, allows the use of a wide variety of consumables for example the 0.5ml tubes, the PCR plates and strips and therefore a correspondingly wide range of reaction volumes. Its software also allows a booking schedule for the instrument and receives an email notification at the end of the PCR cycle.



Prior to the purchase of the Master-cycler, research involving PCR amplification in the Core laboratories was done using the Gene Amp PCR system 9700. UVRI therefore does not consider the Master cycler an ordinary PCR machine but rather a molecular biology asset from which the best results will be derived. It will be efficiently used and properly maintained for future users.

UVRI acknowledges the financial support that purchased this equipment by THRIVE-2 through the DELTAS Africa Initiative # DEL-15-011 to THRIVE-2.

From Despair comes Hope: How THRiVE changed the course of my destiny

Phionah Tushabe, Research officer - UVRI

Author Frederick Douglass once said, "If there is no struggle, there is no progress". This statement summarises my Master's journey. I started my Master's degree journey in August 2015 at the College of Veterinary Medicine, Animal Resources and Biosecurity (CoVAB), Makerere University. I was determined to complete the course within the stipulated two years but like the bible says in Proverbs, "We may make our plans but God has the last word". The first year of the course went smoothly and I was able to complete the taught part of the course on schedule. The second year started off well with me completing and presenting the research proposal to the College. What happened after this is a true testament to Frederick Douglass's statement. With no funding prospects for the practical laboratory work, time flew by and before I knew it, I was a "third" year student pursuing a two-year course!!! In June 2018, I was

privileged to receive a THRIVE-2 Master's research fellowship. With this funding came hope and renewed strength to complete the course, so much so that the entire laboratory work [extraction of viral ribonucleic acid, polymerase chain reaction (PCR) and sanger sequencing] of the 104 samples was completed in two weeks. Long story short, I completed and graduated with a MSc. in Molecular Biology (with a distinction) at the 70th Graduation in January, 2020.

I work with the Expanded Programme on Immunization Laboratory based at the Uganda Virus Research Institute (<https://www.uvri.go.ug/>). This laboratory serves as a Measles Regional Reference Laboratory in the WHO/AFRO region serving Burundi, Rwanda, Tanzania, Kenya, Comoros, Eritrea, Ethiopia, South Sudan and Uganda. The laboratory is also an Inter-country Polio Laboratory serving Burundi, Rwanda, Tanzania,

South Sudan and Uganda. The research I did characterized non-polio enteroviruses isolated from Acute Flaccid Paralysis (AFP) patients in Uganda. AFP normally resolves within 60days but in these patients, there was residual paralysis seen after the 60days leading to the question of whether non-polio enteroviruses cause residual paralysis. In addition to characterizing these viruses, this work identified a previously unknown genogroup of Enterovirus A71 species, one of the species responsible for huge outbreaks of Hand, Foot and Mouth disease in the Asia Pacific region. The manuscript was published in the Medical Virology journal in 2021; PMID:33458840. Building on this work, the laboratory has started sequencing non-polio enteroviruses obtained from the on-going polio environmental surveillance in a bid to know the diversity of the circulating viruses in the country.

In addition, I was recently awarded a research fellowship from the NIHR Global Health Research group project on the Application of Genomics and Modelling to the Control of Virus Pathogens (GeMVi) (<https://kemri-wellcome.org/gemvi/fellows/>). For this work, the goal is to carry out whole genome sequencing of enteroviruses from acute flaccid

paralysis patients in Uganda to identify any co-infecting viruses that may lead to acute flaccid paralysis as well as look at the evolutionary and recombination patterns of these viruses.

I am building on the lessons learnt, experiences gained, professional and personal relations made to prepare for the next phase of my academic

life. I cannot thank THRiVE-2 enough for holding my hand during one of the most challenging times of my academic life. I believe that without the support from THRiVE-2, none of the above achievements would have been obtained. And like William Shakespeare said, **"I can no other answer make, but, thanks, and thanks."**



thank you

I cannot thank THRiVE-2 enough for holding my hand during one of the most challenging times of my academic life. I believe that without the support from THRiVE-2, none of the above achievements would have been obtained.



THRIVE through the eyes of The London School of Hygiene & Tropical Medicine (LSHTM)



Prof. David Mabey
Co-PI



Prof. Philippe Mayaud
PhD Supervisor

London School of Hygiene and Tropical Medicine hosts THRiVE-2 Fellows

By Prof. David Mabey and Eleanor Martinis

Between January and March 2018, London School for Hygiene and Tropical Medicine (LSHTM), one of the THRiVE-2 northern partner institutions hosted three THRiVE Fellows from Tanzania, who braved the English winter to spend time with their colleagues and co-supervisors at LSHTM. Mary Moshia from KCMUCo was visiting her co-supervisor Prof Suzanne Filteau and taking a study module on Statistical Methods in Epidemiology. Dr. Ruby Mcharo from Mbeya was visiting her co-supervisor Prof. Philippe Mayaud, and taking study modules on the Control of Sexually Transmitted Infections and on Qualitative Research Methods. Robert Kaaya from KCMUCo was visiting his co-supervisor Prof. Chris Drakeley, other members of the Malaria Centre, and the national Malaria Reference Lab at LSHTM.



My visit to LSHTM gave me valuable exposure to experts in my field Mary Vincent Moshia, THRiVE-2 PhD Fellow

Mary Vincent Moshia, THRiVE-2 PhD Fellow

It was a great pleasure to be back to my former school, London School of Hygiene and Tropical Medicine in 2018 as alumnus. I was inspired by the teaching methodology and interactive assisted practical sessions while attending the Statistical Methods in Epidemiology Course (SME, 2018). The course has widened my knowledge base and given me confidence in my field of study.

My northern supervisor Prof Suzanne Filteau introduced me to the LSHTM nutrition group which is composed of experts in nutrition research. I had the opportunity to present my work at their seminar series. The experts provided valuable suggestions and recommendations to my work. I realize that sharing your ideas in a professional community is an important strategy.

London was very cold, cloudy and gloomy! It was a surprise to see the sun for the first day on the 25th January 2018! I was greeted with a ray of sunshine, and this made my day. It was also exciting to be with my Tanzanian network group and supervisors for lunch at the Life Goddess restaurant; this was fantastic! It was such a relaxing time, away from books for some hours, bonding and recharging, we really enjoyed food together with lots of laughter (mhh, but the portion sizes ohh! It's all about nutrition!! Was one of my cheat days).



The author with her Northern supervisor during the author's visit to LSHTM

My London winter visit at London School of Hygiene & Tropical Medicine

Dr. Ruby Mcharo, THRiVE-2 PhD Fellow

One of the popular authors and speakers on religious matters, Joyce Meyer, once said “Patience is not simply the ability to wait - it is how we behave while we are waiting”, and surely it is not of any value to wait in vain. Similarly, is my journey towards, one, funding for a PhD, and second, funding for the research project to achieve one. I have always believed that everything, everything that happens, happens for a reason! Oblivious to what role THRiVE will come to play in my life, I took a decision to send in through my application on the verge of the application deadline. Little did I know that moment, that defining moment when I clicked “Send”, would later mean a solid commitment to the next four years of my life to achieving a dream I have patiently been waiting for.

Under THRiVE, my university of choice was Kilimanjaro Christian Medical University College (KCMUCo), and London School of Hygiene and Tropical Medicine (LSHTM) as a Northern

Institution. Some of my colleagues graduated or took some short courses LSHTM and I must say, I have always admired this institution and had aspired at some point in my career, to visit or attend a short course or even have a research project collaboration...and THRiVE opened wide these doors for me. I could not be more grateful!! The LSHTM is renowned for its research, postgraduate studies and continuing education in public and global health. I feel fortunate to be part of its community.

I arrived in London mid-January 2018 (Yes! I survived winter), to undertake modules offered by LSHTM which were important for my PhD research project. This visit was also useful for discussions on further details of the PhD project execution as I met face-to-face for the first time (after a number of emails and skype calls since early 2017) with my supervisor, Prof. Philippe Mayaud, an expert in Sexually Transmitted Infections (STIs) research in developed and

developing countries. As much as the weather was a challenge to get by during this time of year, the school environment was very warm, and welcoming with excellently equipped learning infrastructure.

As my background is mainly on clinical work and the project that I undertook has a lot of laboratory work, this visit made it possible for me to learn ‘hands-on’ on a number of STIs laboratory diagnostics in labs within the school under supervision of very committed and

competent staff. I got to visit various STI clinics such as the famous Dean Street express clinic along Soho Street...one word for this health facility- WOW! The clinic offers rapid, free and confidential STI screening and management, and is quite impressive (a possible idea I have carried with me for a similar twist in a developing country setting). My visit to LSHTM was worthwhile and I have applied most of the laboratory knowledge that I acquired there to conduct my PhD research.’





Research capacity building



Research Methods course



THRiVE through the eyes of the National Institute for Medical Research (NIMR), Tanzania

Dr. Gerry Mshana

Infrastructure development

- **Laboratories**
 - ➔ Refurbishment
 - ➔ Purchase of lab equipment
- **Support the LIMS**
 - ➔ Information Technology
 - ➔ Connect to NIMR/MITU to the national fibre optic backbone
 - ➔ Equipping a training facility
- **Training room**
- **Video conferencing equipment**

Information Communication Technology



Laboratories



- Bio-systems 3500 genetic analyser

- Connection to the national fibre optic network
- Improved Internet connectivity to support research & training

Research Environment

- Research grants manager recruited
- Support PhD fellows & recipients of CDAs to manage their projects & funds
- Facilitate joint grant applications
- Capacity building
 - ➔ Continued running the Mwanza RM course
 - ➔ 146 participants 2015-2020 (38 PhD fellows)
 - ➔ LSHTM started a similar course modelled on the Mwanza course
 - ➔ Support teaching & Masters & PhD at universities in Tanzania e.g. KCM College, CUHAS, University of Dodoma
 - ➔ Support fellows to publish their work

PhD Fellow



Dr. Denna Micheal Mkwashapi



Dr. Gerry Mshana
THRiVE Coordinator NIMR - Mwanza



Dr. John Chungalucha
Co-PI

Overcoming health difficulties to work towards attaining a PhD

Racheal Ninsiima, THRiVE Communications Officer

When Dr Denna Mkwashapi Michael became interested in seeking a fulfilling research career, he realized that a PhD would help him make that progression. He promptly responded to THRiVE's call for applications and was awarded the fellowship in July 2017. However, six months into his studies, he began to be plagued with debilitating headaches. A series of unfamiliar incidences followed – lack of concentration; high incidences of forgetfulness; memory loss, dizziness; aphasia (impaired ability to understand or produce a speech) and insomnia. He murkily recalls one devastating incident.

“One time, as I was travelling from Entebbe International Airport to Mwanza, I remember meeting several people who were directing me where to go and not to go. One of the people at the check-in points kept asking me whether I was drunk. I wasn't okay but I didn't know what was happening,” Dr Denna tearfully recalled.

The next thing he remembers is him waking up at Hilton Hotel in Nairobi with no memory of how he got there. He later transited to Mwanza and checked into the Imaging Centre to have an MRI scan. It was a shocking diagnosis, like thunder in a clear sky. He was diagnosed with a huge meningioma, a nearly half kilogram non-cancerous brain tumor. Although majority of meningiomas are benign, these tumors can grow slowly until they are very large and can be severely disabling and life-threatening.

“The tumor had grown so much so that it compressed some of the brain centers that are supposed to help you perform normally. My ability to write a report or a paper went down and this worried me a lot,” he remarked.

Shortly after diagnosis, he had surgery at Muhimbili Orthopedic Institute to remove the tumor. He spent nearly two months in the hospital and three weeks in intensive care. And for a year after his surgery, Denna was essentially housebound. Although his road to recovery has been tough, he is now back on track for his studies and work, thanks to his trusting mentor, Dr. John Changalucha, his fighting spirit and never-say-die attitude.

“Challenges are part of our lives. We need resilience to tackle the challenges. When I overcame this illness, I resolved to come back and work and to work with new energy,” Dr Denna strongly emphasized.



PhD Work



Dr. Denna's PhD research is exploring the effects of HIV infection and Antiretroviral Treatment (ART) use on fertility among women of reproductive age in Magu district, northwestern Tanzania between 1994 and

2018. This is because despite widespread availability of ART due to the universal test and treat policy, the impact of ART on fertility rates and fertility desires among Tanzanian women remains unknown.

His study is subdivided into three sub studies namely: HIV and women's fertility rates; HIV and women's fertility desires and HIV and Family Planning services. To obtain the trend in fertility, he analyzed data from a 26-year cohort study that used data from data from the Tanzania AIDS Monitoring Activity. The study included two community surveys namely: Health and Demographic

Surveillance System where birth, death and migration data is obtained from households and the HIV-Serological survey which shows the general trend in fertility, fertility trend by HIV status and level of fertility before and after ART initiation.

Preliminary findings indicate that there was a 42% fertility rate reduction for over 25 years of follow-up. Additionally, fertility level among HIV-infected women was lower than those who are not infected. However, as he continued to observe both groups, Denna discovered that the fertility gap between the two women groups

continued to narrow up to 2018 although they did not coincide. However, fertility levels among HIV infected women remained lower than those who are not infected. Furthermore, desire for fertility is gradually increasing although the actual fertility level was decreasing.

“These findings are needed by the Family Planning team at the district and national level to see what segment of the female population is most in need of family planning,” he said.

Although it has been a grueling journey for Dr. Denna, he has fought a good fight and is on the path to complete his PhD.



Mary Vincent Masha
 THRIVE-2 PhD Fellow

Prevention of childhood obesity through smart eating



Community & Public Engagement activities for PhD & PostDocs



Dr. Joel Bargul
 THRIVE-2 Postdoc Fellow

Engaging camel keepers to identify and prevent camel biting flies



Raising Zika virus awareness and its potential dangers among the public using secondary school students



**Assoc. Prof.
Angelina
Kakooza**
THRIVE-2
Postdoc Fellow



**Dr. Milugo
Trizah Koyi**
THRIVE-2 PhD
Fellow

Nurturing young
African Scientists to
conduct research in
Malaria



**Dr. Imelda
Namagembe**
THRIVE-2 PhD
Fellow

**Act now!
Save mothers and
babies**

A student-centred
approach to prevent
teenage pregnancy

**Dr. Susan
Atuhairwe**
THRIVE-2 PhD
Fellow

Spreading knowledge on Tuberculosis through Community and public engagement



Dr. Edward Wampande
THRIVE-2
Postdoc Fellow



Dr. Jonathan Mayito & Dr. Richard Kwizera
THRIVE-2 PhD
Fellow

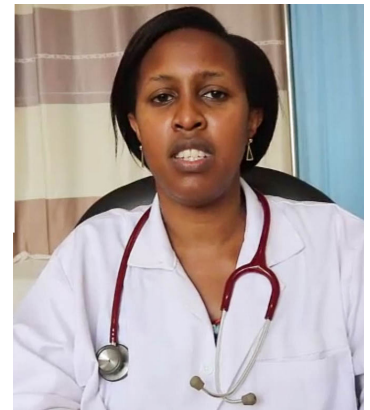


Preventing Tuberculosis and Asthma in communities using students' drama and comics



Trailblazers - THRiVE-2 Women in Science

By nurturing women in science, the Training Health Researchers into Vocational Excellence in East Africa (THRiVE) consortium has powerfully shown young women that Science Technology Engineering and Mathematics (STEM) is for them. These women scientists are now everywhere you look. Here is the groundswell of THRiVE-2 female scientists who are not only thriving in science but are also role models, inspiring and motivating the next generation of young women to follow their science dreams.



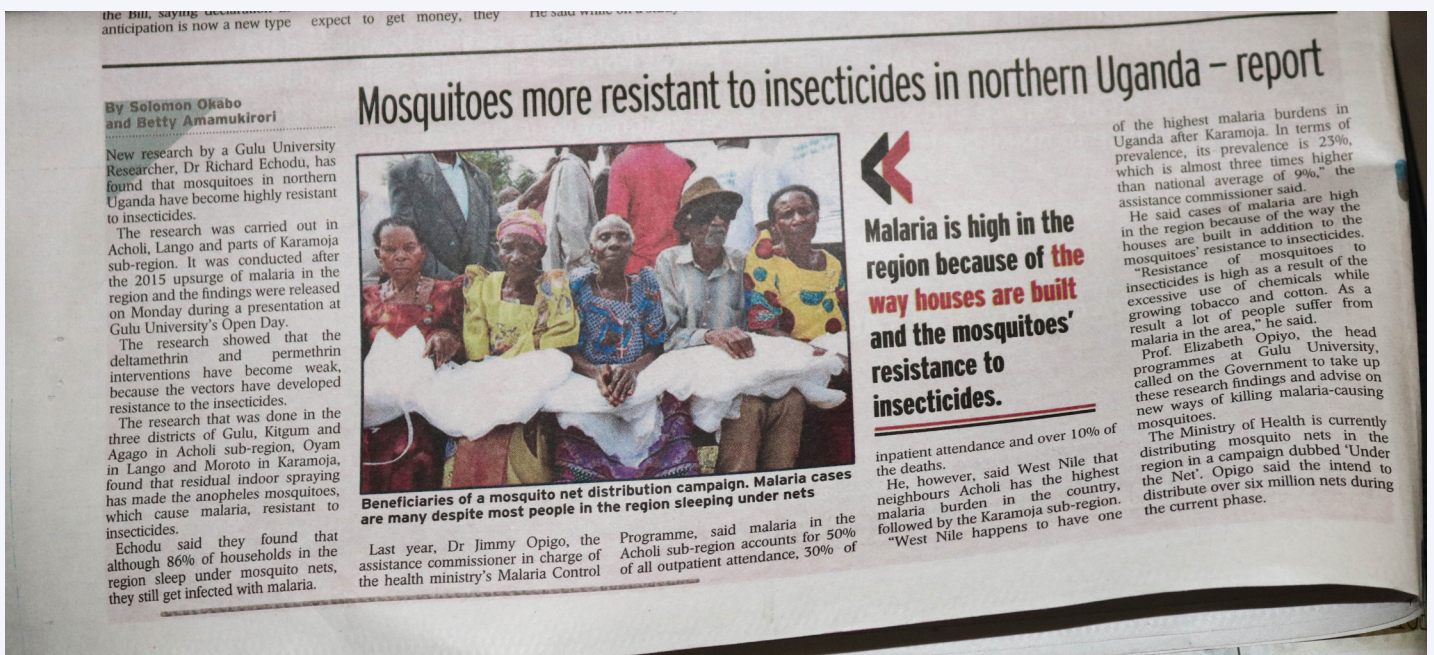


Media Articles / Video Productions for 2021

- 1) Accuracy of malaria testing kits worries scientist – Daily News, Tanzania <https://dailynews.co.tz/news/2021-01-21600976106c3aa.aspx>
- 2) Mosquitoes resistant to chemicals found in north <https://www.monitor.co.ug/uganda/news/national/mosquitoes-resistant-to-chemicals-found-in-north-3303772>
- 3) Makerere streamlines new healthcare management sciences in teaching program <https://www.ugstandard.com/makerere-streamlines-new-healthcare-management-sciences-in-teaching-program/>
- 4) Laboratory Scientists work round-the-clock to ramp up COVID-19 testing <https://www.ugstandard.com/laboratory-scientists-work-round-the-clock-to-ramp-up-covid-19-testing/>
- 5) The trouble with Tuberculosis <https://www.youtube.com/watch?v=zZ6eHQquSyQ>
- 6) World Kidney Day <https://www.youtube.com/watch?v=MGBZMtsxyyK>
- 7) World Tuberculosis Day https://www.youtube.com/watch?v=EKzHRs_H4r4
- 8) Using student centered approach to end teenage pregnancies <https://chimpreports.com/using-student-centered-approach-to-end-teenage-pregnancies/>
- 9) Students launch campaign to end teenage pregnancies <https://www.newvision.co.ug/articledetails/100009>
- 10) Social misconceptions increasing defiance towards COVID prevention measures-Study <https://chimpreports.com/social-misconceptions-increasing-defiance-towards-covid-prevention-measures-study/>
- 11) New study highlights challenges of communities' response towards Covid-19 mitigation measures <https://www.pmldaily.com/investigations/special-reports/2021/08/new-study-highlights-challenges-of-communities-response-towards-covid-19-mitigation-measures.html>
- 12) COVID-19: Community engagement essential in combating the pandemic (<https://www.newvision.co.ug/articledetails/111508>)
- 13) Repeat adolescent births worrying – study <https://www.observer.ug/news/headlines/71194-repeat-adolescent-births-worrying-study>
- 14) Take Note: How to deal with Epilepsy - <https://www.youtube.com/watch?v=O1DQtsEwiPM>
- 15) Making a world of difference by Dr. Peace Bagasha from Uganda (<https://www.internationaloutreach.ca/stories/making-a-world-of-difference-by-dr-peace-bagasha-from-uganda/>)

Media Articles for 2022

- 1) Gov't urged to do its own research on vaccinating children (<https://www.ntv.co.ug/ug/news/gov-t-urged-to-do-its-own-research-on-vaccinating-children-3811950>)
- 2) TAKE NOTE: How to deal with epilepsy (<https://www.youtube.com/watch?v=O1DQtsEwiPM>)
- 3) Gulu scientists develop waterbuck scented perfume to protect animals from tsetse flies <https://www.ugstandard.com/gulu-scientists-develop-waterbuck-scented-perfume-to-protect-animals-from-tsetse-flies/>
- 4) Ugandan doctor wins 2 billion shillings for research <https://www.studenthub.ug/news/335/ugandan-doctor-wins-2-billion-shillings-for-research>
- 5) Mechanical teaching methods to blame for poor performance – experts (<https://www.monitor.co.ug/uganda/news/national/mechanical-teaching-methods-to-blame-for-poor-performance-experts-3883424>)
- 6) Experts call for changes in teaching methods of science subjects (<https://www.youtube.com/watch?v=mtOzyA66Ytg>)
- 7) ENSASULA Y'ABASOMESA - Etandise okukosa eby'ensoma y'abayizi (<https://www.youtube.com/watch?v=FQpMXaOkjUw>)
- 8) Scientists Take Research to Schools (<https://ugandaradionetwork.net/story/scientists-take-research-to-schools-to-guarantee-community-use->)





Researcher studies how long it takes for HIV positive person to develop AIDS

Independent Report | February 26, 2021 | Health News | Leave a comment



THE CITIZEN ON SUNDAY
11 April 2021

Kilimanjaro sees steep rise in childhood obesity

By Zephania Uwani
@TheCitizenTZ
news@tz.nation.com.ki

Arusha. Childhood obesity is soaring high in Kilimanjaro region, to the alarm of some health experts.

Preliminary findings indicate the current prevalence of overweight and obesity to be as high as 15 percent.

That is an increase of eight percent compared to 2015, according to a recent study sponsored by Thrive, a health training facility in the East African region.

"This implies that childhood obesity is a growing trend in Kilimanjaro," said Dr Mary Moshia who led the study.

Incidentally, overweight problems among children have come alongside thinness, according to the research findings.

"Thinness among children implies the two forms of malnutrition exist in Kilimanjaro region, the other being obesity," the research findings obtained by *The Citizen* said in part.

According to her study, the prevalence of childhood obesity in Moshi municipal district by 2017 was eight percent.

Dr Moshia is a senior lecturer in the Community Health Department at Kilimanjaro Christian Medical University College (KCMC) in Moshi.

Childhood obesity is an emerging serious medical condition which puts children and adolescents at risk for poor health.

Experts say in recent years more and more children are being diagnosed with diabetes, high blood pressure and high cholesterol.

A study by the Department of Physical Education and Sports Science at the University of Dar es Salaam in 2016 indicated the prevalence of overweight in children to be 15.9 percent.

In her study in Kilimanjaro region, Dr Moshia involved children, mainly primary school kids, aged nine to eleven years.

"I examined various factors associated with overweight and obesity at different influence levels such as the home and school environments.

"I focused on those areas in order to understand what could be done if we wanted to develop an intervention," she said.

Ministry of Health, Community Development, Gender, the Elderly and Children officials have repeatedly said the magnitude of the obesity problem was not known.

This, according to them, was due to lack of data and socio-cultural beliefs which associate obesity and overweight with better nutritional status.

Obesity is a medical condition in which excess body fat has accumulated to an extent that it creates a negative effect on health.

It has individual, socio-economic, environmental, diet and can be tackled



MONITOR

Monitor@30 Elections Uganda@50 Project Success ... More

Breast cancer mortality to surpass cervical, says expert

Wednesday, October 07, 2020



THRIVE

HOME NEWS MEDIA SUPPLEMENTS TENDERS NOTICES E-PAPER JOBS HARVEST MONEY

NEWVISION

Sep 21, 2021 3 min Read

Repeated births among teenagers worrying

Amongst observed that many women wanted to delay the repeated birth but financial challenges rob them of their reproductive autonomy.

Using Student-Centered Approach to End Teenage Pregnancies

Ether Makula | April 26, 2021 | 1 minute read



NWSC Online

- Real time publications
- Press releases
- Videos
- Articles
- Blogs and other news related content.

Timely Information

Publications arising directly from THRiVE funding

1. **Joel L. Bargul, Denna M. Mkwashapi, Imelda Namagembe, Immaculate Nakityo**, Annettee Nakimuli, Josaphat Byamugisha, **Daniel Semakula, Janet Seeley, Nelson K. Sewankambo**. Case studies from the experience of early career researchers in East Africa in building community engagement in research. Accepted for publication Open research Africa in July, 2022.
2. **Imelda Namagembe**, Sarah Chukwuma, Annettee Nakimuli, Josephat Byamugisha, Ashley Moffett, Catherine Aiken. Learning from maternal death due to uterine rupture: review of cases from urban Uganda. *AJOB Global Reports* Volume 2, Issue 3, August 2022, 100063 <https://www.sciencedirect.com/journal/ajog-global-reports>
3. **Namagembe I**, Kiwanuka N, Byamugisha JK, Ononge S, Beyeza-Kashesya J, Kaye DK, Moffett A, Aiken CE, Nakimuli A. Why mothers die at a busy tertiary urban hospital in Kampala, Uganda: a comprehensive review of maternal deaths 2016-2018 and implications for quality improvement to reduce deaths. *Afri Health Sci.* 2022;22(2): 489-499. <https://dx.doi.org/10.4314/ahs.v22i2.57>
4. **Martin Mbonye**, Godfrey Siu, Janet Seeley. Marginal men, respectable masculinity and access to HIV services through intimate relationships with female sex workers in Kampala, Uganda. *Social Science and Medicine* March 22, Volume 296 114742
5. **Mary Vincent Masha**, Heavenlight A Paulo, **Sia E. Msuya**, Heiner Grosskurth, Suzanne Filteau (2022). Lack of an association between dietary patterns and adiposity among primary school children in Kilimanjaro Tanzania (*BMC Nutrition*) Lack of an association between dietary patterns and adiposity among primary school children in Kilimanjaro Tanzania. *BMC Nutrition* volume 8, Article number: 35 (2022)
6. **Bagasha**, Mhoira Leng, Elly Katabira, Mila Petrova. Cultural adaptation and face validation of the Kidney Disease Quality of life tool in Uganda: Accepted for publication: *African Journal of Nephrology*
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8. **Mziray SR**, Kumburu HH, Assey HB, Sonda TB, **Mahande MJ, Msuya SE, Kiwelu IE.** (2020). Patterns of acquired HIV-1 drug resistance mutations and predictors of virological failure in Moshi, Northern Tanzania. *PLoS ONE* 15(9): e0232649. <https://doi.org/10.1371/journal.pone.0232649>
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17. **Ruby Doryn Mcharo**, Abisai Kisinda, Lilian Njovu, Miri Mcharo, Florida Mbwilo, Getrude Mihale, Beatrice Komba, Ernest Andrew, **Philippe Mayaud**, Arne Kroidl, Olena Ivanova, **Sia Emmanuel Msuya**. Prevalence of and risk factors associated with HIV, Herpes Simplex Virus-type 2, Chlamydia trachomatis and Neisseria gonorrhoeae infections among 18-24 year old students attending Higher Learning Institutions in Mbeya-Tanzania. Accepted for publication in *PLOS One of Article thors*
18. **Arthur Kwizera**, David P. Kateete, Ronald Ssenyonga, Lydia Nakiyingi, Jane Nakibuuka, Christine Namata, Arthur Mwanje, **Emmy Okello**, Daphne Kabatoro, Noah Kiwanuka, Robert C. Bollinger, James Tumwine, Charlotte Summers. Acute Respiratory Distress Syndrome in an African Intensive Care Unit setting. A prospective study of prevalence and outcomes. Accepted for publication in *American Thoracic Society, Annals of the American Thoracic Society*
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20. **Susan Atuhairwe**, Josaphat Byamugisha, Othman Kakaire, Claudia Hanson, Amanda Cleeve, Marie Klingberg- Allvin, Nazarius Mbona Tumwesigye, Kristina Gemzell-Danielsson. Comparison of the effectiveness

and safety of treatment of incomplete second trimester abortion with misoprostol provided by midwives and physicians: a randomised, controlled, equivalence trial in Uganda *The Lancet Global Health* 2022, Pages e1505-e1513

21. **Robert D. Kaaya**, Johnson J. Matowo, Debora C. Kajeguka, Filemon F. Tenu, Boniface A. Shirima, Franklin W. Moshia and Reginald A. Kavishe. The Impact of Submicroscopic Parasitemia on Malaria Rapid Diagnosis in Northeastern Tanzania, an Area with Diverse Transmission Patterns. Accepted for publication in *Infectious Diseases Report*
22. **Martin Mbonye**, Godfrey Siu and **Janet Seeley**. The meaning of fatherhood to men in relationships with female sex workers in Kampala, Uganda: the struggle to model the traditional parameters of fatherhood and masculinity. Accepted for publication in *PLOS One*.
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