

NATIONAL INSTITUTE FOR MEDICAL RESEARCH



ANNUAL REPORT

JULY 2017-JUNE 2018

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National Institute for Medical Research
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FROM THE DIRECTOR GENERAL



The 2017/18 Annual report demonstrates NIMR's continued attainment of fulfilling its dual mandates to conduct and regulate health research. The institute has grown in terms of research activities carried out and a significant increase in the number of partnerships as stated in the report.

Despite the tight economic international environment NIMR continues to make significant contributions to communicable disease research. NIMR carried out 93 research projects during the reported year with the majority in HIV (24%), TB (15%), Malaria (12%) and Zoonoses/one health (9.7%). Nineteen (19) impact evaluations, baseline and sero-surveys were carried out. Most of the surveys were to support vertical programmes in progress monitoring. The institute intends to strengthen capacity in non-communicable disease research in the coming financial year. The national capacity for health research has increased as evidenced in the number of new ethical clearance applications during the reported year totalling 281.

The institute continues to provide scientific evidence that translates into practice. This is evident in HIV studies that provided evidence that led to changes in the WHO management of Cryptococcal diseases in HIV infected persons and national HIV diagnosis & treatment guidelines and further evidence led to the drafting of the national alcohol control policy at MOHCDGEC. Contribution to research is also evidenced in the 96 publications from NIMR Scientists.

During the reporting period the institute through support from the Government of Tanzania has continued to invest in Tanzania's natural products. The construction of a production plant is well underway to commercialize products developed through R&D at the institute.

Reflections on the year 2017/18 take note of the challenges faced with the absence of a Council during the reporting period which may have led to various management and operational challenges.

I would like to thank the Government of Tanzania through its relevant Ministries and institutes/agencies and the people of Tanzania for enabling us to carry out research studies to improve the wellbeing of our people. I sincerely thank NIMR staff for the efforts and dedications that continue to promote the name of NIMR.

Lastly, we could not have carried out this work without our collaborators, funders and development partners who contribute to make it possible to achieve our motto of "advancing health research, enhancing lives".

A handwritten signature in blue ink, appearing to read 'Yunus D. Mgaya', with a long horizontal stroke extending to the right.

Prof Yunus D. Mgaya
Director General

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1.0 ABOUT THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH

The National Institute for Medical Research (NIMR) is a parastatal institution established by the Act of Parliament in October 1979 with the following mandate:

- i) To carry out and promote the carrying out of health research, including traditional medical practices designed to alleviate disease among the people of Tanzania;
- ii) To carry out, and promote the carrying out of, medical research into various aspects of local traditional medical practices for the purpose of facilitating the development and application of herbal medicine;
- iii) In co-operation with the Government or any other person or body of persons, to promote, or provide facilities for, the training of local personnel for carrying out scientific research into medical problems;
- iv) To monitor, control and co-ordinate medical research carried out within Tanzania, or elsewhere, on behalf of or for the benefit of the Government of Tanzania, and to evaluate the findings of that research;
- v) To establish a system of the registration of, and to register, the findings of medical research carried out within Tanzania, and promote the practical application of those findings for the purposes of improving or advancing the health and general welfare of the people of Tanzania;
- vi) To establish and operate systems of documentation and dissemination of information on any aspect of the medical research carried out by or on behalf of the institute;
- vii) Carry out, and promote the carrying out of, research and investigation into the causes and the ways of controlling and preventing the occurrence in Tanzania of particular diseases or a category of them.
- viii) In co-operation with the Government or any person or body of persons, carry out and promote the carrying out of, basic, applied and operational research designated to provide effective measures for the control of diseases endemic in Tanzania

Vision: *To be an institution of excellence for advancement of health research and development in Tanzania and beyond*

Mission: *To conduct, coordinate, regulate and promote scientifically and ethically sound, high quality health research and deliver evidence-based information that is responsive to the needs of human wellbeing*

The NIMR Act directs every person engaged or intending to engage, in medical research within Tanzania shall, at his own expense furnish to the Institute information relating to that research and shall make available to the Institute copies of any relevant records or findings in such form and within such periods as may be prescribed.

Research Centres and Attached Stations	Areas of Research Specialization
Amani, Gonja & Handeni	Vector Biology, Ecology and Control of Vector Borne Diseases (Malaria, Lymphatic Filariasis, Onchocerciasis, Tick-Borne Relapsing Fever etc.), Evaluations of Novel Vector Control Tools, Health Systems and Policy Research
Mwanza & Tabora	Schistosomiasis and STH, HIV/AIDS, Reproductive Health, STIs, Human African Trypanosomiasis
Muhimbili, Kilosa & Haydom	Tuberculosis, HIV, Maternal and Child health, Non-Communicable Diseases, Zoonoses
Tanga & Korogwe	Basic biomedical research and Clinical Trials of Infectious Diseases (Malaria, HIV, Neglected Tropical Diseases) and Non-communicable diseases (Sickle cell disease).
Mbeya & Tukuyu	HIV/AIDS, Tuberculosis, Non-Communicable Diseases, Neglected Tropical Diseases, Maternal and Child health
Ngongongare (Arusha)	Ethno-botanical Studies/Traditional Medicine
Dodoma	Non-communicable diseases, biomedical research, clinical research

NIMR Dar es Salaam hosts research coordinating and regulatory departments to include:

- Monitoring & Evaluation
- Disease Surveillance and Geographical Information Systems
- Policy Analysis and Advocacy
- Health Systems Research
- National Health Research Ethics Review Sub-Committee (NatHREC)
- Traditional Medicine Research

Laboratory Capacity

NIMR has laboratories ranging from Biosafety Level (BSL) 1 to 4 for biomedical sciences in Korogwe, Tanga, Mwanza, Amani, Muhimbili, Mbeya, Dodoma and Tabora. Entomology laboratory facilities are available at Amani, Mwanza and Tukuyu.

Other facilities for research and services include dispensaries, experimental huts, mosquito spheres, animal houses, insectaries, libraries and training facilities.

2.0 INSTITUTION MANAGEMENT

	Name	Position
1.	Prof Yunus D. Mgya	Director General
2.	Dr Paul E. Kazyoba	Ag. Director, Research Coordination & Promotion
3.	Dr Ndekya M. Oriyo	Ag. Director, Information Technology & Communication
4.	Mr Obedi S. Ole-Kaondo	Director, Finance, Human Resource & Planning
5.	Dr William Kisinza	Director, Amani Research Centre
6.	Prof John P. Lusingu	Ag. Director, Tanga Research Centre
7.	Dr Safari Kinung'hi	Ag. Director, Mwanza Research Centre
8.	Prof Sayoki G. Mfinanga	Director, Muhimbili Research Centre
9.	Dr Nyanda E. Ntinginya	Ag. Director, Mbeya Research Centre
10.	Ms Bupe L. Ndelwa	Human Resource Manager
11.	Mr Thomas Massanja	Ag Chief Accountant
12.	Mr John Msangi	Ag Chief Internal Auditor

3.0 FINANCIAL MANAGEMENT AND RESOURCE MOBILIZATION

3.1 REPORT OF THE CONTROLLER AND AUDITOR GENERAL

REPORT OF THE CONTROLLER AND AUDITOR GENERAL ON THE FINANCIAL STATEMENTS OF NATIONAL INSTITUTE FOR MEDICAL RESEARCH FOR THE YEAR ENDED 30TH JUNE, 2017

Introduction:

I have audited the accompanying financial statements of the National Institute for Medical Research which comprise of the Statement of Financial Position as at 30th June, 2017, Statement of Financial Performance, Cash Flow Statement, Statement of Changes in Net Assets/Equity, and the Statement of Comparison of Budget and Actual Amounts for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies set out from pages 23 to 48.

Opinion

In my opinion, the accompanying financial statements of the National Institute for Medical Research present fairly in all material respects, the financial position of the the Institute as at 30th June, 2017, financial performance and its cash flows, for the year then ended, in accordance with International Public Sector Accounting Standards (IPSAS) Accrual basis of accounting.

Basis of Opinion:

I conducted my audit in accordance with International Standards of Supreme Audit Institutions (ISSAIs). My responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the financial statements section of my report. I am independent of National Institute for Medical Research(NIMR) in accordance with the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants (IESBA Code) together with the National Board of Accountants and Auditors (NBAA) Code of Ethics, and I have fulfilled my other ethical responsibilities in accordance with these requirements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Information Other than the Financial Statements and Auditors' Report Thereon

Management is responsible for other information. The other information comprises of the Governing Council's Report and Declaration by the Head of Finance but does not include the Financial Statements and my Auditor's Report thereon.

My opinion on the financial statements does not cover the other information and I do not express any form of assurance conclusion thereon. In connection with my audit of the financial statements, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or my knowledge obtained in the audit, or otherwise appears to be materially misstated.

If, based on the work I have performed on the other information that there is a material misstatement of this other information; I am required to report that fact. I have nothing to report in this regard.

Key Audit Matters

Key audit matters are those matters that, in my professional judgement, were of most significance in my audit of the financial statements of the the current period. I have determined that there are no key audit matters to communicate in my report.

Responsibility of Management and Those Charged with Governance for Financial Statements:

Management is responsible for the preparation and fair presentation of the financial statements in accordance with the International Public Sector Accounting Standards (IPSAS), and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Institute's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Institute or cease its operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Institute's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

My objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

In addition, Sect. 10 (2) of the the PPA No. 11 Of 2008 requires me to satisfy myself that, the accounts have been prepared in accordance with the appropriate accounting standards.

Further, Sect. 48 (3) of the Public Procurement Act No. 7 of 2011 requires me to state in my annual audit report whether or not the audited entity has complied with the provisions of the law and its Regulations.

Report on Other Legal and Regulatory Requirements

Compliance with the Public Procurement Act, 2011

In view of my responsibility on the procurement legislation, and taking into consideration the procurement transactions and processes I reviewed as part of this audit, I state that National Institute for Medical Research procurement transactions and processes have generally complied with the Public Procurement Act No 7 of 2011 and its related Regulations of 2013.

The engagement partner on the audit resulting in this independent auditor's report is the Contoller and Auditor General.


Prof. Mussa Juma Assad
Controller and Auditor General

National Audit Office,
Dar es Salaam, Tanzania

8th February, 2019




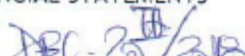
3.2 FINANCIAL STATEMENTS

STATEMENT OF FINANCIAL POSITION AS AT 30TH JUNE, 2017

	NOTE	30.06.2017 TZS	30.06.2016 TZS
ASSETS			
Current Assets			
Cash and cash equivalents	2	7,756,670,069	6,775,438,875
Receivables, deposits & prepayments	3	1,883,004,142	1,941,669,230
Inventories	4	421,160,303	357,290,620
Total Current Assets		10,060,834,514	9,074,398,725
Non current assets			
Productive livestock	5	3,553,000	4,481,000
Work in Progress	6	1,768,803,987	1,823,717,450
Property, Plant and Equipment	6	1,207,346,510	1,210,690,106
Land and Buildings	6	11,530,706,814	11,605,765,805
Total Non Current Assets		14,510,410,311	14,644,654,361
Total Assets		24,571,244,825	23,719,053,086
Liabilities			
Current Liabilities			
Payable and Accrued charge	7	2,704,962,961	3,126,757,915
Total Current Liabilities		2,704,962,961	3,126,757,915
Non Current Liabilities			
Research and development grants	8	4,545,583,496	6,366,270,887
Capital Grants	9	1,412,916,845	1,321,605,235
Total Non Current Liabilities		5,958,500,341	7,687,876,122
TOTAL LIABILITIES		8,663,463,302	10,814,634,037
NET ASSETS		15,907,781,523	12,904,419,049
EQUITY			
Capital and Reserves			
Capital Fund	10	14,337,782,272	14,337,782,272
Fixed Assets Revaluation reserve		3,567,651,516	3,567,651,516
Accumulated Surplus/(Deficit)		(1,997,652,260)	(5,001,014,739)
TOTAL EQUITY		15,907,781,528	12,904,419,049

NOTES 1 TO 21 FORM PART OF THESE FINANCIAL STATEMENTS


CHAIRMAN


DATE


MEMBER

NATIONAL INSTITUTE FOR MEDICAL RESEARCH

STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 30TH JUNE 2017

	NOTES	2016/2017 TZS	2015/2016 TZS
REVENUE			
Government Grants - Personal Emoluments		9,669,903,540	10,166,146,841
Government Grants - Other Charges		122,503,900	195,516,458
Government Grants - Development		800,000,000	-
Consultancy activities revenue	11	478,350,384	336,098,968
Other Revenue	12	7,534,424,266	5,783,642,259
Amortization of capital grants	9	103,837,420	69,499,778
TOTAL REVENUE		<u>18,709,019,509</u>	<u>16,550,904,304</u>
EXPENSES			
Staff salaries and allowances	13	13,269,087,492	13,014,938,731
Administrative expenses	14	1,982,277,809	1,680,059,059
Committee and council meeting expenses		-	107,072,680
Repairs and maintenance	15	243,045,212	212,178,697
Other expenses	16	570,653,722	774,231,113
Consultancy activities expenses	17	354,782,491	233,826,545
Audit Fees		63,608,490	71,551,000
Depreciation		553,350,437	584,401,943
TOTAL EXPENSES		<u>17,036,805,654</u>	<u>16,678,259,768</u>
Suplus/(Deficit) for the period		1,672,213,855	(127,355,464)
Prior Year Adjustments	18	1,329,277,126	516,278,506
Accumulated Surplus/(Deficit) brought forward		<u>(4,999,143,241)</u>	<u>(5,388,066,283)</u>
Accumulated Surplus/(Deficit) carried forward		<u>(1,997,652,260)</u>	<u>(4,999,143,241)</u>

NOTES 1 TO 21 FORM PART OF THESE FINANCIAL STATEMENTS


 CHAIRMAN


 DATE


 MEMBER

NATIONAL INSTITUTE FOR MEDICAL RESEARCH
STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30TH JUNE, 2017

	2016/2017 TZS	2015/2016 TZS
CASH FLOWS FROM OPERATING ACTIVITIES		
Surplus/(Deficit) for the year	1,672,213,855	(127,355,464)
Adjustment for non cash items:		
Depreciation	553,350,437	584,401,943
Capital Grants Adjustment	(1,871,497)	
Prior Year Adjustment	1,329,277,122	514,407,008
Amortization of capital grants	<u>(103,837,420)</u>	<u>(69,499,778)</u>
Surplus/(Deficit) before changes in working capital items	3,449,132,497	901,953,709
(Increase)/Decrease in inventories	(63,869,683)	(287,834,810)
(Increase)/Decrease in receivables, deposits & prepayments	58,665,088	(41,468,769)
Increase/(Decrease) in payables and accrued charges	<u>(421,794,954)</u>	<u>499,110,610</u>
Total Cash flows from operating activities (A)	<u>3,022,132,948</u>	<u>1,071,760,740</u>
CASH FLOWS FROM INVESTING ACTIVITIES		
Acquisition of Property, Plant and Equipment	(418,162,890)	(580,545,178)
Disposal of Property, Plant and Equipment	-	
Acquisition of Livestock		
Disposal of Livestock	<u>928,000</u>	<u>2,250,000</u>
Net Cash flows from investing activities (B)	<u>(417,234,890)</u>	<u>(578,295,178)</u>
CASH FLOWS FROM FINANCING ACTIVITIES		
Capital Fund		
Increase/(Decrease) in Research and development grant	(1,820,687,391)	3,414,118,556
Capital grants received	<u>197,020,527</u>	<u>620,141,512</u>
Net Cash flows from financing activities (C)	<u>(1,623,666,864)</u>	<u>4,034,260,068</u>
Increase/(Decrease) In Cash And Cash Equivalent (A+B+C)	981,231,194	4,527,725,630
Cash and cash equivalent at the beginning of the period	<u>6,775,438,875</u>	<u>2,247,713,245</u>
Cash and cash equivalent at the end of the period	<u>7,756,670,069</u>	<u>6,775,438,875</u>

NOTES 1 TO 21 FORM PART OF THESE FINANCIAL STATEMENTS


CHAIRMAN


DATE


MEMBER

3.3 COMMERCIALIZATION OF RESEARCH PRODUCTS

NIMR is in process of commercializing herbal products for health. Dossiers of seven herbal drugs have been revised and samples of medicines are being produced ready for resubmission to the Tanzania Food and Drug Authority (TFDA) for registration. After registration, herbal drugs will be promoted and commercialized as over-the-counter prescriptions. The submitted dossiers are:

- xii. Tms 2001 – herbal treatment for malaria
- xiii. Hepacure – herbal treatment for liver disorders
- xiv. Persican – herbal treatment for diabetes and cholesterol
- xv. Persivin – herbal treatment for benign prostate hypertrophy
- xvi. Nimrevit – herbal drink
- xvii. Warburgistat – herbal treatment for opportunistic infections
- xviii. Usambara balm – herbal management for cold and flu

4.0 HUMAN RESOURCE CAPACITY

List of NIMR Staff on Training

During the period under review the following staff continued with training at various academic Institutions as it is detailed here in below: -

S/N	NAME	LEVEL OF TRAINING	SPECIALIZATION	UNIVERSITY
1.	Dunstan Matungwa	PhD	Anthropology	Rutgers, USA
2.	Mrs. Zaina Mchome	PhD	Child Nutrition	Groningen University- Netherlands
3.	John Marijani	MSc	Procurement & Supply Chain Management	Mzumbe University
4.	Bazil Baltazar Kavishe	PhD	Diabetes and associated complications in HIV Patients	CUHAS & University of Copenhagen-Denmark
5.	Mussa Nsanya	MSc	Clinical Epidemiology and Health Services Research	Cornell Medical College - New York
6.	Denna Michael	PhD	HIV	KCMUCo & LSHTM
7.	Grace Asukenye	Diploma	Diploma in Human Resource Management	Mount Meru University- Mwanza
	Marco Missanga	MSc	Internal Medicine	University of Dodoma
	Bariki Mtafya	PhD	Medicine	St Andrews University, Scotland,
	Lwitiho Sudi	MSc	Laboratory Sciences	University of Nelson Mandela, Arusha
	Ruby Mcharo	PhD	Public Health	KCMUCo/LSTHM
	Wilbert Mbuya	PhD	Laboratory Sciences	Ludwig Munich University, Germany
	Issa Sabi	PhD	International Health	LMU
	Rose Bruno	Diploma	Lab science	RUCO
	Ombeni Chimbe	MSc	Public Health	South Wales
	Dr. Seth Misago	PhD	Life Science and Bioengineering	Nelson Mandela African Institute of Science and Technology, Arusha, Tanzania.
	Mr. Vito Baraka	PhD	Medical Sciences	University of Antwerp, Belgium
	Dr. Celine Mandara	PhD	Malaria	KCMUCo, Moshi, Tanzania
	Dr. Omari Abdul Msemu	PhD	Epidemiology	KCMUCo Moshi
	Mr. Deogratias Maiga	PhD	Nano Technology	University of Johannesburg, South Africa

	Mr. Filbert Francis	PhD	Medical Sciences	Karolinska University Sweden.
	Mr. Rashid Madebe	MSc	Microbiology, Immunology & Molecular Biology	Kilimanjaro Christian Medical University College (KCMUCo)
	Mr. Paul Martine	MSc	MSc. Parasitology	Sokoine University of Agriculture, Morogoro, Tanzania.
	Ms. Joyce Mbwana	MSc	MSc. Molecular Biology	University of Dar es Salaam, Tanzania.
	Ms. Charity Msangi	Certificate	Human Resource	TPSC Tanga campus.
	Mr. Francis Chambo	Diploma	Diploma in Records Management at TPSC Tanga campus.	TPSC Tanga campus
	Mr. Victor Mwingira	PhD	RThesis titled: Identification of oviposition semi chemicals and exploitation of their potentials in surveillance and control of primary malaria vectors in Tanzania,	Wageningen University, the Netherlands.
	Dr. Patrick Tungu	PhD	Thesis titled: Evaluation of insecticide treated materials used for mosquito vector control, registered at the	London School of Hygiene and Tropical Medicine
	Dr. Veneranda Bwana	PhD	Intra – ACP Academic mobility, registered at	UNZA, Zambia.
	Dr. Dennis J. Masue	PhD	Thesis: The useful life of Bed net for Malaria Control in Tanzania: Attrition, Bio efficacy, Chemistry Durability and Insecticide Resistance”	University of Basel, Switzerland.
	Dr Yahya Athumani Derua	PhD	Thesis: “Evaluation of long lasting microbial larvicides in reducing malaria transmission”; registered at	Kilimanjaro Christian Medical University College (KCMUCo)
	Ms. Sadakati Omary	BSc	Bachelor of Social Science at	University of Dodoma

Retired Officers

The following table shows names of retired officers for the period under review:

NAMES	OCCUPATION	STATION	REASONS	DATE
Mr. John Chungalucha	Centre Director	Mwanza	Retired	1/6/2018
Mr. Samwel Ndokeji	Research Scientist I	Mwanza	Retired	1/6/2018
Mr. Gaya Gunda Wandore	Assistant Accountant II	Mwanza	Retired	1/6/2018

5.0 HEALTH RESEARCH REGULATION

The Medical Research Coordinating Committee (MRCC) is the national health research coordinating body that ensures all health research follows country's ethics requirements. The MRCC has delegated functions of registering, ethical review, approving and monitoring of research to the National Health Research Ethics Review Sub-Committee (NathREC), which is hosted at NIMR Headquarters. NathREC is responsible for overseeing all issues pertaining to health research data and material transfers.

During the reporting period NathREC held the following meetings:

1. NathREC 97th meeting held on 03rd July 2017 at NIMR-HQ
2. NathREC 98th meeting held on 04th August 2017 at NIMR-HQ
3. NathREC 100th meeting held on 21st September 2017 at NIMR-HQ
4. Clinical trials subcommittee 31st meeting 25th July 2017, at NIMR-HQ
5. NathREC 101st meeting held on 18th October 2017 at NIMR-HQ
6. NathREC 102nd meeting held on 05th December 2017 at NIMR-HQ
7. Clinical trial subcommittee 33nd meeting held on 06th October 2017 at NIMR-HQ
8. Clinical trials subcommittee 34th meeting held on 08th November 2017, at NIMR-HQ
9. Clinical trials subcommittee 35th meeting held on 22nd December 2017, at NIMR-HQ
10. NathREC 103rd meeting held on 18th January 2018 at NIMR-HQ
11. NathREC 104th meeting held on 15th February 2018 at NIMR-HQ
12. NathREC 105th meeting held on 28th March 2018 at NIMR-HQ
13. NathREC 106th meeting held on 27th April 2018 at NIMR-HQ
14. NathREC 107th meeting held on 24th May 2018 at NIMR-HQ
15. NathREC 108th meeting held on 28th June 2018 at NIMR-HQ
16. Ad-Hoc Meeting on Serious Adverse Events held on 10th April 2018 at NIMR- HQ
17. Ad-Hoc Meeting on Serious Adverse Events held on 8th June 2018 at NIMR- HQ

NathREC has delegated functions for ethical clearance to zonal ethics committees including the Mbeya Medical Research and Ethics Committee held five (5) meetings on 26th September 2017, 12th December 2017, 11th January 2018, 20th March 2018, and 15th May 2018.

During the period, NathREC Secretariat received a total of 357 proposals being 281 new research proposals and 76 amendment applications (**Appendix 1**).

Permission to publish is a condition of ethical clearance to monitor ethical clearance adherence and research output. Investigators must apply for permission to publish health-related research conducted in Tanzania. Thirty-six (36) were manuscripts granted permission to publish during the quarter (**Appendix 2**).

6.0 HEALTH RESEARCH CARRIED OUT

6.1 HUMAN IMMUNODEFICIENCY VIRUS (HIV)

Determination of factors associated with HIV infection among children with less than five years in Muheza District, Tanzania - NIMR Amani

Early infant diagnosis (EID) services have been integrated in prevention of mother to child transmission (PMTCT) facilities in sub Saharan Africa. The WHO recommendation is for at least 80% of all HIV exposed infants to receive HIV test within the first two months of life. However, the coverage is still low. Objectives: The study aims to: (1) determine factors associated with accessibility of early HIV diagnosis among under five children; (2) determine socio-demographic characteristics associated with HIV infection among under five children; (3) assess availability and performance of early infant diagnosis (EID) services; (4) assess knowledge, attitudes and perceptions of mothers/care takers of under-fives and health service providers regarding EID services; and (5) determine the prevalence of HIV among under five children. Methodology: This study employs concurrent mixed methods comprising of cross-sectional survey, health facility survey and case study design. Study population comprises of health care workers and HIV positive mothers/care takers with their HIV exposed under five children.

Informal Use of Mobile Phones in Accessing HIV and AIDS Services in Agro-pastoralist and Pastoralist Communities in Tanzania - NIMR Amani

The changing of the social cultural fabric among pastoralists and the increasing interaction with other populations for the sake of raising income has made pastoral communities to be exposed to the same risks of HIV and AIDS as experienced by the general population. The mobility of pastoralists has posed challenges in utilization of HIV and AIDS services due to limited uptake and adherence. The use of mobile phones to enhance uptake and adherence is among appropriate approaches to improve the link between health care providers and service recipients. The objective of the study was to assess acceptability and effects using cellular mobile phones to enhance uptake and adherence to CTC, VCT and PMTCT services by linking the health service providers and clients in selected Maasai communities in Tanzania.

Tackling the Structural Drivers of the HIV Epidemic (STRIVE) -NIMR Mwanza

Undertake rigorous research into what works to tackle the structural determinants of HIV and maximize learning from interventions that have effectively influenced policy. STRIVE works on four, interlocking structural drivers: (1) *Gender roles and inequalities* that are culturally and institutionally reinforced and structure men's and women's sexual behaviour, economic opportunities, power and vulnerability to violence, and that undermine their efforts to avoid HIV; (2) *Stigmatisation, discrimination and criminalisation* that prevents people from HIV testing and hinders the efforts of marginalized or disempowered groups such as sex workers to avoid HIV and/or access services; (3) *Poor livelihood opportunities* and the associated population movements, which help shape patterns of sexual mixing, deplete hope, self-efficacy and trust, which can foster risky behaviour, and hinder HIV prevention and treatment efforts; and (4) *Unrestricted alcohol availability and drinking norms* that influence HIV risk and exacerbate sexual risk-taking and gender-based violence. The STRIVE team in Tanzania has worked with the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) to address issues of alcohol use in national policies. Specifically, the team has provided input in various drafts of the revised National Health Policy (of 2018) to highlight how alcohol use contributes to the disease burden in the country and how it should be addressed in the policy.

Research to Inform HIV Prevention Interventions among Key Populations in Tanzania (SAUTI) - NIMR Mwanza

Objectives are to design and evaluate various interventions for HIV prevention among key populations in Tanzania and to conduct operations research to inform the delivery of these interventions. Several sub studies are carried out under this project. One of the sub-studies was the Vulnerable Adolescent Girls and Young Women (VAGYW) Cash Transfer Trial (Care Study): The study is a two-arms cluster randomised controlled trial implemented in 2,730 Adolescent Girls and Young Women (AGYW) aged 15-23 years in three districts in Shinyanga region (Kahama, Ushetu and Msalala). The participants are followed up for 18 months and are randomised to either receive a quarterly cash transfer payment through their mobile phones (unconditional cash transfer) or not receiving any payments (control arm). The baseline data collection was completed, and analysis of the data was done. Data collection for the second round of the survey commenced and is on-going.

Monitoring access to HIV services in Kisesa ward, Tanzania through real time record linkage (Mesh study) – NIMR Mwanza

The main aim is to measure the determinants of successful (and unsuccessful) utilization and navigation of HIV services in Kisesa ward at a population level so that modifiable mediators of service uptake may be effectively targeted by interventions to improve engagement in HIV care. Real-time record linkage is the extension of the probabilistic record linkage that involves a brief interview with consented individuals to ultimately obtain a true match between health facility and community cohort data. As there are no identifiers that uniquely link health facility records to the community data in Kisesa, personal identifying attributes that are common to both datasets (e.g. name, sex, date of birth, residence information) have to be used to match records. Similar to probabilistic methods, this personal information is input into a software application that automatically calculates matching weights and returns likely matches to the data clerk/interviewer. Then, through the brief interview, the data clerk can search through the returned potential matches and ask the consented individual in “real-time” some further questions, such as other household member names, in order to locate the true match. Once a true match is located, the data clerk saves the match in the software application window, which outputs the unique numerical DSS identifier along with the respective clinic identifier (e.g. HTC, ANC, CTC) directly into an encrypted database, and the entered data gets automatically erased from the software application’s fields. This means that the personal information will only be visible to the specially trained data entry personnel (data entry clerks and data managers supervising them) at the time the data are entered.

Innovating for Adolescents Easier Access to HIV testing in Tanzania – NIMR Mwanza

Objectives are to (1) To design solutions to support HIV testing and linkage to care services for the key populations of adolescents and young adults in Tanzania (2) To increase uptake of vulnerable adolescents and young adult populations’ engagement with HIV testing and care and (3) To understand the target group’s preferences, fears and motivations for HIV testing.

Diabetes and Associated Complications in HIV Patients (CICADA study) -NIMR Mwanza

The Development objectives of this study are to contribute to prevention of diabetes mellitus (DM) and associated complications as well as to better management of DM among HIV+ individuals in sub-Saharan Africa and to strengthen research capacity on the link between HIV and chronic diseases including DM, to enhance translation of research findings into clinical practice and health research sustainability in Tanzania.

Community-based HIV Treatment Service Delivery Model on Linkages to and Retention in HIV Care among Female Sex Workers in Tanzania – NIMR Mwanza

The goal of this implementation science research study is to pilot and evaluate the impact of community-based model of ART delivery, whereby HIV care and ART provision will be provided by clinicians at non-mainstream HIV prevention sites, i.e., DIC and CBHTC. A Baseline and Midline and Endline survey has been conducted in Mbeya region as the control arm and Njombe region as the Intervention arm.

Intermittent High Dose AMBISOME® on a High Dose Fluconazole Backbone for Cryptococcal Meningitis Induction Therapy in sub-Saharan Africa: An Adaptive Randomised Controlled Non-inferiority Trial - NIMR Mwanza

Primary Objective: To determine the EFA of alternative schedules of intermittent high dose Ambisome in comparison with standard daily Ambisome, all given with fluconazole at 1200 mg/d for the first 2 weeks, in induction therapy for HIV-associated cryptococcal meningitis. Secondary Objectives: (1) To determine the PK parameters and PK/PD associations of alternative schedules of intermittent high dose Ambisome, (2) To gather data on the clinical efficacy and safety of these alternative schedules of intermittent high dose Ambisome in induction therapy for HIV-associated cryptococcal meningitis and; (3) To model the cost-effectiveness of these alternative schedules of intermittent high dose Ambisome in induction therapy for HIV-associated cryptococcal meningitis.

Diabetes and associated complications in HIV patients (CICADA study) - NIMR Mwanza

The emerging data from high-income countries suggest that HIV and ART may increase the risk of Diabetes Mellitus (DM). However, there is limited data on these links in SSA; lack of these data prevents efforts to improve DM care in HIV programmes in SSA. The study aims to study the link between HIV, ART and other risk factors on pre-DM and DM and associated complications and explore if these links are explained by inflammation, dyslipidaemia, and excessive adiposity in HIV patients. Recruit participants from two existing HIV cohorts recruited between 2006-2011, and recruit new smaller HIV cohort, all with a total of 640 HIV+, 1035 HIV-, and 670 HIV+ on ART participants to study these associations and explore if such associations are explained by chronic inflammation, dyslipidaemia, and ART-associated changes in body composition. At baseline and end of one and two years, data on pre-DM and DM and risk factors and complications will be collected. Blood samples are collected for glucose testing, assessment of inflammatory markers and kidney functions. In addition, body composition is measured using anthropometry and bioelectrical impedance analyser. Data collected at beginning of the two existing cohorts as well as in the two years follow-up will be used to address study objectives. Multiple regression analysis models will be used to control for multiple confounding. Data generated on the links between HIV and ART and DM in SSA will be used by the Ministry of Health to optimize prevention and clinical care of DM in HIV patients. The project has both human and infrastructure capacity building. To strengthen human research capacity, two PhD students have been enrolled.

Translating Research into Practice (TRIP): Evaluating and Speeding up the adoption of an evidenced based innovative REMSTART package to reduce mortality in advanced stage HIV patients starting antiretroviral therapy in Tanzania - NIMR Muhimbili

The previously conducted REMSTART trial showed that Cryptococcal Antigen (CrAg) Screening and pre-emptive treatment with fluconazole combined with a short period of home support for 4 weeks reduces mortality by about 30% among advanced HIV patients presenting for antiretroviral therapy. In this translational study, the TRIP intervention will involve 1) Cryptococcal meningitis screening using CrAg test plus pre-emptive treatment with fluconazole and 2) weekly mobile telephone messaging as

a home support for one month followed by monthly telephone consultations for next 3 months. The aim is to assess the cost-effectiveness and feasibility of large-scale implementation of TRIP package to reduce mortality in advanced HIV/AIDS patients starting on ARV in routine health system in urban and rural settings. Such large-scale implementation and evaluation are essential before national scale-up can be considered. The principle objective is to determine feasibility of scaling up the TRIP intervention in routine health system. The design will involve sequential implementation of the intervention in a staggering manner involving 16 urban and 8 rural health facilities from Dar es Salaam and Morogoro rural district, respectively. Our primary endpoint will be all-cause mortality. Secondary endpoints will include adherence, costs of the strategies and patient retention on ART. The implementation involves packaging activities into four work packages. 1) Project management; 2) Translation, dissemination and adaptation of REMSTART package; 3) Implementation and evaluation; and 4) Networking and Capacity building.

Integrating the diagnosis and management of HIV-associated central nervous system (CNS) infections into routine health services in low- and middle-income countries (LMICs) {Driving Reduced AIDS-associated Meningo-encephalitis Mortality (DREAMM)} - NIMR Muhimbili

This is an implementation study with evaluation done using a before-after design done in 3 phases: 1) Audit; 2) Training and 3) Algorithm implementation. The study population is 450 HIV-infected patients admitted with symptoms and/or signs of meningo-encephalitis such as tuberculosis, Cryptococcal, Toxoplasmosis and bacterial meningitis. It is conducted in 3 geographically distinct sites in Sub-Saharan Africa: 1) Central Africa-Hôpital Central Yaoundé, Cameroon; 2) East Africa-Amana Hospital, Dar Es Salaam, Tanzania; 3) Southern Africa- Kamuzu Central Hospital, Malawi. Intervention will include implementation of point of care tests within a diagnostic and treatment algorithm together with support and additional training of laboratory and clinical staff to reduce all-cause mortality in patients with meningo-encephalitis at 2 and 10 weeks.

RV 262 Study (HIV Vaccine Trial) – NIMR Mbeya

This study evaluates the safety and tolerability of PENNVAX™-G DNA (env & gag) administered by IM Biojector® 2000 or IM CELLECTRA® electroporation followed by IM MVA-CMDR (HIV-1 CM235 env/CM240 gag/pol) boost in healthy HIV-uninfected adult participants. The primary objective is to evaluate the safety and tolerability of the proposed vaccine regimen. Methods: This Phase I Study is a randomized, placebo controlled, double-blinded, with respect to study products, and is conducted at sites in Kenya, Tanzania and Uganda. The Kenya and Tanzania sites will each enrol twenty participants and Uganda will enrol a total of forty participants. Participants will be randomized 4:1 to receive PENNVAX™- G DNA at a dose of 4 mg or placebo administered using either the Biojector® 2000 needleless device or the CELLECTRA® IM EP device. The MVA-CMDR (HIV-1 CM235 env/ CM240 gag/pol) boost will be administered by IM injection at 1×10^8 pfu on days 84 and 168.

HVTN 111 (HIV Vaccine Trial) - NIMR Mbeya

This is a phase 1 clinical trial to evaluate the safety and immunogenicity of HIV clade C DNA and of MF59-adjuvanted clade C Env protein, in healthy, HIV uninfected adult participants. This study is implemented under the P5 program (the Pox Protein Public Private Partnership (P5), is a group of vaccine developers, funders, and implementers, which was created to build on the RV144 results with the goal of improving the pox-protein regimen and enhancing the level and/or duration of protection seen in the RV144 study). The Primary objectives are to evaluate the safety and tolerability of clade C DNA and bivalent gp120 protein and MF59 adjuvant in each vaccine regimen and to evaluate the immune responses at the Month 6.5 time point (2 weeks after the 4th vaccination) of clade C DNA and bivalent gp120 protein and MF59 adjuvant in each vaccine regimen. Design: Multicentre, randomized,

controlled, double-blind trial conducted in six sites in Southern African countries. HVTN 111 has 4 active groups and 2 placebo groups and will compare DNA priming administered at Months 0 and 1 followed by DNA + Protein + MF59 boosting at Months 3 and 6 versus DNA + Protein + MF59 co-administered at Months 0, 1, and 6. **Participants:** A total of 132 healthy (28 in Tanzania), HIV-uninfected volunteers aged 18 to 40 years; 120 vaccinees and 12 placebo recipients.

HVTN 703/HPTN081 (HIV Vaccine Trial) – NIMR Mbeya

A phase 2b study to evaluate the safety and efficacy of VRC01 broadly neutralizing monoclonal antibody in reducing acquisition of HIV-1 infection. Effective biomedical interventions are needed to reduce the acquisition of HIV. The global HIV-1 epidemic continues and while many countries have made progress toward levelling HIV prevalence over the last few years, micro-epidemics of infection continue to occur in nearly all regions, even in countries possessing the full toolkit of proven prevention approaches. The Vaccine Research Center (VRC), NIAID, NIH has developed VRC01, a broadly neutralizing human mAb that targets the HIV-1 CD4 binding site. This mAb was originally discovered in a participant infected with HIV-1 for more than 15 years who maintained viral control without use of antiretroviral therapy (ART). VRC01 has the capacity to neutralize a broad range of HIV-1 strains in vitro and has conferred protection against simian-human immunodeficiency virus (SHIV) challenges in nonhuman primate (NHP) studies. It has an acceptable safety profile, as seen in previous phase 1 studies. Primary objectives are to evaluate the safety and tolerability of VRC01 mAb administered through IV infusion in each of 2 cohorts and to determine if the VRC01 mAb prevents HIV-1 infection and to estimate the level of efficacy in each of 2 cohorts. **Design:** The study is a multicentre, randomized, controlled, double-blind conducted in North and South America, and Southern Africa. **Participants:** 1500 HIV uninfected women volunteers aged 18 to 50 years at risk of HIV-1 infection from southern Africa; 2:1 active: control allocation total 1000 VRC01 mAb, 500 control.

RV 217: HIV-1 Prevalence, Incidence, Retention, Host Genetic and Viral Diversity in High Risk Cohorts in East Africa and Thailand” RV 217 Study (Cohort Study) - NIMR Mbeya

This study measures the epidemiology of HIV in a cohort drawn from high-risk populations in these countries and also characterizes behavioural and other risk factors associated with HIV-1 infection, and augment HIV-1 prevention and education programs, human resources, and laboratory infrastructure to support future vaccine trials. The study is divided into two parts, a pilot study to assess feasibility (A) and the full study (part B). About 500 participants will be enrolled in the study (200 for part A and 300 for part B). Only after establishing feasibility of the proposed design in part A would enrolment open fully in part B. The study itself, as conducted in both Parts A and B, incorporates two phases (I, II). Very frequent surveillance as proposed in the study has not been conducted in the HIV field. It is possible that participants will either be unavailable this frequently or unwilling to participate, therefore a pilot study is proposed to ensure that protocol procedures are going to be successful in meeting the audacious goals of the study. **Primary Objectives:** (1) Define the risk behaviour, prevalence and incidence of HIV infection and retention of a high-risk cohort of adults in Thailand, Uganda, Kenya and Tanzania and (2) Obtain approximately 150 acute HIV infections (AHI) with at least 30% captured within Fiebig stages I and II to support the full characterization of host responses and viral dynamics. **Methods:** The main study activity, or phase I, is the observational cohort or surveillance activity which will last for 15 months.

RV 329 D (The AFRICOS study) - NIMR Mbeya

AFRICOS is an open-ended prospective cohort study, enrolling 3000 HIV infected adults and 600 HIV uninfected adults at MHRP PEPFAR-associated clinical sites in Kenya, Tanzania, Uganda and Nigeria. The study will follow participants every six months and will collect social, demographic, clinical and

laboratory data as well as blood and sputum samples for storage in the AFRICOS Repository. The Primary objective is to longitudinally assess the impact of clinical practices, biological factors and socio-behavioural issues on HIV infection and disease progression in an African context. These areas include social and behavioural domain; medical-HIV prevention and management (programmatic); Medical-HIV management (subject); medical-opportunistic infections and other morbidities; Human papillomavirus and other STIs; viral Hepatitis; Malaria; Stools pathogens (prevalence of helminth and bacterial stool pathogens and their impact on HIV disease outcomes); test characteristics for rapid diagnostic tools for co-infections (including Hepatitis B, Hepatitis C, malaria, and tuberculosis) as they apply to the PEPFAR setting, Medical-Maternal-child transmission management; medical-Prevention of horizontal HIV infection and medical-host genetics and pathogenesis.

RV 398 (HIV Therapeutic Trial) - NIMR Mbeya

Long-term use of antiretroviral therapy (ART) in HIV-positive persons may be challenged by the need for high-level lifelong adherence to a daily regimen, development of drug resistance and cross-resistance, short and long-term toxicities, and cost. Even with complete and durable viral suppression, standard antiretroviral therapies do not fully restore health, as some degree of immunodeficiency and/or chronic immune activation and inflammation persists. Furthermore, the large and growing global population of HIV infected individuals and the costs of ART present a significant challenge for providing treatment to those in need, particularly through public health systems where resources are already constrained. There is, therefore, a growing interest and need for the development of curative approaches for HIV that include treatment strategies that confer durable virologic control with less frequent dosing or even sustained remission in the absence of ART. The Vaccine Research Center (VRC)/NIAID, Division of AIDS (DAIDS)/NIAID, and MHRP are collaborating to evaluate the clinical uses of VRC01 in these acutely diagnosed populations. This broadly neutralizing human mAb is thus far demonstrated to be safe and well tolerated in initial Phase 1 studies. It has also been demonstrated to decrease viremia in a rhesus macaque model. The current study aims to determine the safety and impact of mAb therapy on AHI in humans. It will evaluate the effect of VRC01, with and without ART, on viremia and the establishment of an HIV-1 reservoir during early acute infection. Primary Objectives are (1) Safety of VRC01 in acutely HIV-infected viremic individuals and (2) Impact of VRC01 on plasma viremia in each mAb arm compared to the ART plus placebo control at day 7 (+/- 1 day). Methods: This is a placebo-controlled study of the safety and impact of broadly neutralizing monoclonal antibody therapy with VRC01 on viremia in acute HIV infection, alone or in combination with antiretroviral therapy (ART). Twenty-four subjects will be enrolled during early acute HIV infection, as defined by two positive nucleic acid amplification tests (NAATs) for HIV-1 RNA within 21 days of a prior negative NAAT (as determined during their participation in RV 217). They will be randomized to three groups: ART initiation and single placebo infusion, ART initiation and single infusion 40mg/kg VRC01 and Single infusion 40mg/kg VRC01ART initiation.

HVTN 120 - NIMR Mbeya

HVTN 120 will compare the HVTN100/HVTN702 regimen (without a boost at Month 12) with two corresponding regimens containing the AS01_B adjuvant, one at the same protein dose (100 mcg), and the other at a lower protein dose (20 mcg). As such, HVTN 120 will generate supporting safety and immunological data regarding protein dose and adjuvant type in context of the HVTN 702 regimen. Systematic evaluations of well-characterized adjuvant/immunogen formulations, such as proposed in HVTN 120, will aid in developing an HIV vaccine that can elicit and drive effective and durable functional immune responses against HIV. With that, results can help guide the way forward in the development of an efficacious preventative HIV vaccine regimen. Once the optimal dose and adjuvant have been determined, further trials, in a sequential manner, can be used to improve upon the current regimen.

Primary objectives (1) to evaluate the safety and tolerability of ALVAC-HIV and bivalent gp120 protein/MF59 or bivalent gp120 protein/AS01_B; (2) to compare HIV-specific CD4⁺ T-cell response rates at the month 6.5 timepoint (2 weeks after the fourth vaccination) of ALVAC-HIV and bivalent gp120 protein/MF59 to each of the bivalent gp120 protein/AS01_B vaccine regimens and (3) to compare HIV-specific Env-gp120 binding antibody response magnitudes at the month 12 timepoint (6 months after the fourth vaccination) of ALVAC-HIV and bivalent gp120 protein/MF59 to each of the bivalent gp120 protein/AS01_B vaccine regimens. Design: The study is a multicentre, randomized, controlled, double-blind.

bNAb Study – NIMR Mbeya

In natural HIV disease, a small fraction (1-2%) of infected individuals develops exceptionally high titres of HIV-1 neutralizing serum activity. Antibodies isolated from these individuals have been shown to be highly active against a broad range of different HIV strains and are therefore called broadly neutralizing antibodies (bNAbs). These antibodies are in fact able to prevent (s)HIV infection in animal models and therefore of great interest for the development of an HIV vaccine. Information of neutralizing antibodies in patients from Africa is still scarce and would be of great value in the development of adapted HIV vaccine strategies in these regions. In this study we therefore aim to study African HIV-infected individuals, who have developed neutralizing antibodies using highly specialized laboratory methodologies. Primary Objective: The primary objective of this study is to identify HIV-infected patients which exhibit exceptional HIV-1 neutralizing activity (so called elite neutralizer) and to perform in those patients in depth characterization. Methods: Observational cohort study in HIV-infected, preferentially ART-naïve patients from various health facilities involved in HIV Voluntary Counselling and Testing (VCT) and HIV Care and Treatment (CTC) within Mbeya Region. The study will screen a total of 500 participants for identification of broad neutralizing HIV-1 antibodies (a single visit) and those identified as elite neutralizers will undergo a second visit which is expected to take place in maximum 6 months after the screening visit. The recruitment duration is expected to be 18 months.

TWENDE – NIMR Mbeya

The East African 'TWENDE' project an abbreviation of "Tuberculosis Working to Empower the Nations Diagnostic Effort" is funded by the European Union through the European & Developing Countries Clinical Trials Partnership (EDCTP). The word 'TWENDE' is a Swahili word that means "Let's go" and indeed encourages one another within and beyond the consortium to move forward and in this case against TB. This project aims to understand and overcome the barriers to the implementation of WHO endorsed TB diagnostics in the three East African Countries that forms part of the 22 global TB High Burden Countries. Partner research institutions in E. Africa involved in the TWENDE project includes; Makerere University Kampala (Uganda), CPAR Uganda, Kenya Medical Research Institute, NIMR-Mbeya Medical Research (NIMR-MMRC), Mbeya and Kilimanjaro Clinical Research Institute (KCRI), Moshi, University of St. Andrews together with the East African Health Research Commission (EAHRC) of the East African Community. The project further seeks to dialogue and enlighten policy makers and implementers on their stake in ensuring availability of good diagnostic services as well as uptake of new innovation for public benefit.

Validation of rapid tests for the serological diagnosis of HIV in 9 to 24 months old children - NIMR Tanga

Main objective: To evaluate the performance of three rapid tests for detection of HIV infection in children 9-24 months of age. Other specific objectives include (1) to evaluate the sensitivity and specificity of the rapid serological test HIV- 1/2 Bio- Manguinhos screening in children 9-24 months, taking as reference molecular testing; (2) To evaluate the sensitivity and specificity of the rapid Oral

Fluid test HIV- 1/2 Bio- Manguinhos screening in children 9-24 months, taking as reference molecular testing; (3) To evaluate the sensitivity and specificity of the rapid imunoblot test HIV- 1/2 Bio- Manguinhos in children 9-24 months, taking as reference molecular testing and; (4) Evaluate variations in accuracy of rapid tests according to clinical features of mothers and children: Prenatal treatment of the mother; early treatment of the child etc.

6.2 TUBERCULOSIS

Partially Randomized Trial to Evaluate the Efficacy, Safety and Tolerability of a 4-month Treatment of Bedaquiline plus Pretomanid plus Moxifloxacin plus Pyrazinamide (BPamZ) Compared to a 6-month Treatment of HRZE/HR (Control) in Adult Participants with Drug-Sensitive Smear-Positive Pulmonary Tuberculosis (DS-TB) and a 6-month Treatment of BPamZ in Adult Participants with Drug Resistant, Smear-Positive Pulmonary Tuberculosis (DR-TB). Protocol name: SimpliciTb – NIMR Mwanza

The objective of this trial is to evaluate the efficacy, safety and tolerability at 8 weeks, 52 weeks and 104 Weeks post the start of the following treatment regimens in participants with BPamZ given for 17 Weeks or Standard HRZE/HR treatment given for 26 weeks (Drug Sensitive TB) or BPamZ given for 26 Weeks (Drug Resistant TB).

Phase II Trial to Evaluate Prevention of Infection with *Mycobacterium tuberculosis* (Mtb) of H56:IC31, a novel TB vaccine, in Tanzanian Adolescents (POI trial) – NIMR Mwanza

Primary Objectives: To evaluate the safety profile of H56:IC31 compared to placebo in HIV-uninfected, remotely BCG vaccinated adolescents and to evaluate prevention of Mtb infection by H56:IC31 compared to placebo, as measured by rates of conversion using an ESAT-6 free IGRA. Primary Outcome Measure (Safety): Frequency and severity of adverse events. Primary Outcome Measure (Efficacy): ESAT-6 free IGRA conversion from a negative to positive test at any time point after Day 84 and through end of follow-up for the primary endpoint.

Feasibility of integrating Chronic Lung Diseases into the TB programme - NIMR Mbeya & NIMR Headquarters

In 2008, the Stop TB Department of the World Health Organization (WHO) developed the Practical Approach to Lung Health (PAL). PAL is a symptom-based approach to manage patients who seek care for respiratory symptoms within primary health care settings. There are, however, few rigorous, published studies which have adopted an action research approach to understand and improve upon the integration of chronic lung diseases (CLDs) services within the health system, starting with linkages from within the community to facility-based primary health care and further upwards referral to secondary or tertiary care as appropriate. The rapid assessment was therefore done in Dodoma Municipality in order to understand and observe the context of the research, including current practices in the management of TB and Chronic Lung Diseases and community linkages. Informal discussions were held with a range of stakeholders from regional, district, health facility (district hospital and health centre) and community level (CHWs and sputum fixers).

The East African Public Health Laboratory Networking Project (EAPHLNP): Evaluation of impact of new Tuberculosis diagnostics on patient health outcomes: An East African multi country proposal - NIMR Muhimbili

This was a five years project conducted in five East African countries Tanzania, Kenya, Uganda, Rwanda and Burundi with the main aim of evaluating the impact of new TB diagnostic tests on patient health

outcomes. In Tanzania the project is conducted in Mara, Mwanza, Kilimanjaro, Arusha, Zanzibar and Pwani.

Improving Tuberculosis case detection and diagnosis among children in Tanzania - NIMR Muhimbili

This study aims to determine the performance of stool Xpert among TB suspects. The study populations are all TB suspects with emphasis on children receiving services in selected facilities in Arusha, Kilimanjaro, Pwani, Dar es Salaam, Mtwara and Morogoro. If all turns positive, we can revolutionise the diagnosis of TB in children in Tanzania by using stool instead of sputum samples which is hard to get among children.

Factors associated with low enrolment to treatment among patients with Multi-Drug Resistant Tuberculosis in Tanzania - NIMR Muhimbili

This study is conducted in all districts in the country with MDR-TB patients who are not yet enrolled into care. The main objective is to determine the number and factors associated with low enrolment to treatment among patients with MDR-TB in Tanzania. We reviewed all MDR TB patients registered in the GeneXpert alert system from the Central Tuberculosis Reference Laboratory (CTRL) during the years 2013 – 2015 and compared with those who were/have received MDR TB care at Kibong'oto to get those who were not enrolled into treatment. We also interviewed respective regional TB & Leprosy Coordinator and District TB & Leprosy Coordinator.

Improved diagnosis of extra-pulmonary tuberculosis among adults and children: Implementation of a rapid, robust, sensitive and specific immunochemistry-based assay in the routine tuberculosis control programme settings (IRRSSIA study) - NIMR Muhimbili Extra-pulmonary TB accounts for approximately 14-40 % of all TB infections, and the diagnosis has always been a challenge. The routinely used diagnostic tests have low sensitivity due to the paucibacillary nature of the disease. We have developed a method based on immunochemistry to detect the secreted mycobacterial antigen MPT64 from various biological fluids, aspirates and tissues. It aims to improve the diagnosis and increase the case detection of extrapulmonary TB in adults, children and HIV-TB coinfecting by introducing the assay in the selected tertiary care hospitals in high TB (Tanzania, Pakistan and India) and high-low (Norway) human immunodeficiency virus (HIV) burden countries using a routine TB control programme.

Translation research into policy and practice: Scaling up evidence based multiple focus integrated intensified TB screening to end TB (EXIT-TB) in the East African region – NIMR Muhimbili

The aim is to accelerate the translation of research into policy and practice through implementation of Evidence Based Multiple Focus Integrated Intensified TB Screening package (EXIT-TB). The EXIT TB package will involve: i) Screening all patients for TB who passively report cough at the out patients department (OPD) and reproductive and child health (RCH) clinics ii) actively screening of all children with a contact with TB, iii) Testing for TB irrespective of TB symptoms among all patients with advanced HIV/AIDS diseases ($CD4 < 200$ cells/mm³ and/or WHO stage 3 or 4 and iv) actively screen for TB among diabetic patients. We believe that EXIT-TB package will increase TB case detection, reduce treatment delay, increase number of TB patients including women and children put into TB care, and thus reduce TB transmission and mortality in the East Africa (EA) region. The study will be implemented in Tanzania (Lead country), Kenya, Uganda, Ethiopia and Sudan.

The Tuberculosis Xpert in Tanzania - Local perspectives on a global technology roll-out – NIMR Muhimbili

In 2010 the World Health Organization officially endorsed the GeneXpert assay Xpert MTB/RIF (Cepheid, Sunnyvale, California) for detection of Mycobacterium Tuberculosis, and subsequently the world has experienced something close to a revolution in the field of TB-diagnostics. The United Republic of Tanzania is regarded as one of 22 global high-burden TB-countries, and currently a large national scale-up of the GeneXpert technology is underway. Although a massive body of research exists on the assay both internationally and specifically for Tanzania, there are significant gaps in the literature, especially related to impact. This project is of an anthropological nature and intends to contribute to addressing this gap in Tanzania from a social scientific perspective. Hence, we are looking beyond the strictly clinical impacts of GeneXpert, and rather address socio-medical and socio-political structures being affected by- and affecting the technology. Methodologies employed are qualitative, and entail participant observation, semi-structured interviews and text analysis.

A Phase 2 Open-Label Partially Randomized Trial to Evaluate the Efficacy, Safety and Tolerability of combinations of bedaquiline, moxifloxacin, PA-824 and pyrazinamide during 8 weeks of treatment in Adult Subjects with Newly Diagnosed Drug-Sensitive or Multi Drug-Resistant, Smear-Positive Pulmonary Tuberculosis. Acronym: NC005 Study (TB Drug Trial) - NIMR Mbeya

Although some progress has been made in recent years in controlling TB globally, TB has remained a problem in the developing countries of Africa, Asia and South America. The 6 months duration of treatment plus side effects, result in poor compliance which is particularly likely to occur after the second month of treatment. As a result of poor treatment compliance, drug resistance is becoming more common and fears of an epidemic with virtually untreatable strains of TB – extensively drug resistant TB (XDR-TB) - are growing. The current study NC-005, is an 8 week trial designed to further the investigation into the combination of some of these new agents, namely bedaquiline, PA-824 and pyrazinamide (J-Pa-Z) in DS-TB and bedaquiline, moxifloxacin, PA-824 and pyrazinamide (J-M-Pa-Z) in MDR-TB. This study follows study NC-003 which demonstrated that bedaquiline, PA-824 and pyrazinamide have good 14 day early bactericidal activity. The primary objective of this study is to evaluate the bactericidal activity, safety, and tolerability of J-Pa-Z in drug-sensitive TB and J-M-Pa-Z in MDR TB. Design and Scope: This is a phase 2, multi-centre, open label, partially randomized clinical trial in four parallel treatment groups. Subjects with Drug-Sensitive (DS) TB will be randomized to receive either J (loading dose/t.i.w)PaZ; or J(200mg)PaZ; or HRZE. Subjects with Multi Drug-Resistant (MDR) TB will receive J(200mg) MPaZ. Participants will be recruited from Tanzania, South Africa and Uganda with appropriate sites recruiting Drug-sensitive TB (DS-TB) and/or Multi Drug-resistant TB (MDR-TB).

A Phase 3 Open-Label Partially Randomized Trial to Evaluate the Efficacy, Safety and Tolerability of the Combination of Moxifloxacin plus PA-824 plus Pyrazinamide after 4 and 6 months of Treatment in Adult Subjects with Drug-Sensitive Smear-Positive Pulmonary Tuberculosis and after 6 months of Treatment in Adult Subjects with Multi-Drug Resistant, Smear-Positive Pulmonary Tuberculosis. Acronym: NC006 Study (STAND Trial) - NIMR Mbeya

STAND trial is a phase 3 TB treatment trial designed to investigate the combination of Moxifloxacin, PA-824 and pyrazinamide (M-Pa-Z) in drug sensitive-TB and MDR-TB subjects. This study followed an eight-week Phase 2b trial, NC-002-(M-Pa-Z) which demonstrated that combination regimen was effective, safe and well tolerated supporting the evaluation of this combination in a Phase 3 trial. Data from preclinical trials suggested that a regimen consisting of moxifloxacin plus PA-824 plus pyrazinamide may not only be appropriate for treating both DS and MDR-TB but may also shorten duration of therapy. Objectives: The primary objective of this study was to assess the efficacy, safety

and tolerability of moxifloxacin 400 mg plus PA-824 100 mg plus pyrazinamide 1500 mg regimen after 4 months of treatment, moxifloxacin 400 mg plus PA-824 200 mg plus pyrazinamide 1500 mg regimen after 4 months of treatment, moxifloxacin 400 mg plus PA-824 200 mg plus pyrazinamide 1500 mg regimen after 6 months of treatment in subjects with drug-sensitive (DS) pulmonary TB compared to standard HRZE treatment. *Design and Scope:* Phase 3, multicentre, open-label partially randomized clinical trial in five parallel treatment groups. Subjects with DS-TB had a screening period of up to a maximum of 9 days, and was randomized to receive either MPa100Z daily for 4 months; or MPa200Z daily for 4 months; or MPa200Z daily for 6 months; or HRZE combination tablets daily for 2 months followed by HR combination tablets daily for 4 months. Subjects with MDR-TB had a screening period of up to a maximum of 14 days and were assigned to receive MPa200Z for 6 months. All subjects had a follow-up for period of 24 months from start of therapy.

Pathogenesis and risk factors of long-term sequelae of pulmonary TB defining individual outcomes and public health impact. “TB Sequel” - NIMR Mbeya

TB Sequel is a multi-country multisite cohort study describing the evolution of pulmonary TB symptoms and functional lung impairment during and after TB treatment. Additionally, the study aims to assess immunological, microbiological and social economic factors affecting pulmonary TB outcomes. Recruitment will be conducted at the African sites including NIMR Mbeya site, MRC Unit the Gambia, National Institute for Research in Mozambique and at the University of Witwatersrand in Johannesburg South Africa. In each site 400 participants will be recruited making overall total 1600 of participants.

EIRMMA-TBT – NIMR Mbeya

Current TB treatment monitoring options which relies on detection of Mtb from sputum specimens are not sufficient and has many drawbacks. Unlike, HIV where host markers (CD4 count) and pathogen markers (viral load) are used to monitor the progress of patient on anti-retroviral therapy (ART), host markers for monitoring the success of TB treatment are not yet validated despite some of the recent progress. For effective TB treatment monitoring, fast, sensitive and specific tests which can measure Mtb in real time are needed. The molecular bacterial load assay (MBLA) which measures the decline of Mtb 16SrRNA during treatment has recently been developed. The performance of MBLA is better than culture-based methods for patients on standard TB therapy. Additional benefits of MBLA includes not being affected by sample contaminants, reproducible and adaptable in resource poor settings of the tropic where there is high prevalence of TB. The main objective is to evaluate the feasibility of MBLA for monitoring TB treatment response in routine programme settings and its capability to detect dormant state of *M. tuberculosis*. *Design and Scope:* This is an observational cohort study. Pulmonary TB patients will be enrolled at the time of TB diagnosis and prospectively followed for six months after treatment initiation in line with the National TB and Leprosy control guidelines (NTLP). Treatment and sample collection will be performed in the respective health facility by the trained Direct Observed Treatment Short course nurses (DOTS). All clinical assessments and sample collections for mycobacteriological treatment response assessment will be performed according to the pre-defined schedule of event and NTLP treatment monitoring schedules.

Reach4Kids Africa: Evaluating novel diagnostics and enabling preventive measures for childhood tuberculosis in Sub Saharan Africa – NIMR Mbeya

Reach4Kids Africa is a multi-country multisite childhood TB diagnostic study aiming at addressing two important bottle necks for TB control in children, namely lack of diagnostics and lack of roll out of IPT to those most in need. Children below 15 years of age and who have TB symptoms will be prospectively recruited into the study. The study will establish a repository of samples for testing performance of

existing diagnostics and to validate novel assays in order to develop reliable diagnostic tools for childhood tuberculosis. The study will be conducted in four sites in Africa including Tanzania, Gambia, Mali and Nigeria. In each site 200 participants (children) will be recruited making overall total 800 of participants.

6.3. MALARIA

Influence of Indoor Residual Spraying on resting behaviours of malaria vectors in relation to community protection in Kagera-Tanzania – NIMR Headquarters

Indoor insecticide-based control measures have significantly reduced transmission of malaria, yet elimination remains a far target. The prevalence of malaria in Tanzania is 14% while Kagera is the region with highest prevalence of malaria at 41%. Despite the government efforts to control malaria, the prevalence is high; however, few studies have been conducted in Tanzania to assess resting behaviours of malaria vectors in IRS-implementing areas which might also be affecting the vector control measures in place. Objective: To determine resting behaviours of malaria vectors in IRS area (Missenyi) and non- IRS area (Karagwe). Methodology: This is a cross-sectional study with both quantitative and qualitative approach, a simple random sampling method will be applied to obtain households in which mosquito collections will be done, second part will be on interviewing heads of households on their; socio-economic factors, behaviours and complementary interventions will be conducted. The relation between malaria vector resting behaviours and IRS implementation will be evaluated.

Efficacy and safety of artemether-lumefantrine for the treatment of uncomplicated falciparum malaria in Tanzania – NIMR Headquarters

The World Health Organization (WHO) recommends regular surveillance of antimalarial efficacy to monitor the performance of different drugs. The Tanzanian National Malaria Control Programme (NMCP) in collaboration with its partners have been implementing therapeutic efficacy studies (TES) to monitor the performance of different antimalarial drugs in the country. This study is being carried at four sentinel sites in the NMCP framework to assess the efficacy and safety of Artemether-Lumefantrine (ALu) for the treatment of uncomplicated falciparum malaria in Tanzania. Objective: To assess the efficacy and safety of ALu for the treatment of uncomplicated falciparum malaria in Tanzania.

Malaria transmission blocking effects of MMV compounds: activity against early sporogonic development in vitro on Plasmodium berghei Pb.CTRPp.GFP strain - NIMR Headquarters

Malaria transmission blocking strategy focuses on the availability of medicines active on both asexual and sexual stages of Plasmodium, thus with both curative and transmission blocking activity. The aim of the present work was to investigate whether the six polyamine inhibiting compounds in the MMV Malaria Challenge Box with higher antimalarial activity in vitro viz: M1, M2, M3, M5, M6 and M8 were evaluated for their activity against early sporogonic development in vitro on Plasmodium berghei Pb.CTRPp.GFP strain. Methods: Early sporogonic development P. berghei assay P. berghei CTRPp.GFP, a strain expressing the green fluorescent protein (GFP) exclusively at early sporogonic stages (zygotes, ookinetes, and early oocysts), was used to infect BALB/c mice and recover P. berghei gametocytes for the early sporogonic development assay. Plasmodium species: P. berghei CTRPp.GFP strain, expressing GFP exclusively at early sporogonic stages (zygote and ookinete), for the assessment of molecules' activity against the development of early sporogonic stages (ESS) viz; (zygotes + retorts + ookinetes) in vitro.

Development of PfEMP1 based malaria vaccines – NIMR Tanga

The overall aim of these studies is to find out correlates of malaria protection with respect to levels of antibodies against malaria antigens. Furthermore, it involves the characterisation of parasites for development of anti PfEMP1 malarial vaccines. Methodology: The study sites are Korogwe District Hospital (KDH), the NIMR Korogwe Research Laboratory, Magu District Hospital and 2 villages within Korogwe District namely, Mkokola (lowland) and Kwamasimba (highland). The paediatric study recruits children aged less than five years of age, admitted at the paediatric ward of KDH with the intention to treat (ITT) for malaria whereas the PCD of febrile malaria episodes through CORPs is done to individuals of all ages in the two study villages of Mkokola and Kwamasimba. Red blood cells infected with *P. falciparum* were cultured and assessed for their ability to bind to various human receptors including endothelial protein C receptor (EPCR) and CD36. The *P. falciparum* malaria parasite proteins are implicated in the pathogenesis of various clinical syndromes of falciparum malaria and EPCR in particular has been shown to be a candidate receptor where *P. falciparum* strains causing cerebral malaria (CM) bind. The CORPs study involves collection of finger prick blood for preparation of thick and thin blood smears and rapid diagnostic tests (mRDTs) of malaria. Community malariometric cross-sectional surveys are conducted on annual basis during peak transmissions whereby finger prick blood is collected for malaria diagnosis using mRDTs and microscopy. Filter paper blood and plasma samples are also collected for subsequent molecular and immunological analyses.

Efficacy and safety of artemether-lumefantrine for the treatment of uncomplicated falciparum malaria in mainland Tanzania - NIMR Tanga

The general objective of this study is to assess the therapeutic efficacy and safety of artemether-lumefantrine (AL) for the treatment of uncomplicated falciparum malaria at 8 sites (Kyela, Mkuzi, Kibaha, Ujiji, Nagaga, Chamwino, Igombe and Mlimba) in Mainland Tanzania. Specific Objectives: 1. To measure the clinical and parasitological efficacy of AL in patients aged 6 months - 10 years, suffering from uncomplicated falciparum malaria by determining the proportion with early treatment failure, late clinical failure, late parasitological failure or adequate clinical and parasitological response as indicators of efficacy 2. To differentiate recrudescence from new infection by polymerase chain reaction (PCR) analysis. 3. To evaluate the incidence and severity of adverse events.

Efficacy of artemether/lumefantrine and Dihydroartemisinin-piperaquine and the effects of human gene polymorphism in the drug metabolizing enzymes on treatment outcome among patients with uncomplicated falciparum malaria in Tanzania – NIMR Tanga

Following changes of malaria treatment guidelines in Tanzania in 2006, Artemether/Lumefantrine (AL) was the only artemisinin combination therapy (ACT) that was introduced for treatment of uncomplicated falciparum malaria. However, alternative drugs such as dihydroartemisinin-piperaquine (DP) are urgently required to ensure effective case management. This study was conducted in two districts with different malaria transmission intensity to assess the efficacy and safety of AL and DP for treatment of uncomplicated falciparum malaria. It will also assess different pharmacogenomic markers, which might be associated with treatment outcome among patients treated with ACTs. The broad aim of this study was to determine the genetic polymorphism within drug metabolizing enzymes which affect treatment outcome among patients with uncomplicated falciparum malaria treated with either artemether/lumefantrine (AL) or dihydroartemisinin-piperaquine (DP). Methodology: This was an open-label, randomized; non-inferiority trial that recruited children aged six months to 10 years with uncomplicated falciparum malaria at two sites of Muheza Designated District Hospital and Ujiji Health Centre in Tanga and Kigoma regions, respectively. Enrolled children were treated under direct observation of a study nurse with standard doses of either AL or DP; and were followed-up for 28 (extended to 42) and 42 (63) days for AL and DP, respectively.

Parasite and fever clearance were monitored in the first 72 hours post treatment. The primary outcome was parasitological cure on days 28 (extended to 42) for AL, and day 42 (extended to 63) for DP. Secondary outcomes included parasite clearance in the first 72 hours post treatment and recovery of haemoglobin (Hb) levels during follow-up. Genome-wide association (GWAs) analysis will be used to assess different single nucleotide polymorphism (SNPs), located in the genes involved in the metabolism of artemisinins and partner drugs. Candidate gene approach will be used and SNPs in selected genes, including the cytochrome (CPY) genes families, acetyl transferases, glutathione transferases and glucuronosyltransferase (UDP-glucuronyl transferase) will be analysed.

Selection of *Plasmodium falciparum* Resistant phenotypes in relation to Gametocytes Carriage Dynamics following Artemisinin Combination in Africa – NIMR Tanga

The proposed study will investigate ACTs mediated selection of resistant *P. falciparum* populations in association to treatment and re-treatment outcome in the framework of monitoring resistance and assess the dynamics of transmission both gametocytes carriage and density in relation to resistant mutations following treatment and re-treatment with artemisinin combination therapies (ACTs). Samples were collected from *P. falciparum* infected patients enrolled in the ALu and AQ-AS clinical trial in Uganda and Democratic Republic of Congo, according to the study protocol (<http://www.clinicaltrials.gov/ct2/show/NCT01374581>). Bloodspot samples (3MM Whatmann) (DBS) were collected at different time points, i.e. day 0, 1, 3, 7, 14, 21, 28, and 42 as well as on any other day the patient presented with fever. The DBS were dried and stored with silica gel at 25°C. At the same time, a sample with RNA protect (Qiagen) were collected and stored at -20°C. For studies conducted in Tanzania, finger-prick blood samples were collected on filter paper (3MM Whatmann). The samples were collected at different time points Day 0, 1, 3, 7, 14, 21, 28 following WHO guidelines.

Assessing the Intrinsic and extrinsic drivers and targeting the observed resilience of malaria at selected sites in mainland Tanzania – NIMR Tanga

Overall objective: To determine the intrinsic and extrinsic drivers of persistent malaria burden in selected parts of Tanzania. Methodology: A cross-section study is being conducted in 8 districts from four regions; Geita (Nyang'hwale and Bukombe), Kigoma (Buhigwe and Uvinza), Ruvuma (Nyasa and Tunduru) and Mtwara (Mtwara DC and Nanyumbu). Entomological, parasitological, health systems, socio-economic, socio-anthropological evaluation is conducted. All households are assessed for socio-economic status and for risk factors associated with malaria transmission. In each village, 120 households are randomly sampled for parasitological survey, economic and anthropological assessment; whereby all members of the selected households are in the survey while heads of the households are interviewed to capture information on knowledge, attitude and practice towards malaria and its control. Data on health system, socio-economic, knowledge and anthropology will be analysed to determine factors associated with existing hotspots and persistent malaria burden.

IPTp with dihydroartemisinin-piperaquine and azithromycin for malaria, sexually transmitted and reproductive tract infections in pregnancy in high sulphadoxine-pyrimethamine resistance areas in Kenya, Malawi, and Tanzania: an international multi-centre 3-arm placebo-controlled trial (IMPROVE Study) - NIMR Tanga

Overall objective: To determine if IPTp with Dihydroartemisinin-Piperaquine (DP), either alone or combined with azithromycin (AZ), is safe and superior to IPTp with SP for reducing adverse pregnancy outcomes due to malaria and sexually Transmitted infections (STIs)/Reproductive tract Infections (RTIs). Methodology: An international, multi-centre, 3-arm, parallel, partially placebo-controlled, individually randomised, phase-3, superiority trial involving 4,680 (1,560 per arm) pregnant women in approximately 10 sites in areas of high malaria transmission and high SP resistance in western Kenya,

northern-eastern Tanzania and southern Malawi. HIV-negative pregnant women (all gravidae) attending for antenatal care (ANC) between 16- and 28-weeks' gestation inclusive, assessed by ultrasound dating, will be eligible. Women will be seen monthly until delivery. Mothers and infants will be followed for 6 to 8 weeks post-partum. A sub-group of women will also be followed up 6 months postpartum from some selected sites.

Efficacy and safety of artesunate-amodiaquine and dihydroartemisinin-piperaquine for the treatment of uncomplicated falciparum malaria in mainland Tanzania -NIMR Tanga

Overall objective: To assess the therapeutic efficacy and safety of artesunate-amodiaquine (ASAQ) and dihydroartemisinin-piperaquine (DP) for the treatment of uncomplicated falciparum malaria at two sentinel sites of Kibaha and Ujiji in Mainland Tanzania. Methodology: This was a single-arm prospective evaluation of the clinical and parasitological responses to directly observed treatment for uncomplicated malaria. Patients aged 6 months to 10 years with uncomplicated falciparum malaria, meeting inclusion criteria were enrolled in the study. Recruited patients were treated on site with ASAQ or DP and monitored for 28 and 42 days for ASAQ and DP respectively. The follow-up consisted of a fixed schedule of check-up visits and corresponding clinical and laboratory examinations. On the basis of the results of these assessments, patients were classified as either treatment failure (early or late treatment failure) or adequate clinical and parasitological response before and after PCR analysis to distinguish between recrudescence and re-infection. Active and passive monitoring of adverse events and serious adverse events was done for each enrolled patient. PCR genotyping will be done to determine the frequency of different single nucleotide polymorphisms (SNP) in different genes and Pfmrd1 copy number variations associated with antimalarial resistance.

Malaria Research and Capacity building for field trials in Tanzania. Acronym: MaReCa – NIMR Tanga

Overall objective: 1. To document burden of malaria in the study area over years 2. To develop and characterize efficacious malaria vaccine for children and pregnant women 3. To build malaria research capacity at masters and PhD levels 4. To establish and maintain mentorship programme 5. To sustain clinical research and clinical trials in Korogwe Research Station, Tanga Centre. Methodology: These studies are ongoing at the Korogwe District Hospital (KDH), the NIMR Korogwe Research Laboratory, Magu District Hospital and two villages within Korogwe District namely, Mkokola (lowland) and Kwamasimba (highland). The paediatric study recruits children aged less than five years of age, admitted at the paediatric ward of KDH with the intention to treat (ITT) for malaria whereas the PCD of febrile malaria episodes through CORPs is done to individuals of all ages in the two study villages of Mkokola and Kwamasimba. For the paediatric hospital study, plasma and red blood cells were separated and stored. Red blood cells infected with *P. falciparum* were cultured and assessed for their ability to bind to various human receptors including endothelial protein C receptor (EPCR) and CD36. The *P. falciparum* malaria parasite proteins are implicated in the pathogenesis of various clinical syndromes of falciparum malaria and EPCR in particular has been shown to be a candidate receptor where *P. falciparum* strains causing cerebral malaria (CM) bind. The CORPs study involves collection of finger prick blood for preparation of thick and thin blood smears and rapid diagnostic tests (mRDTs) of malaria. Community malariometric cross-sectional surveys are conducted on annual basis during peak transmissions whereby finger prick blood is collected for malaria diagnosis using mRDTs and microscopy. Filter paper blood and plasma samples are also collected for subsequent molecular and immunological analyses.

6.4 MATERNAL, NEWBORN AND CHILD HEALTH

World maternal antifibrilolytic trial (the WOMAN Trial) - NIMR Amani

Postpartum haemorrhage (PPH) is loss of blood >500 ml following normal delivery or >1000 ml following caesarean section. This is a life-threatening condition and is a common cause of maternal mortality and morbidity. There are several treatment options available for this condition. However, there is no conclusive evidence whether treatments are effective or not. Thus, a randomized placebo-controlled study was designed to determine the efficacy of tranexamic acid for control of PPH compared to a placebo. The objectives of this study were; 1) to determine proportion of death due to PPH in tranexamic acid compared to placebo arm; 2) to determine the proportion of hysterectomy due to PPH in tranexamic acid compared to placebo arm; and 3) to determine the proportion of thromboembolic events in tranexamic acid arm compared to placebo arm.

Skilful Parenting and Agribusiness Project (Building evidence for reduction of child malnutrition through skilful parenting and agribusiness-economic strengthening) - NIMR Mwanza

The objectives of this project are 1. To evaluate the feasibility of Investing in the Children and Society (ICS) model that combines Agribusiness and Skilful Parenting as well as the individual Agribusiness and Skilful Parenting in terms of reach and implementation fidelity; 2. To understand the mechanisms by which parents and program facilitators perceive how the parenting program influences the parenting behaviour; 3. To generate preliminary evidence of the integrated model's impact in comparison to Skilful Parenting only, Agribusiness only, and a wait-list control group; 4. To understand how economic strengthening programs combined with parenting support reduce the risk of violence against children; 5. To examine participating families existing needs for early childhood development and the Skilful Parenting program's potential benefits for improving responsiveness, acceptance, cognitive stimulation, and involvement and; 6. To evaluate the feasibility of conducting a multi-armed cluster RCT in rural Tanzania in preparation for a larger trial.

Family structure and wellbeing of women aged 15-35 years and their under 5 children in Kisesa, Tanzania – NIMR Mwanza

The objectives are to improve understanding of how alternative family structures influence female and child wellbeing and to infer how the relationship between family structure and wellbeing changes across the rural to urban gradient (i.e. comparing village to town life). Specific focus is placed on early/child marriage, polygynous marriage and father absence, and on relatively young women (<35 years) and their children. The project uses a mixed methods approach combining quantitative and qualitative data. Quantitative data is collected in the form of a cross-sectional survey of 700 households and anthropometric measurements of women and young children. In addition, the project utilizes existing longitudinal demographic data on the study population (on up to 35,000 individuals). Qualitative data will be collected in the form of eight focus group discussions.

Effects of anaemia before and during pregnancy on foetal growth alterations and new born health in Tanga, Tanzania – NIMR Tanga

Overall objective: To determine the effects of anaemia before and early in pregnancy on foetal growth alteration and new born health. Methodology: One cohort of 1500 women aged 18-40 enrolled before they get pregnant will be followed throughout the study period and women who conceive will be followed-up closely during pregnancy to monitor foetal growth and upon delivery the health of the baby and the mother will be evaluated. Furthermore, 480 pregnant women in their first trimester will be enrolled in pregnancy case control study and followed-up until they deliver. During scheduled visits at gestation week 11-14, 20,26,32,37 and delivery will be investigated for anaemia, micronutrients levels

and infections. At inclusion, dry blood spots will be taken for screening of hemoglobinopathies. Serial trans-abdominal ultrasound scans will be used to monitor foetal growth and at the time of delivery a thorough neonatal assessment will be done and repeated one-month post-delivery.

Evaluation of Long-Term Mortality and Morbidity Reduction After twice yearly Oral Azithromycin (MORDOR) - NIMR Headquarters

It's a three-year multi-country cluster-randomized placebo-controlled trial in Tanzania, Malawi and Niger to see if twice per year Azithromycin would reduce childhood morbidity and mortality. A total of 644 hamlets in Kilosa and Gairo districts were randomized to either azithromycin treatment arm or placebo arm. Out of the 644 hamlets, 614 will be used to follow under-five mortality over two years after biannual oral azithromycin ("Azithromycin" arm), to against children who will be on biannual oral placebo ("Control" arm).

mHealth-assisted conditional cash transfer to improve timeliness of vaccinations study - NIMR Muhimbili

The aim of the study is to develop, implement and test mHealth-assisted approach in Tanzania to increase the uptake of timely childhood vaccinations through the use of conditional cash transfers and phone-based reminders to clients. A cross sectional study conducted in selected health facilities and communities in Mtwara and Kilimanjaro regions for two years from 2016 to 2018. The study has two components – 1) formative research comprising of interviews with health providers and focus group discussions with parents of young children to identify supply and demand-side barriers to vaccinations respectively, and 2) an acceptability and efficacy evaluation of the mHealth-supported multi-tiered CCT program for improving vaccination coverage and timeliness at 6, 10 and 14 weeks and involving longitudinal follow up of children for up to 6 months of age.

6.5 SEXUAL AND REPRODUCTIVE HEALTH

Cash Transfers to Vulnerable Adolescents Evaluation Study - NIMR Mwanza

Primary Objective: To enhance understanding of how the cash transfers that the adolescent girls and young women receive affect sexual partner dynamics, specifically decision making with respect to compensated and intergenerational sex. Specific objectives are: 1. To understand the ways through which cash transfers to adolescent girls and young women may influence their sexual behaviours and dynamics with partners; 2. To explore male partner's understanding of women's involvement in the cash transfer program, and how they perceive their involvement influenced the dynamics within their relationships. 3. To explore the context of AGYW's lives and the ways in which receiving cash transfers has affected their lives and their relationships. 4. Immersion Research: To explore and develop an understanding of the local context, identify goals and experiences of AGYW and inform the development of EthnoLab and 5. EthnoLab Research: To elicit contextual factors, mental models and emotions that drive decisions and behaviours. EthnoLab also allows determination of behavioural economics principles that might be used to change current behaviour.

Genomic and immunopathological differences between human and non-human primate treponemes: Simian strains as a missing link to understand syphilis's evolution – NIMR Muhimbili.

The project combines basic research in the field of Treponema infection with capacity building and early-career research training at the African location. The overall objective is comparison of human and NHP Treponema isolates from Africa, especially in areas that are known as hotspots for Treponema infection in both humans and NHPs. The recent description of a *T. pallidum* strain which causes genital ulceration in baboons though it is genetically most closely related to non-venereal human strains, in combination with reports that indicate the zoonotic potential of West African simian strains (Smith et

al. 1971), provides evidence that NHPs may serve as a natural reservoir for *T. pallidum* as well as potentially representing a missing link that can shed light on this bacterium's evolution. The minimum sample size required is 125 human syphilis patients from Mto wa Mbu.

Case-control study to identify risk factors associated with Human Papilloma Virus (HPV) associated lesions within the female reproductive tract (2H STUDY) - NIMR Mbeya

Cervical carcinoma is the most frequent cancer in African women and the risk of developing cervical carcinoma and pre-malignant HPV lesions is ~8-fold elevated in HIV+ females despite Antiretroviral therapy. The 2H study began as a case control study, in 2013. Currently, the study has a longitudinal component, following up yearly on all women who were enrolled as cases and controls, to answer further objectives. This study investigates risk factors associated with high-grade squamous intraepithelial lesion (HSIL) or squamous cell carcinoma (SCC) within the reproductive tract of HIV+ and HIV- Tanzanian women and identify High Risk (HR) HPVs that most frequently cause such disease in HIV+ and HIV- women. The study focuses on HPV and HIV related factors, particularly on infecting HPV genotype(s) and immune system related factors, such as CD4 T cell count, antiretroviral therapy (ART) status and HIV induced dysfunction of HPV-specific adaptive immunity. In addition, socio-economic factors, such as sexual behaviour, age and smoking will be studied. This study involves different clinical and biomedical disciplines. The main objective is the identification of frequent high-risk Human Papilloma Virus types (HR HPV) associated with high risk of High grade Squamous Intraepithelial Lesions (HSIL) or Squamous Cell Carcinoma (SCC) in HIV positive and negative women. The study will also serve to establish clinical research infrastructure for cervical carcinoma clinical studies and HPV vaccine trials.

6.6 NON-COMMUNICABLE DISEASES AND INJURIES

Magnitude, awareness and prevention of non-communicable diseases among employees of the financial institution in Tanzania - NIMR Muhimbili

This study aims to investigate the magnitude and awareness of NCDs among employees of the financial institution in Tanzania as a proxy to understand the burden of NCD's and NCD's risk factors among workforce in Tanzania. The study will then develop, introduce and test a mobile NCD screening, control and prevention model at financial institution. The study will also establish willingness to pay for the mobile NCD screening and prevention model. The study was conducted for two years in Kilimanjaro, Arusha, Dar es Salaam and Morogoro. Capacity building included procurement of NCD screening and follow up facilities for NIMR Muhimbili that could be used even with another projects. The study empowered the work force from financial institutions to be able to prevent and control NCD's. In addition, the study developed NCD prevention model than can be used among the workforce in the country.

FOETAL for NCD - Foetal exposure and Epidemiological Transition: the role of Anaemia in early Life for Non-Communicable Diseases in later life – NIMR Tanga

Overall objective: is to evaluate anaemia induced alterations of foetal growth, placental development, and susceptibility to non-communicable diseases (NCDs). The new knowledge emanating from this study will promote better health interventions during pregnancy and prevention of NCDs in adult life. Methodology: Two field studies: 1) a cohort study of 1,500 non-pregnant women of whom 450 are followed-up throughout pregnancy 2) a case control study of 480 pregnant women are running in parallel and followed as two distinct groups of women. Women who become pregnant after being followed-up prior to conception in the cohort study irrespective of their haemoglobin (Hb) level and gestational age are included in the cohort study component if meeting all the inclusion criteria as previously reported, briefly, a negative urine pregnancy test (urine-Human Chorionic Gonadotropin

(HCG), aged between 18-40 years, not having a baby aged <9 months, not having attempted to become pregnant for >2 years unsuccessfully, no use of modern family planning except for condoms (e.g. implant or intrauterine device); willingness to receive scheduled/unscheduled antenatal care at the Reproductive and Child Health Clinic Korogwe District Hospital (KDH), (if conceiving during the study period; and referral to KDH at delivery as well as consenting to participate. In the case-control study, women are included and followed if they are in the first trimester with gestational age (GA≤14 weeks) while maintaining other inclusion criteria for the case-control study as indicated in the study protocol (480 pregnant women will be enrolled on 1:2 ratio for cases and controls and the controls will further be sub-divided on a 1:1:1 basis with a Hb≤8g/dL (moderate-severe anaemia) (160 women); Hb 8.1-10.9 g/dL (mild-moderate anaemia) (160 women); Hb ≥11g/dL (non-anaemic) (160 women), respectively, using HaemoCue Hb point-of-care; willingness to receive antenatal care at KDH-RCH and referral to KDH at delivery, willing and consenting to participate, any age group and when the 1:2 Hb cut-off is balanced. For both the cohort and case-control studies, pregnant women will be followed at a GA of 11-14, 20, 26, 32, 37 weeks and at delivery. Causes of anaemia, nutritional status, general health of women before and during pregnancy as well as foetal/newborn's health are characterized by ultrasound and Doppler flow measurements. Intensive laboratory work will be done to characterize the vascular endothelial growth factor-A (VEGF-A)/placental growth factor (PIGF) balance, changes in the Insulin growth factor (IGF)-axis, placental development, and epigenetic changes after exposure to anaemia. Outcome parameters: Prior to pregnancy: 1) Prevalence and severity of anaemia and NCDs among non-pregnant Tanzanian women at fertile age and their nutritional statuses. 2) Effect of anaemia on incidence of conception. During pregnancy the following outcome parameters will be attained 1) Measurements of the consequence of anaemia in 1st, 2nd and 3rd trimester on foetal growth rate 2) Determination of the effect of anaemia on newborn's body composition 3) Changes in the placental villous branching and the VEGF-A/PIGF levels after anaemia 4) Changes in the maternal and newborn IGF-axis after anaemia 5) epigenetic changes after anaemia.

Road traffic injuries and associated factors among commercial motorcycle drivers in Dar es salaam Tanzania – NIMR Tanga

Overall objective: To map hotspots and assess spatial-temporal patterns and factors associated with road traffic injuries among commercial motorcycle drivers in Dar es Salaam, Tanzania. Methodology: The project is divided into three sub-studies. The mapping of hazardous location of motorcycle injuries with an investigation of the road traffic environmental-related factors. In this part the secondary data for years between 2015 and 2016 have been extracted from traffic crashes and injuries case files. This including data on the crash characteristics and injured victims' characteristics. Coordinate of the locations of the crashes were obtained with the help of google map and the shape files for road network in Dar Es Salaam were downloaded from google. Kernel Density Estimation Method and Moran' I in Quantum GIS software are used to detect the hotspots. Weight Index Severity method is used to rank risk area of road traffic crashes based on the frequency, consequences of crashes and injury severity such as minor, major or fatal. This index is to help investigate the characteristic of areas which caused injuries with different severity levels. After identifying the hotspots areas, the road environmental will be investigated in these areas. Autoregressive Poisson Regression with effects of spatial variables will be used to assess the effects of road environment factors on the risk of the road traffic injuries.

6.7 ONE HEALTH AND ZONOOSES

Integrated Human and Animal Disease for Tanzanian Pastoralists Facing Settlement – NIMR Amani

The objectives are 1) to identify the effects of social, economic and environmental transformations on risks and vulnerabilities to infectious diseases that affect food security among pastoralists in at least two Tanzanian health districts in different agro-ecosystems (dry vs. forest savannahs); 2) to develop and test multi-sectorial community-based interventions to detect and control high-burden infectious diseases identified under objective i), and assess their implications on food insecurity; 3) to provide technical support and enhance institutional leadership of a new regional community of practice on collaborative approaches to health and food security policies and practice in Southern and Eastern Africa; and 4) to test new and existing applications of information and communication technologies among pastoral communities to assess their utility in public health and local development. This study will employ different anthropological methods for data collection.

Potential of non-human primates as a reservoir for human yaws- NIMR Muhimbili

This is the second phase of the project. The project combines basic research in the field of *Treponema* infection with capacity building and early-career research training at the African location. The overall objective is comparison of human and NHP *Treponema* isolates from Africa, especially in areas that are known as hotspots for *Treponema* infection in both humans and NHPs. The recent description of a *T. pallidum* strain which causes genital ulceration in baboons though it is genetically most closely related to non-venereal human strains, in combination with reports that indicate the zoonotic potential of West African simian strains, provides evidence that NHPs may serve as a natural reservoir for *T. pallidum* as well as potentially representing a missing link that can shed light on this bacterium's evolution. In the previous phase of this study we found that in all genome analysed simian strains, including 6 new West and 2 more East African NHP strains could be TPE strains signifying the possibility of all other NHP strains to have equal zoonotic potential and thus should be considered in yaws eradication. However, this question will be definitively answered when available data on simian infections are compared to data from humans found in areas with characterized simian infection. A minimum of 400 participants are required.

Evaluation of an antibody detecting point-of-care test for the diagnosis of *Taenia solium* taeniasis and (neuro) cysticercosis in communities and primary care settings of highly endemic, resource-poor areas in Tanzania and Zambia, including training of/and technology transfer to the Regional Reference Laboratory and health centres. Acronym “SOLID” - NIMR Muhimbili

Taenia solium taeniasis/cysticercosis (T/CC) is a neglected zoonotic parasitic disease complex with significant economic and public health impacts. Neurocysticercosis (NCC) is estimated to be responsible for 30% of cases of acquired epilepsy in endemic areas. Currently, there are no cheap, easy to apply, sensitive and specific diagnostic tools available for the detection of this parasite. The main objective of this study is to contribute to the implementation of a rapid, cheap and simple POC test for the detection of *T. solium* taeniasis and (neuro) cysticercosis in two resource-poor, highly endemic areas in sub-Saharan Africa. It also aims to improve the *T. solium* disease recognition, diagnostic and clinical case management capacities of these countries as well as their capacity to conduct diagnostic and clinical studies. The proposed project will therefore field validate the POC test, which simultaneously detects *T. solium* taeniasis and (neuro) cysticercosis, in Tanzania and Zambia, both at the community and primary health facility levels. WHO has identified the development of POC tests for *T. solium* T/(N) CC as a top priority and confirms its endorsement and implementation if successfully validated. Commercialization of the test will be facilitated once successfully validated.

Epidemiology, clinical, immunology and neuroradiological characteristics of *Taenia solium* cysticercosis in people with and without HIV/AIDS in Southern Highlands of Tanzania Mbeya and Iringa – NIMR Muhimbili

Taenia solium cysticercosis/taeniosis (TSCT) represents an emerging, neglected and potentially eradicable infectious disease in many countries of sub-Saharan Africa with huge impact on human and animal health as well as community livelihood in endemic areas. The study aim is to advance knowledge on the epidemiology and clinical characteristics of TSCT/neurocysticercosis (NCC) and its involved pathomechanisms. Research plan: 1) Large scale community-based and hospital-based studies to identify symptomatic patients with NCC and calculate the prevalence 2) A diagnostic reference laboratory for TSCT will be established and quality control as well as knowledge transfer will be performed through a TSCT reference laboratory 3) The immune response to TSCT in immunocompetent and immunocompromised hosts will be evaluated against the clinical and radiological presentation of NCC, 4) Preventative strategies will be explored through community-based studies testing the effect of different public health intervention programmes on the prevalence of porcine cysticercosis and human taeniosis.

A Randomized, Observer-blind, Placebo-controlled, Two-part, Phase 2 Study to Evaluate the Safety, Tolerability and Immunogenicity of Two Prime-boost Regimens of the Candidate Prophylactic Vaccines for Ebola Ad26.ZEBOV and MVA-BN-Filo. RV456 (Ebola Vaccine Trial) - NIMR Mbeya

Primary objective 1: To assess the safety and tolerability of different vaccination schedules of Ad26.ZEBOV and MVA-BN-Filo administered intramuscularly (IM) as heterologous prime-boost regimens in healthy adults and in HIV-infected adults, with Ad26.ZEBOV prime and MVA-BN-Filo boost vaccination on Days 1 and 29, respectively and MVA-BN-Filo prime and Ad26.ZEBOV boost vaccination on Days 1 and 15, respectively. Primary objective 2: To assess the immune responses to the EBOV GP (as measured by [enzyme-linked immunosorbent assay] ELISA antibody titre) of different vaccination schedules of Ad26.ZEBOV and MVA-BN-Filo administered IM as heterologous prime-boost regimens in healthy adults and in HIV-infected adults, with Ad26.ZEBOV prime and MVA-BN-Filo boost vaccination on Days 1 and 29, respectively and MVA-BN-Filo prime and Ad26.ZEBOV boost vaccination on Days 1 and 15, respectively. Trial design: This is a randomized, observer-blind, placebo-controlled, parallel-group, multicentre, 2-part, Phase 2 study to evaluate the safety, tolerability and immunogenicity of different vaccination regimens using Ad26.ZEBOV. These regimens will be evaluated in healthy and HIV-infected adults. A planned total of 575 subjects will be enrolled, with approximately 300 healthy subjects and 275 HIV- infected subjects.

Genetic determinants for the transmission of *Cryptosporidium* spp. among humans and animals in Africa and antimicrobial resistance – NIMR Tanga

Objectives: 1. To obtain information on transmission routes of *Cryptosporidium* species between human –human – animal in children below five years; 2. To establish *cryptosporidium* consortium in Sub-Saharan Africa countries through training and career planning to African junior scientists and built a network on cryptosporidiosis research within SSA 3. Also, to identify associations of bacterial pathogens and their subtypes with diarrhoea among children less than five years old 4. To study antimicrobial resistance.

Methodology: Study site was the Outpatient Department (OPD) Korogwe District Hospital. Patients with history of diarrhoea who met inclusion criteria were asked to provide stool samples. Prior to performing laboratory investigations, specimen was divided into two parts; for detecting *Cryptosporidium* infections and bacterial-associated diarrhoea. Crypto study; first checked the presence of *Cryptosporidium* parasite in the stool using Crypto Rapid Diagnostic Test (CerTest

BIOTEC®). Then, genomic DNA was extracted using commercial PowerSoil® Kit, Qiagen. For the detection of *Cryptosporidium* spp, quantification PCR (qPCR) was performed in a Real-time PCR (Lightcycler480) at NIMR Korogwe laboratory. All patient who were positive, additional stool specimen were also collected from household member, friends and animals so as to study the transmission route of *Cryptosporidium*. In order to illustrate *Cryptosporidium* transmission pathways, RFLP- PCR and gp60 subtyping techniques were employed to identify the genotypes and subtypes of *Cryptosporidium* respectively. The analysis of whole Genome Sequencing will later be carried out.

Prevalence of zoonotic bacterial infections: A cross-sectional study in Korogwe District, Tanga Region, North-Eastern Tanzania. Short Title: Zoonosis Study – NIMR Tanga.

Overall objective: To determine the burden of zoonotic bacterial infections in febrile in- and outpatients in Korogwe District, Tanga Region, north-eastern Tanzania. Methodology: This is an observational health care based cross-sectional survey intertwined with longitudinal follow up, involving 500 patients of all age groups presenting to the Inpatient and Outpatient Department of KDH or in satellite dispensaries within the Korogwe demographic surveillance system (DSS) area with fever or a reported history of fever within the last 48 hours. Blood samples and skin swab will be collected at recruitment, day 7 post recruitment (from PCR positive patients), and on day 28 (for convalescent samples). Collected specimens will be used for screening of zoonotic bacterial infections by molecular and serological techniques. bacterial infections amongst individuals with febrile illnesses.

Emerging viruses in Africa: Molecular identification and characterization of rodent-, shrew-, and bat-borne Hantaviruses and assessment of their public health potential. Hanta Study (Hantavirus study) – NIMR Mbeya

Hantaviruses, family *Bunyaviridae*, cause two life-threatening human zoonoses; haemorrhagic fever with renal syndrome (HFRS) and hantavirus cardiopulmonary syndrome (HCPS), with case fatality rates of up to 50% Hantaviruses are spread by aerosolized excreta of small mammals (i.e. Rodents-, Shrews- and Bats). The general objective of this study is to determine the presence of Hantaviruses and other zoonotic viruses, such as arena- and coronaviruses, in small mammals, particularly bats; and to analyse the geographical distribution of these animal reservoirs according to ecological and climatic characteristics. The animal sampling will be extended into the biomes that are so far under-represented. Methodology: This study involves a cross section survey expected to be conducted in between April 2017 and April 2018. Within this cross section we expect to collect samples i.e. blood, urine, organ necropsies (lung, spleen, liver, kidney and Intestine) for the purpose of stated objectives and further extend the fight against febrile illness.

Development of Smartphone Linked Leptospirosis POC Diagnostic Platform by use of Isothermal Target and Probe Amplification (iTPA) Technology - NIMR Headquarters

Background: Leptospirosis is a spirochaetal zoonotic infection with worldwide endemicity particularly in areas with high rainfall, close human contact with livestock, poor sanitation and workplace exposure to causative organisms. The disease is widespread in humans and wide range of animal species in Africa. Objectives: To develop and use a robust, highly sensitive, low cost point of care (POC) leptospirosis diagnostic test for rural settings of Tanzania (Target group – Morogoro and Katavi communities). Methods: Taking advantage of the electrochemical system, we will formulate a low-cost Leptospirosis diagnostics POC tool that can be effectively used in the Sub Saharan African public health system. Specifically, our technological innovation consists of 1) simple and easy to use “Syringe type DNA prep protocol”, 2) isothermal target and signaling probe amplification, and 3) multimeter based voltage measurement and transfer of the fluorescence signal wirelessly to the smartphone. The POC diagnostic platform for Leptospirosis will be field tested in local health facilities in Tanzania to

ensure efficiency. Our target platform will fall in line with the WHO's ASSURED criteria (Affordable, Sensitive, Specific, User-friendly, Rapid and robust, Equipment - free and Deliverable to end users).

6.8 NEGLECTED TROPICAL DISEASES

Impact of Mass Drug Administration for control of *Schistosoma mansoni* infections in Mwanza Region, Tanzania: Understanding factors associated with sustained high prevalence in some areas despite repeated high treatment coverage (SCORE HOT SPOT) project – NIMR Mwanza

Overall objective: To examine whether villages which do not show substantial decreases in the prevalence of schistosomiasis despite repeated, high coverage mass drug administration (persistent hot-spot villages) differ from villages which show substantial decrease in prevalence across various factors (declining prevalence villages) and evaluate the impact of an enhanced mass drug administration intervention in persistent hot-spot villages.

Electronic Data Capture for Safety Monitoring of Preventive Chemotherapy Interventions for the Control of Neglected Tropical Diseases in Rural Areas of Tanzania - NIMR Headquarters

In Tanzania reporting of adverse events related to preventive chemotherapy is paper based through the use of a yellow form available from the Tanzania Food and Drug Authority Headquarters or Zonal offices found in large cities and can also be downloaded online. Accessibility of the form therefore is limited especially in rural areas where the forms physically need to be sent. Safety reporting has not been consistent, and no good baseline exists against which to compare AE/SAE reports. Objective: To improve the performance of community safety monitoring and reporting system in the context of preventive chemotherapy and MDA for the control of NTDs through electronic data capture. Methodology: A cluster randomized field trial study was carried out in Mkuranga district of Pwani region and targeted community drug distributors (schoolteachers and community health workers), Regional Health Management Teams (RHMT), Community Health Management Teams (CHMT), school children and other residents in the selected villages. wards were randomized to intervention arm (use mobile phone for reporting AEs) and as controls. The mobile data collection application for AEs and SAEs was developed. In both intervention and control arms prior to the pre-planned NTDCP MDA rounds, project team supported local government authorities in conducting sensitization campaigns on the importance of reporting unusual drug events and reactions to CDDs during MDA round for NTDs prevention and control.

Rapid assessment of lymphoedema burden using mobile phone-based text messages by community health workers in Lindi and Coastal Regions - NIMR Headquarters

The aim of this study is to assess whether community health workers are able to effectively report and monitor Lymphatic Filariasis (LF) morbidity cases using an SMS-based morbidity surveillance tool. The secondary aims of the study are to quantify the burden of LF morbidity in these areas and evaluate barriers to Lymphatic Elephantiasis care and hydrocele surgery. Study sites: The study was conducted in Kilwa DC. Data reporters who are Community drug distributors (CDDs) attended one-day training session on how to recognize lymphoedema, staging plus the use of the USDD code for patient data reporting.

Infectiology (Wolbachia Genetics of hydrocoele & lymphoedema) – NIMR Tanga

Sub-study: Epidemiological Status of Bancroftian filariasis in the endemic communities during the era of elimination in north-eastern Tanzania. Overall objective: To assess current clinical disease and infection status of bancroftian filariasis during the MDA in endemic communities north-eastern Tanzania. Methodology: Microfilaria (Mff) were detected using counting chamber technique while filarial antigens were detected using rapid test immunochromatographic card test (Binax NOW®,

Scarborough, Inc., USA). For clinical disease, physical examination was carried out to detect lymphoedema (LE) of the lower and upper extremities and scrotal swellings.

Retinoids profile in onchocerciasis skin disease-associated morbidity: A cross-sectional field study in endemic areas in southern Tanzania. -NIMR Tanga

Sub-study 1: Assessment of clinical, parasitological and serological status after 14 years of CDTI in six communities of Ruvuma. Overall objective: To assess current clinical disease levels and infection status of OSD and serological (IgG4 specific antibodies to recombinant filarial antigen-Ov16). Methodology: Microfilaria (Mff) were detected using counting skin snipping from iliac crest right and left, after cleaning the area with antiseptic then drying. Similarly, filarial antigens were detected using rapid test SD Bioline IgG4 test to detect exposure to the parasite (onchocerca volvulus). Clinically, physical examination was carried out to detect acute and chronic skin conditions (APODs & CPOD, DMP, ATP LOD, HG& lymphoedema).

Sub-study 2: Assessment of clinical, parasitological and serological status after 14 years of CDTI in six communities of Ruvuma. Overall objective: To assess current clinical disease levels and infection status of OSD and serological (IgG4 specific antibodies to recombinant filarial antigen-Ov16). Methodology: Microfilaria (Mff) were detected using counting skin snipping from iliac crest right and left, after cleaning the area with antiseptic then drying. Similarly, filarial antigens were detected using rapid test SD Bioline IgG4 test to detect exposure to the parasite (onchocerca volvulus). Clinically, physical examination was carried out to detect acute and chronic skin conditions (APODs & CPOD, DMP, ATP LOD, HG& lymphoedema).

An epidemiological assessment of prevalence and incidence of epilepsy and its relation to onchocerciasis control measures using ivermectin in the endemic area of Mahenge, Ulanga district, Tanzania – NIMR Tanga

The main objective of this study is to identify the effect of long-term onchocerciasis control measures on the prevalence and incidence of OAE in selected villages in the Mahenge area of the Ulanga district in Tanzania. This study is designed as cross-sectional, population-based survey. A two-stage approach will be applied for case identification within the villages. The door-to-door approach was used to identify epilepsy cases. All inhabitants of the involved villages were eligible for participation and were included in the questionnaire screening survey. Suspected cases of all forms of epilepsy identified during the household screening survey were invited for clinical examination by a neurologist. For all suspected OAE cases and children 6-10 years, their serological status of Ov16 antigen was determined using onchocerciasis rapid diagnostic test (RDT).

Multi-disciplinary approach to control onchocerciasis-associated epilepsy in the Mahenge area in Morogoro region, Tanzania – NIMR Tanga

Overall objectives: 1. Increase the multi-disciplinary research capacity concerning oncho and epilepsy/NS in Tanzania. 2. Reduce rates of onchocerciasis and epilepsy/NS in the Mahenge area. Methodology: An epilepsy/NS surveillance system will be set up to identify and follow-up persons with epilepsy. Trained Community health workers (CHWs) based in the study villages will be used. Focus groups discussion, in-depth interviews and questionnaires will be used as main means of data collections. Advocacy and awareness programmes will be implemented through meetings, training sessions and by radio broadcastings. Electronic data capturing system using ODK will mainly be used in this project.

6.9 ENVIRONMENTAL HEALTH

Governance and priority setting issues in the provision of water, sanitation and hygiene (WASH) interventions in health care facilities in Tanzania: The gap between rhetoric and reality in the implementation of interventions - NIMR Headquarters

When Ebola problem occurred in West Africa in 2014, one of the key challenges in the fight of this problem was situation of water, sanitation and hygiene at health care facilities was inadequate thus hampering efforts to save lives of both health workers and Ebola patients. In Tanzania, we investigated situation of these facilities from national to community levels to assess issues of WASH interventions and identify areas for improvement. The study was a cross-sectional design and was implemented in seven districts marked as UNICEF Program Districts in Tanzania of which thirty-one key informant interviews (officials responsible for WASH activities) were conducted from Ministries of Water and Health, Development Partners, Regional and District levels.

Treatment of heavy metals contaminated wastewater in the mining areas using smart nanomaterials adsorbents: Upscaling phase – NIMR Headquarters

This is phase two of the project. Phase one of the project was designed to utilize biological wastes namely; crab shells, avocado seeds, tree fibres and chicken eggshells in combination with other naturally occurring minerals (sand) to develop simple but robust water filter systems to be used at the household level. The tons of waste from marine organisms, avocado seeds and chicken eggshell bi-products previously thrown will now be put into commercial use at the industrial scale. The nanostructured adsorbents will be synthesized from their respective waste and optimized to be used in the NanoMaji (NNM) water filters. Hence the NanoMaji (NNM) water filter (which can be recycled) was designed for household use. Furthermore, the formula removes germs (microorganisms) hence the ability to protect humans against water borne diseases. Objectives: The main goal of phase two of this project is to conduct a field trial of the innovation briefly described above in the real settings of villages in Geita and Kahama districts where water pollution resulting from artisanal gold mining activities is a big challenge.

Design and supporting delivery of sanitation and hygiene behaviour change in Tanzania (formative research) - NIMR Headquarters

Water Sector Development Programme (2006-2025) improve access to water supply, sanitation and hygiene, and improve water resources management and institutional capacity. Within the WSDP, the Ministry of Health, Community Development, Gender, and Children (MoHCDGEC) is leading a National Sanitation Campaign (NSC). Tanzania is implementing the second phase of the National Sanitation Campaign (NSC II) which ends in 2021. The study was conducted in Morogoro District Council and Misungwi District Council, Mwanza. Objective: Lead the design and support delivery of a nationwide behaviour change campaign to ensure adoption and sustainability of improved sanitation and hygiene practices in Tanzania using a behaviour centred design approach. Behaviour Centred Design combines behavioural science and marketing processes to achieve behaviour change.

Enabling universal access to safe drinking water, hygiene and sustainable sanitation technologies and services for maternal, neonatal and child health improvement in rural communities - NIMR Headquarters

Main Objective: The overall goal of the project is to improve the health and socioeconomic well-being of maternal, neonatal and children in the project community by reducing the incidence of water- and sanitation-related diseases through sustainable safe water, sanitation, and hygiene practices. Project site: Katoma Village in Katoma Ward, Geita District in Geita Region. Project Design: This project addresses adoption of sustainable WASH intervention based on community mobilization, awareness

creation through behaviour change communication (BCC), WASH facility demonstration, creation of supply chain of WASH products, promotion of operation and maintenance management systems and post construction support. NIMR will use models of water kiosks developed by STIC Labs (Tanzania) and solar water disinfection systems developed by Almega Revivo (Switzerland) to provide an innovation for the sustainable provision of safe drinking water to the poor at an affordable cost. The project will use a business model whereby long-term benefits of the WASH technologies are utilized. Safe water kiosks will be installed and run by operators employed by community water user's organization (COWUSO). The operator will receive a commission-based salary from each litre of water sold and the rest of the water revenue will be transferred to the community water fund to be established. Artisans will be trained to construct improved latrines fitted with hand washing facilities at a reasonable cost. Target and Project Population: The study targets all 701 households in Katoma village covering a population of about 3,400 inhabitants. Baseline WASH information will be collected from all 701 households whereas qualitative information will be collected through focus group discussions with community groups as well as key informant interviews with community leaders.

WASH Practices and Hospital-Associated Neonatal Sepsis: An Investigation of Sources and Transmission Routes for Neonatal Sepsis-Associated Pathogens at Muhimbili National Hospital - NIMR Headquarters

Neonatal sepsis is a leading cause of neonatal mortality, making up 20% of neonatal deaths in Tanzania in 2012 (Dutta, Slevin, Baker & Leahy-Madison, 2015). The objective of this study was to determine if the bacteria which are known to cause neonatal sepsis could be acquired within the hospital environment and if WASH practices by health care workers are associated with the presence and transmission of these bacteria. Research Design: This was a cross-sectional study, with an observational component and microbiology component. The study was carried out at the Muhimbili National Hospital Maternity Block in Dar es Salaam, Tanzania. Postnatal and labour wards were included in the study. Methods: Data collection and laboratory sample testing included: WASH Practices Observations, Water Source Sample Collection, Surface Swab Collection, Hand Rinse Collection, Water Source Sample Testing, Microorganisms tested for were *Klebsiella* spp., *Escherichia coli* and *Staphylococcus aureus*.

Prevalence of Surgical Site Infections and the Relationships to WASH Knowledge and Practices of Healthcare Workers and WASH Facilities in the Muhimbili Orthopaedic Institute (MOI) - NIMR Headquarters

A study addressing the WASH practices of the healthcare staff at the Hospital would provide beneficial recommendations to help promote proper WASH behaviour of HCWs. In order to understand as whether the high surgical site infections is correlated with the WASH practices and knowledge of the healthcare workers, and if the WASH facilities encourage proper WASH behaviour, we conducted this study. Methods: This was an observational case study. Two populations were studied: the patients and the healthcare workers at MOI. After a surgical wound has been declared infected, it was swabbed and cultured for microbial growth. The data was recorded in the data sheet.

Inorganic nanopesticides; Environmental fate, distribution and toxicity in South Africa water system – NIMR Tanga

Overall objective: This study aims to contribute scientific knowledge on the occurrence and distribution of the nanopesticides formulations, their environmental fate and toxicity to aquatic organisms in water system in South Africa. Specific Objectives: 1. Develop an analytical, bioanalytical and biochemical methods for the extraction and determination of selected nanopesticides in aquatic ecosystem using a combination of different analytical techniques 2. Identify the toxicity effects of the

selected nanopesticides to aquatic organisms particularly on fish 3. Investigate the biochemical changes that occurs in aquatic organisms particularly fish 4. Investigate the stability and mobility of the nanopesticides in aquatic environments and 5. Examine the occurrence and distribution of the nanopesticides in different water system.

6.10 HEALTH TECHNOLOGIES

Designing Multiplex Rapid Diagnostic Test Platforms for Health-related Point-of-Care Applications in Developing World – NIMR Tanga

Overall objective: To design, develop and evaluate low-cost multiplex test platforms for diagnostic applications in developing world. Specific Objectives: 1. To review the challenges in diagnosis of febrile illnesses in Tanzania in the era of declining malaria 2. To design multiplex double-antibody sandwich immunochromatographic lateral flow platforms for point-of-care (POC) diagnostics 3. To design a thread-on-tape multiplex colorimetric device for detection of important health biomarkers 4. To design a thread-on-tape immunochromatographic test for point-of-care detection of infectious diseases 5. To assess short-term stability/viability of thread-on-tape devices under ambient tropical conditions. Methodology: The device platforms were designed using fibreglass pads, chromatography paper and nitrocellulose membrane. Chromatography paper and fibreglass were used as sample and conjugate pads while nitrocellulose was used as capture membrane. Three different designs are described in this paper. The designs were tested by assembling a device capable of simultaneous detection of *Helicobacter pylori* (bacteria), Hepatitis B viral antigen S (virus) and Human Immunoglobulin G. These designs were evaluated by developing a test for glucose, proteins and uric acid in urine (colorimetric), as well as *Helicobacter pylori*, Hepatitis B virus surface antigen and Immunoglobulin G (immunochromatographic) in blood samples.

6.11 HEALTH SYSTEMS AND POLICY RESEARCH

Access and Delivery Partnership: Pathway Two – NIMR Headquarters

The project focuses on enhancing capacity to identify and address country-specific health system needs for effective access and delivery of new health technologies. The main objective is to enable the diseases control programmes, public health research institution and healthcare services providers to use Implementation research as an important strategy in the identification of the country-specific needs and patients' perspectives on innovative technologies required to improve the provision of healthcare services in the country. It further aims at institutionalizing Implementation Research in Tanzania. Objective: Strengthening of an integrated approach to enhance Access and delivery of health technologies.

Needs Assessment for Rheumatic Heart Disease in Sengerema District – NIMR Mwanza

Objectives: (1)To map patient care pathways for sore throat and Rheumatic Heart Disease (RHD) in Sengerema district (2)To determine the burden of sore throat and factors associated with this condition in the study population (3)To determine service readiness and quality of care for streptococcal sore throat and RHD in the study area (4)To explore knowledge and perceptions on aetiologies, symptoms and treatment pathways for sore throat and RHD in the study area (5)To assess treatment seeking behaviour including how lay-beliefs affect general treatment seeking behaviour and treatment seeking practices for patients with sore throat and RHD (6)To assess health workers skills and experience to diagnose, care and manage streptococcal sore throat and RHD.

Situation analysis on Human Resources for Health (HRH) in Zanzibar - NIMR Headquarters

The main objective of this study was to analyse policy context with regards to Reproductive Maternal Neonatal and Child Health (RMNCAH) workforce and critically assess the current human resource for

health needs in the area of Reproductive Maternal Child and Adolescent Health (RMNCAH) with a view to explore on the availability, current level of shortage, constraining factors on retention of RMNCAH workforce and make recommendations at policy and programme levels. Mixed methods approach was employed including documentary review and key informant interviews from national, regional, district and facility levels both for Unguja and Pemba.

Towards sustainability of Schistosomiasis Control: improving health of lake shore communities and engaging civil society structures, educational and health facilities in the hyper-endemic area of Mwanza, Tanzania – NIMR Mwanza

A sustainable schistosomiasis Control project has been implemented in Illemela and Nyamagana district of Mwanza city since September 2017. Following the baseline survey several interventions have been carried out in Illemela and Nyamagana district as part of the planned project activities. Such interventions include; Joint meeting/Development of MoU with Educational sector, selected test and treatment campaigns, selection and training of CDDs, Mass Drug Administration (MDA) campaigns without prior testing and, information campaigns in highly affected communities. Others were the training workshops for laboratory personnel, Clinicians and sonographers, children Hygiene and Sanitation training (CHAST) & peer education, and for multipliers.

6.12 RESEARCH ON SOCIAL DETERMINANTS OF HEALTH

AnthroTox. Combining natural and social sciences to understand and manage global anthropogenic toxicants - NIMR Amani

AnthroTox brings together social anthropologists, Africanists and social students of science, and environmental toxicologists, in order to understand how environmental and social processes and their relationships dictate flows and impacts of anthropogenic toxicants across societies and ecosystems, to explore the social, political-economic and historical context of global toxicants, and to contribute to public debate, political process and remedial action.

In its initial phase, AnthroTox focuses on organic pollutants and attendant social processes related to electronic waste in Tanzania (Dar-es-salaam and Zanzibar), East Africa. This work will serve to build a sustainable interdisciplinary foundation for future collaborations on global anthropogenic toxicants, between anthropologists and other humanities, and the social and natural sciences.

Difficult Decisions: Rural livelihoods, children's work and parental investment in education in north-western Tanzania – NIMR Mwanza

Objectives: To collect data to investigate trade-offs between children's education and work activities in Kisesa and Welamasonga villages. The study involved household surveys in 400 households (200 per village). The household survey included a household roster, a socioeconomic module collecting information about household livelihood and assets, a food security module, and an education attitudes module. For each child in the household aged between 7 and 19, a survey was also completed with information about their parents, siblings, and education. Then each child was interviewed about their work activities, and their time allocation during the previous day.

6.13 TRADITIONAL AND ALTERNATIVE MEDICINE RESEARCH

Isolation of active ingredients from TASHACK herbal drug as a quality control approach – NIMR Headquarters

The TASHACK herbal remedy is famous and highly utilized in Tanga region as a complementary or main treatment for HIV/AIDs. Clinical validation of the remedy is in progress and that, we found it pertinent to isolate and identify the active ingredients in the remedy. We have carried out chromatographic fingerprinting of the TASHACK herbal remedy to provide an evidenced guide for method development

for chromatographic isolation of active ingredients. Chemical fingerprints obtained by chromatographic techniques are strongly recommended for the purpose of quality control of herbal medicines, since they might represent appropriately the “chemical integrities” of the herbal medicines and therefore be used for authentication and identification of the herbal products. Based on the concept of phyto-equivalence, the chromatographic fingerprints of herbal medicines could be utilized for addressing the problem of quality control of herbal medicines.

Formulation of NIMREGENIN, *Annona muricata* extract for the management of cancer and related complications - NIMR Headquarters

Annona muricata L. (*Msitafeli* as commonly known), is a medium-sized tree, which belongs to the Annonacea family and contain high antioxidant and anticancer compounds. The leaves are rich in annonaceous acetogenins, the most potent anticancer compounds. Acetogenins are polyketide-derived fatty acid with tetrahydrofuran rings and methylated gammalactone bonded together and composed of a large family of fatty acid derived-natural products with unique structures like saturated and unsaturated aliphatic compounds with oxygenated functional groups. Acetogenins are well known for their bioactivities as antioxidants, antitumoral, anticarcinogenic, cytotoxicity, antiparasitic, and pesticidal activities. Nowadays, it has become well-known globally for its anticancer properties due to the several studies done on few cells like pancreatic cancer, cervical cancer, breast cancer and prostate cancer. Due to its high market demand as anticancer supplement product, it has been seen among the potential herbs that can be formulated and popularized for the management of cancer and its complications. Objective: The present study aimed to formulate and produce NIMREGENIN herbal anticancer drug from *Annona muricata* leaves.

6.14 EVALUATION RESEARCH

Baseline data collection for an impact evaluation of the cross-border health integrated partnership project (CB-HIPP) – NIMR Mwanza

The overall CB-HIPP impact evaluation work used a quasi-experimental design in which outcomes of interest was compared between a set of intervention sites and matched comparison sites. The evaluation team was prospectively collected quantitative and qualitative data on the intended health outcomes of the program. Information on the health outcomes was gathered at 3 time points: baseline, midline, and endline.

HIV Health Demographic and Health Surveillance System (HDSS) - NIMR Mwanza

The study monitors vital demographic events in Kisesa ward in Magu district. Data collection is done on biannual basis and done by resident field workers who reside in the respective villages. The objective is to monitor HIV trends in Kisesa Ward. The study involves setting-up a temporary clinic in each of the six villages of Kisesa Ward and eligible participants (15 years+) sent invitation by the field workers of the Demographic Surveillance system. At the clinic, each participant is registered, interviewed and provides blood (through finger prick) for HIV testing. Treatment is offered if there are health complaints. In addition, those who wish to know their HIV status are offered VCT services as per the guidelines of the ministry of Health, Community Development, Gender, Elderly and Children. Research samples i.e. Dry Blood spots (DBSs) are taken to the NIMR laboratory for quality control and storage.

Rapid assessment on the feasibility of integrating HIV and NCD services: patients and community health workers perspectives – NIMR Muhimbili & NIMR Headquarters

Disease epidemiology has changed rapidly in Africa. Alongside the continuing high burden from HIV-infection and other infections, diabetes, hypertension and other NCDs have risen sharply in Africa.

Most of the studies done to describe the burden of NCDs have used weak study designs but it now is clear that diabetes alone has a prevalence exceeding 5% in adults and the figure for hypertension is over 20%. Close association between HIV and NCD has been revealed but each programme operates independently. Stand-alone chronic care models are often not sustainable and are costly to the patients with co-morbidities because of movement to several clinics to access care. It is therefore important to propose an integrated HIV/NCD care services for all patients with any of the three conditions (HIV, hypertension and diabetes). A rapid assessment was therefore conducted to document the acceptability and feasibility of integration. A total of four focus group discussions were conducted of which two were from Amana regional hospital (hypertensive clients and peer educators) and two were from Bunju Dispensary (HIV clients and home-based care focal persons). The aim was to get views, perceptions and opinions on how best integration can work. Integration focuses on HIV, hypertension and diabetes.

National Anti-Tuberculosis Drug Resistance Survey (DRS) in Tanzania, 2016/2017 – NIMR Muhimbili

One of the aims of ensuring effective management of tuberculosis (TB) is to minimize the development of drug resistance. Surveillance of anti-TB drug resistance is therefore an essential tool for monitoring the effectiveness of the TB control programs and improving national and global TB control efforts. In the absence of robust routine surveillance system, the best way to obtain the magnitude and trends of drug resistant TB is to perform surveillance based on internationally standardized criteria. This will ensure that the results are comparable between countries as well as within countries over time. This is a collaborative study between the NTLP and the National Institute for Medical Research (NIMR). An estimated 1,495 of newly diagnosed smear positive TB patients will be enrolled from 45 clusters. Enrolment of patients and collection of sputum samples will last for a period of 12 months. The survey will provide information on the prevalence of anti-TB drug resistance pattern among new and previously treated TB patients in Tanzania. It will also contribute to a better estimate of the global burden of multidrug-resistant tuberculosis (MDR-TB) and extensively drug resistant tuberculosis (XDR-TB).

6.15 CROSS-CUTTING ISSUES

NIHR Global Health Research Group on the prevention and management of HIV-infection and non-communicable diseases – NIMR Muhimbili. HIV, diabetes and hypertension are major determinants of the massive and rising burden of communicable and non-communicable diseases in Africa and provision of accessible effective care for these conditions is probably Africa's biggest health challenge. The group will build a programme of research to define integrated approaches for the prevention and management in HIV, diabetes and hypertension that are suitable for the local context of limited health staff and resources and the challenges that patients face in accessing care. The studies will be designed to provide reliable data on both the benefits and potential challenges of integration so that we can choose which research areas to prioritize. The data will be used to design the subsequent large-scale research studies and also to develop the research skills of staff including in study design, statistical analysis, paper and proposal writing among research staff. Data and estimated potential cost-effectiveness of different approaches will be modelled. The vision is that future studies will be large-scale comparative studies evaluating different approaches of prevention and management for major chronic conditions.

6.16 COMMUNITY ENGAGEMENT IN RESEARCH

Social science and Community engagement – NIMR Mbeya

Community engagement (CE) is considered as a vital and indispensable part of research activities. It is also perceived to be an ethical requirement for research involving communities. A community advisory board (CAB) has been established since 2005 that works independently to bridge research staff and communities across research studies, provides feedback on community perspectives of trials as well as assist in management of rumours. Objectives are to (i) to raise community awareness on research activities taking place at the centre (ii) to increase engagement and interactions between researchers and relevant stakeholders hence establishing trust and sustained networking (iii) to ensure dissemination of research findings to relevant stakeholders including policy makers and communities (iv) to recruit and maintain high participant retention in different studies taking place at the centre (v) to minimize and manage rumours and misconceptions about research activities in the community (vi) To conduct health related qualitative studies. Methods: Several activities are implemented to ensure engagement of targeted communities, government leaders and study specific participants with research studies conducted at the site. Some of these activities are conducted in collaboration with CAB and existing government and community leadership structures. Multiple activities are sometimes conducted concurrently to enhance awareness of research studies particularly during recruitment phases. These engagement activities include sensitization meetings with government and community leaders; study specific briefing sessions and information seminars; media engagement activities such as live/recorded radio sessions, television, and press conferences; participation in public events e.g. World TB day, HIV/AIDS day; distribution of study specific information, education and communication (IECs) materials and bi-monthly Community Advisory Board meetings.

6.17 TECHNICAL SUPPORT AND CAPACITY BUILDING

Support for Development and Maintenance of the National Health Facility Registry

The Geographic Information Systems (GIS) Unit at NIMR provides technical and expertise support in development and maintenance of Health Facility Registry System hosted at the Ministry for Health, Community Development, Gender, Elderly and Children. During the reporting period, the unit facilitated training on health facility registry (HFR) system to new Councils, Zonal and National Level Hospital staff, members from Directorate of Curative Services of the Ministry of Health, Community Development, Gender, Elderly and Children and Public facility Advisory Board. The training aimed at improving data quality in the Health Facility Registry system.

Capacity Building on Use of Geographic Information Systems (GIS) to Ministries, RHMT and CHMT

The GIS Unit conducted training on Geographic information system to select President's Office Regional Administration and Local Government, Ministry of Health, Community Development, Gender, Elderly and Children, Regional Health Management Team (RHMT) and Council Health Management Team (CHMT) staff with the aim of empowering them to use GIS as a tool for planning, monitoring and evaluation of different programs and interventions. The topic covered include Global Positioning System (GPS), basics for location data capturing, application of GIS in health, fundamentals of GIS and Terminologies, Data sources of GIS, QGIS software installation and Interface, and map production. Sixty-one (61) health officials from regional and council levels have participated. Among these, 54 were from 27 councils, 2 were from regions and 5 were from national level.

Mobile Diagnostic and Training Centre (MDTC) - NIMR Mbeya

The Mobile Diagnostic and Training Centre (MDTC) is implementing Government programmes, offering HIV services among the key and vulnerable populations (KVPs) and priority populations (PPs) in Mbeya and Songwe region. Objectives: (i) to provide HIV Testing and Counselling (HTC), Cervical cancer screening, TB screening and linkage to care among key populations and priority population; (ii) to give health education to the community members using video/film shows in the evenings. The video/film shows focus on HIV/AIDS, Sexually Transmitted Infections and Tuberculosis - how to recognize them, prevention, importance of early diagnosis and treatment. Methods: The clients attending the MDTC are recruited from their respective place of work or neighbourhood in the outreach sites. MDTC staffs approach the respective group using either an identified peer educator, outreach partner, bar owner or directly in areas where there is no peer educator identified. Services offered included health education on predisposing factors, screening for STI, TB, HIV, Cervical cancer screening among KVPs and PPs. In addition, the centre collaborates with the Mbeya Zonal Referral Hospital and Baylor Paediatric Clinic in diagnosing TB in suspected children.

7.0 DISSEMINATION AND UTILIZATION OF RESEARCH FINDINGS

NIMR scientists and collaborators published 96 manuscripts in peer-reviewed journals, as technical reports, policy briefs and book chapters (**Appendix 3**).

Other major dissemination activities during the reporting period are:

International Workshop on Infection Prevention and Control 2017: Technical research workshop on IPC/WASH in healthcare facilities held in Arusha 25th - 27th September 2017

For the first time, Tanzania hosted the international workshop on Infection Prevention and Control (IPC) with emphasis on the need for improves Water Supply, Sanitation, and Hygiene (WASH) services in Healthcare Facilities (HCFs). The workshop was organized jointly by the National Institute for Medical Research (NIMR), the Ministry of Health Community Development Gender, Elderly, and Children in collaboration with the Infection Control Africa Network (ICAN).

With about 40% of healthcare facilities lacking improved water, and nearly 20% without improved sanitation, WHO, UNICEF and partners committed to address the situation at a global meeting, with the aim of achieving universal access in all facilities, in all settings by 2030. Furthermore, the WHO/UNICEF Joint Monitoring Programme committed to reporting on access to WASH in health care facilities as part of monitoring the Sustainable Development Goal on Water and Sanitation. The IWIPC 2017 in September 2017 presents a timely moment to reflect on progress of the action plan implementation in Africa and strategically adjust efforts towards achieving the set targets.

Goal and Objectives: To convene relevant stakeholders (clinicians, Nurses, Scientists, Researchers, Environmental Health specialists and donors) to share experience, foster collaboration and evaluate emerging approaches and technologies across the globe. The workshop deliberated on WASH in healthcare facilities and the latest advances in the prevention of healthcare-associated infections and control of antimicrobial resistance (AMR). Key workshop outcomes: 1. The workshop brought together a total of 150 participants; IPC and WASH practitioners, experts, and leaders from Tanzania, other African countries, the Netherlands, Korea, and United States of America. 2. Thirty (30) scientific presentations were delivered and discussed 3. Introduction and inauguration of the local IPC/WASH practitioners' network (TWIN) was launched in the course 4. Workshop recommendations.

Hospital Mortality and Causes of Death in Tanzania Study: Dissemination Workshops

The National Institute for Medical Research conducted a study on hospital mortality in Tanzania. This study carried out in 2016 covered a period of 2006-2015. Following accomplishment of the study, it was agreed that the findings be disseminated to a wider audience including practitioners, researchers, policy makers and development partners. The research dissemination workshops with the theme: "Hospital Mortality and Causes of Death in Tanzania" were held in Dar es Salaam, Morogoro, Dodoma, Mbeya and Mwanza from July to September 2017. The objectives of the workshops were to: (i) present the research findings on the availability quality of hospital mortality data; and (ii) described the trends in hospital mortality patterns in Tanzania from 2006-2015. In each workshop, the presentations highlighted the key findings and recommendations and provided a forum for discussions and development of operation plans to address the identified gaps. Also included in these proceedings is a summary of research findings, opening speeches and participants' discussion, developed operational plans. Drawing on the research findings and their own experiences, participants identified activities to improve future hospital data management and patient care. The 134 workshop participants were drawn from a wide variety of institutions including: the Ministry of Health, Community Development, Gender, Elderly and Children, President's Office Regional Administration and Local Government; Registration, Insolvency and Trusteeship Agency, Zonal and Regional Referral Hospitals, District Hospitals and Specialised Hospitals. Others included the World Health Organization, Centres for Disease Control and Prevention, United States Agency for International Development, Global Funds

for AIDS, Tuberculosis and Malaria and the Media. Over the course of two-day interactive meetings, with discussions within and between groups, the participants systematically examined the gaps in data management, causes of death and patient care that might influence the planning and delivery of better inpatient care with reference to the findings of the report presented. At the end of the workshops, the participants envision that the report recommendations will be utilized as a reference to their future plans to improve data management and patient care.

Production and Distribution of the Human Resource for Health (HRH) Newsletter

This is a newsletter of the Ministry for Health on issues pertaining to Human Resources for Health. NIMR is the Secretariat for the newsletter and is responsible for its production. Distribution of 1200 copies of the 14th HRH Newsletter was done to various stakeholders including RMOs, DMOs, Heads of Health Training Institutions and development partners.

Tanzania Journal of Health Research

The Institute disseminates general information on health research through its quarterly published Tanzania Journal of Health Research. The Journal was established in 1997 was initially published as the Tanzania Health Research Bulletin before 2007. In this quarter, volume 19 issues 3 & 4 and volume 20 issues 1 & 2 was published (**Appendix 4**).

8.0 APPENDICES

8.1 Appendix 1: List of research proposals for ethical clearance processed from July 2017 to June 2018

71. Evaluation of the immunization data initiative in Arusha and Kilimanjaro regions (Msuya S et al)
72. Understanding constraints and enablers of turn-around time for ethics review: The case of Institutional Review Boards (IRBs) in Tanzania (Mrisho M et al)
73. Understanding the health and disability of traumatic brain injury patients at Kilimanjaro Christian Medical Center (Mvungi M. et al)
74. A pilot study of the effectiveness of screening and treatment of children with severe acute malnutrition by community health workers (Lorusso V et al)
75. Quality, efficacy and acceptability of ready to use supplementary foods for rehabilitating moderately acute malnourished child (Swai L D et al)
76. Baseline assessment of surgical capacity in Tanzania (Maongezi S et al)
77. Creating low repellent treated sandals that provide round the clock protection against mosquito-borne infections (Finda M et al)
78. Integration of primary eye care for children into primary health system in Tanzania: Development and evaluation of a health module for inclusion in the integrated management of child hood illness training program (Malik A et al)
79. A verbal/social autopsy to improve estimates of the causes and determinants of neonatal and child mortality in Tanzania (Meku S et al)
80. Impact evaluation of Tanzania's Public Sector Systems Strengthening (PSSS3) project (Kwesigabo G et al)
81. Evaluation of the implementation of national WASH guidelines in healthcare facilities (HCF) in Tanzania (Massa K et al)
82. Formative research to the design on the national sanitation and hygiene campaign in Tanzania (Curtis Val et al)
83. Assessment of Mwanzo Bora Nutrition program behavior change communication interventions (Bonaventure M et al)
84. Household welfare dependence on ecosystem services work package 5 in the EU Horizon 2020 project African Bio-services (Ntalwila J et al)
85. Better accountability to stop ill treatment, improving patient experience during sick child visits by leveraging community voices to hold health systems accountable (BASI) (Mbatia R et al)
86. Operations research on the optimal package and process of integrated health care (Mbuguni M et al)
87. Nutrition-sensitive home-stead food production project in Rufiji district, Tanzania (Masanja H et al)
88. Strengthening health systems for the application of policy to enable universal test and treat (SHAPE-UTT study) (Metta E. et al)
89. The Banana project (Ebitu A.K.S et al)
90. Developing capacity for pediatric cancer clinical research in Tanzania (Schroeder K. et al)
91. Child poverty in Tanzania (Kabalika G. et al)
92. Improving the implementation and outcomes of the Ministry of Health Community Development, Gender, Elderly and Children (MOHCDGEC) efforts supported by I-TECH Tanzania (Chale S. et al)
93. Impact of SMS advertising on participation in mass vaccination campaigns and consequences for control in Tanzania (Changalucha J. et al)
94. Older age disability in humanitarian crises (Smart D. et al)

95. The political and social implication of sickle cell diagnosis in 21st century Tanzania: An ethnography of an emergent genetic health priority (Ciribassi R. et al)
96. Peri-domestic behavior of african vectors and the impact of insecticides (Manjurano A. et al)
97. The 2017 Tanzania Malaria Indicator Survey (2017 TMIS). (Chuwa A. et al)
98. Assessing the intrinsic drivers and targeting the observed resilience of malaria at selected sites in mainland Tanzania (Ishengoma R.S. et al)
99. Assessing capacity of health system for sustainable of african human trypanosomiasis (HAT) in western Tanzania (Manangwa O et al)
100. Evaluation of the prevalence and dynamics of plasmodium among public primary school pupils in Tanzania (Chacky F et al)
101. Operationalization of task sharing policy to high HIV volume sites: The key to meeting 90-90-90 HIV and AIDS goals (Mashauri P. et al)
102. Effect of reminder cues and tailored feedback on adherence to antiretroviral drug treatment among people living with HIV in the Kilimanjaro region, Tanzania (Sumari de Boer et al)
103. Screening for arboviruses from febrile patients and mosquitoes in Kilombero valley, South Eastern Tanzania (Chipwaza B. et al)
104. Planning among female sex workers living with HIV in Tanzania (Apicella L. et al)
105. Evaluation of an initial phase HIV/TB integration in MDH supported methadone assisted therapy (MAT) clinics, Dar es salaam Tanzania (Ulunga N et al)
106. Mobility patterns and feasibility of tracking women at high risk of HIV in fishing communities of lake victoria in Tanzania (Kapiga S et al)
107. Understanding and responding to HIV related stigma and discrimination in the perspective of health facility staff and clients in selected Facilities in Morogoro region, Tanzania (Ezekiel M J et al)
108. Genomic and immunopathological differences between human and non- human primate treponemes: Simian strains as a mission link to understand syphilis's Evaluation (Mfinanga S. et al)
109. Durable, practical, effective and affordable formats for insecticide treated bed nets that protect households and suppress malaria transmission. (Okumu F. et al)
110. Concerning and understanding our microbial heritage worldwide compositional and functional variability of bacterial communities living in the gut of humans (Mabulla A. et al)
111. Role of wild animals in the transmission of brucellosis in humans and livestock in Serengeti ecosystem, in Tanzania (Mkula S. R. et al)
112. Molecular epidemiology of bacillus anthracis (MEBA) capacity data and techniques for local surveillance in Ngorongoro conservation area, Tanzania (Mmbaga B. et al)
113. Measuring under-diagnosis of childhood pneumonia in Tanzania (Massaga J et al)
114. Identifying and matching individuals' preferences for HIV/AIDS counseling and testing (IPACT) (Njau B et al)
115. Piloting an innovative, low cost, feasible and highly sensitive stool - based diagnostics test for children with presumptive TB in Mbeya, Tanzania (Bacha J et al)
116. A qualitative study of the perceived risk of Tuberculosis transmission among health care workers in Dar es Salaam in Tanzania (Mbawala W et al)
117. Is Zoonotic bacterial infections a major cause of non-malarial febrile illness: A cross sectional study in Korogwe district Tanga region, North-Eastern Tanzania (Minja T R et al)
118. Creating awareness of childhood cancer a Tanzania grass roots approach (McHenry K. et al)
119. Malnutrition and associated factors among children under-five in Tanzania (Pess J. L. et al)
120. The trial to establish casual linkage between mycotoxin exposure and child stunting (Kassim N et al)

121. Delivery of clean air strategies for mitigating household air pollution and associated respiratory illness in urban informal settlements in Dar es Salaam Tanzania and Lilongwe (Magitta N. et al)
122. Tracer study on budget allocation for reproductive and child health by council comprehensive health plans (Abel Z et al)
123. Antiretroviral therapy and prevention of mother to child transmission rapid data quality assessment in Tanzania (Said C et al)
124. Assessment of regional of facility level maternal and prenatal death surveillance and response (MPDSR) systems in 4 sub-saharan african countries (Sunguya B et al)
125. A dose reduction immune-bridging and safety study of two HPV vaccines in Tanzania girls (DORIS trial) (Changalucha J. et al)
126. Supporting systems to improved maternal, newborn, and child health (SUSTAIN), Kigoma region: A baseline survey (Manongi R. et al)
127. Applying human centered to understand the user, and develop new innovative service channels to drive uptake of family planning /SRH service among adolescents in Tanzania (Ntinginya M. et al)
128. Effect of climatic and environmental change for pregnant women and their offspring (A registry-based study (Mmbaga B. et al)
129. Implementation research for maternal immunization program in Dar es Salaam, Tanzania: Acceptability for mHealth (Mobile-Health) program and willingness to pay for maternal pertussis immunization (Nkundu D. et al)
130. Evaluation of behavior change of midwives in six weeks after introducing early essential newborn care at Muhimbili National Hospital, Dar es Salaam, Tanzania (Fukutomi R. et al)
131. School dropouts and health- promotion campaigns in Tanga region, Tanzania (Dalsmo I. E et al)
132. Support groups for HIV + adolescents in Tanzania: A pilot study (Antelman G. et al)
133. Analysis of barriers in maternal and newborn health program in developing countries (Minah Kang et al)
134. Exploring the use of safe delivery for improving provision of care for maternal and newborns health in Mpwapwa district, in Dodoma Tanzania (Shamba D et al)
135. Exploring mothers' knowledge of and experience in newborn care education at Muhimbili National Hospital, Dar es Salaam (Kohi T et al)
136. Evaluation of the management and development for health HIV/AIDS care and treatment program in Dar es Salaam, Tanzania (Ulenga N et al)
137. Cash transfers for adolescent girls and young women to reduce sexual risk in Tanzania: A qualitative and behavioral economics assessment of participants in the Sauti study (Wamoyi J et al)
138. Evaluation of the impact of the adolescent 360 on the reproductive health girls in Tanzania (Kapiga et al)
139. Baseline survey for safe motherhood (UZAHI) Salama project in Rukwa region (Mbuyita S et al)
140. Gender based challenges in leadership: Prevalence, characteristics, and strategies for promoting women in the health sciences in Tanzania (Downs J A et al)
141. An mHealth strategy to reduce preeclampsia, partum hemorrhage and infant deaths in Tanzania (Mbaruku G et al)
142. Experience of contraceptive use among young adults and knowledge of mHealth service provider on HIV/AIDS prevention and care in Arusha (Masatu M et al)
143. Shifting sexual identities among gay men in Dar es Salaam Tanzania in the age of mass HIV treatment (Shio J M et al)
144. The silent voice of the midwife managing neonatal resuscitation in limited clinical settings: A study into the practice of midwives in sub-Saharan Africa. (Becker J C et al)

145. Capability, opportunity, and motivation for improved hand hygiene: A qualitative study to support a school-based hand washing intervention for helminths infection control in Kagera region, Tanzania (Okello E S et al)
146. Market research for private PMTCT services and HIV self test kits in Tanzania (Antelman G et al)
147. Diagnostic accuracy and applicability of molecular approaches for the detection of *Schistosoma* DNA in human blood and urine samples pretreatment (Mueller A et al)
148. Using field epidemiology to evaluate local HIV care and treatment programs in Tanzania (Chale S et al)
149. Developing and maintaining Kilombero and Ulanga anti-retroviral cohort (KIULARCO) at SFRH in Ifakara, Tanzania (Weisser M et al)
150. SPLAT- BAC: An efficient insect vector control solution (Mboera L et al)
151. Randomized clinical trial comparing intramedullary kirchner-wire to flotation of pediatric femur fractures (Ndalama E et al)
152. Incentive in a community base mobilisation programmes for family planning understanding drivers of mobiliser performance in Tanzania (Pembe A et al)
153. Assessing the relationship between livestock presence and malaria vector species variation among Tanzania households (Littleton A et al)
154. Stress, coping and health among adolescent girls and young women in Tanzania (Mowo F. et al)
155. The association between parent/guardian education and nutrition status of children under five in Korogwe, Tanzania (Smith RJ et al)
156. Prevalence of surgical site infections and the relationship to WASH knowledge and practices of healthcare workers and WASH facilities in the orthopaedic institute of Muhimbili National Hospital in Dar es Salaam (Hinson C et al)
157. Observing WASH facilities and practices and testing for neonatal sepsis associated pathogens in the Muhimbili National Hospital labour ward (Housman EG et al)
158. Associations between gestational age and maternal anaemia in rural Tanzania: A retrospective study of risk factors for uterine atony and postpartum haemorrhage (Kelly H et al)
159. Evaluation of presumptive periodic treatment (PPT) of sexually transmitted infections (STIs) among high-risk populations including men who have sex with men female sex workers (FSW) and mining populations in Tanzania (Shao A et al)
160. Impact of integrated HIV/ NCD screening on HIV testing uptake and engagement in HIV care: An RCT in Kisarawe, Tanzania (Mbwambo J et al)
161. Doxycycline 200mg/d vs. 100mg/d for 6 weeks to improve filarial lymphedema a multinational, double-blind, randomized, placebo-controlled trial (Mwingira U et al)
162. A phase 2b Study to evaluate the safety and efficacy of VRC01 broadly neutralizing monoclonal antibody acquisition of HIV- Infection in women in sub-Saharan Africa HIVTN 703/HPTNo.81 (Maganga L et al)
163. Clinical trial to evaluate the safety, immunogenicity and efficacy of direct venous inoculation of two plasmodium falciparum sporozoite based vaccines (PfSPZ – Cvac and PfSPZ vaccine) in HIV negative and HIV positive Tanzania adults (Jongo S et al)
164. Surveillance of brucellosis for community-based disease prevention and control in Tanzania using a one health approach (Kazwala R et al)
165. Mobile phone monitoring survey of malaria vector control coverage (MOMonVEC) (Chacky F et al)
166. Evaluation of a comprehensive platform for integrated communication initiative in Tanzania (Msofe J et al)

167. Serum methadone levels among heroin dependent patients undergoing treatment for tuberculosis and/or human immunodeficiency virus co-infection in Dar es Salaam (Sanga A et al)
168. Community and provider driven social accountability intervention (CaPSAL) study (Geubbels E et al)
169. Performance of microbiology laboratories for identification of pathogenic bacteria and their in-vitro antibiotic resistance pattern in selected hospitals in Tanzania (Kimaro G et al)
170. Prospective evaluation of the AMREF health Africa a Uzazi Uzima Project for reproductive, maternal, new-born, and adolescent health in Simiyu region, Tanzania: Assessment of changes in coverage (Ngilangwa D et al)
171. Traumatized refugee families consequences for mental health and psychosocial functioning in children and adults (Scharpf F et al)
172. Cash transfer for adolescent girls and young women to reduce sexual risk in Tanzania: A qualitative and behavioral economics assessment of participants in the Sauti study (Wamoyi J et al)
173. Availability and utilization of BEmONC services to all health centers within 5 BRN regions of lake and western zones (Kilima S et al)
174. Monitoring ITN ownership coverage targets in Tanzania at regional level using lot quality assurance sampling (Kahwa A et al)
175. The impact of intermittent preventive strategies in reducing malaria related morbidities and improving cognitive ability in school aged children: A neglected control domain with a considerable development impact (Makenga G et al)
176. Pilot study on implementation of emergency care services for maternal and neonatal care in the lake region of Tanzania (Rumanyika N et al)
177. Level and cause of loss to follow-up among patients at a rural care and treatment clinic (CTC) in Mwanza Tanzania (Bettencourt et al)
178. Adherence to antiretroviral treatment among HIV positive antenatal and postnatal women in rural Mwanza, Tanzania (Celeta C et al)
179. The effects of micronutrient supplements on breast milk vitamin B-12 status and childhood morbidity in Tanzania (Lweno O et al)
180. Efficacy and safety of artemether-lumefantrine for the treatment of uncomplicated falciparum malaria in mainland Tanzania (Ngasala B et al)
181. Final performance valuation for the women in law and development in Africa, Tanzania project (WILDAF), USAID/ Tanzania (Amenye E et al)
182. Baseline study for improving food and nutrition security project in Dodoma and Singida regions, Tanzania (Kwesigabo G et al)
183. Strengthening scientific for preparedness and response to viral hemorrhagic fevers in Tanzania (Mboera L et al)
184. An ethnographic study of companionship during childbirth: power relations and social dynamics in communities and health facilities in Kigoma, Tanzania (Strong A et al)
185. Molecular diagnostics approach for optimizing clinical management of multidrug resistant tuberculosis: A strategy for improving treatment outcome in Tanzania (Mbelele M et al)
186. A phase IV randomized trial to evaluate the virologic response and pharmacokinetics of two different potent: Regimens in HIV infected women initiating triple antiretroviral regimens between 20 and 36 weeks of pregnancy for the prevention of mother – to child transmission: NICHD P1081 version 3.0 dated 2 April 2015 (Mmbaga B et al)
187. Valuation of scan access ultrasound services program at reproductive health clinics in Dar es Salaam region (Mfinanga S et al)

188. Evaluation of surgery 2020 interventions in Tanzania (Maongezi S et al)
189. Evaluation of the implementation of the HIV combination prevention campaigns in mainland, Tanzania (Urassa P et al)
190. Mosquito borne emerging diseases: Trends, surveillance and risk modeling (Mboera L et al)
191. Cost analysis of amputation at a major public hospital in sub-Saharan Africa (Haonga B et al)
192. Evaluating the impact of text messages without community support groups on maternal, infant, and child nutrition practices in Tanzania (Kaganda J et al)
193. To determine the burden of HIV drug resistance among HIV infected pregnant women in Tanzania (Ulenga U et al)
194. Malaria during pregnancy and child mortality/ morbidity in Tanga (Chiduo M et al)
195. Anopheles funestus gene flow studies and rearing methods (Govella N et)
196. Impact of postpartum IUD insertion on the quality, duration and risk of infected lochia discharges in Tanzania (Muganyizi P S et al)
197. Optimizing the efficacy and implementation of cash transfers to improve adherence to antiretroviral therapy (Njau P et al)
198. Assessment of early childhood development in Mbozi district: Tuwekeze Pamoja (Massaga J et al)
199. Unnecessary use and misuse of cesarean an section in low resource settings (Vartdal V et al)
200. Defining and testing health systems governance implications on health services provision in Tanzania and Ghana (Metta E et al)
201. Global access to medicines in the 21st century: A survey of regional and country perspectives (Odoch W et al)
202. Effects of the regional complementary pharmaceutical supply system on improving access to medicines in Dodoma region, Tanzania (Kuwawenaruwa A et al)
203. Evaluating conditional cash transfer to prevent HIV and other sexually transmitted infections (STIs) in Tanzania a randomized evaluation of RESPECT II (Balampama M et al)
204. Formative research for effects: Engaging fathers for effective care for young child nutrition and development in Tanzania (Kieffer M P et al)
205. Formative assessment and size estimation for TB vulnerable population minors in mining areas in Chunya, Mbeya Region Tanzania (Mleoh L et al)
206. Affordable, scalable, low technology transfluthrin emanators for protecting against transmission of Zika, Dengue and Chikungunya viruses (Govella N et al)
207. HIV prevention using HIV testing and oral exposure prophylaxis (PrEP) (Lija G et al)
208. The costs of vaccine delivery strategies to reach children up to 18 months in rural and urban areas in Tanzania (Manzi F et al)
209. Evaluation of viral load turn around time Moshi municipal, Kilimanjaro region, Tanzania (Muro E et al)
210. Febrile illness surveillance in northern Tanzania (Maro V et al)
211. Assessing the surgical patient safety culture in Tanzania (Maongezi S et al)
212. Developing model for the sustainability and scale up of quality improvement teams in the regional referral hospitals in Tanzania (Kacholi G et al)
213. Implementation and impact evaluation of the willow's reproductive health program in Arusha (Msuya E et al)
214. Understanding modifiable factors associated with childhood overweight and obesity in Tanzania primary schools establishing a foundation for evidence-based obesity prevention (Mosha V et al)
215. PTP with dihydroartemisinin - piperaquine and azithromycin for Malaria, sexually transmitted and reproductive tract infections in pregnancy in high sulphadoxine- pyrimethamine resistance areas

- in Kenya, Malawi and Tanzania: An international multi- centre 3- arm placebo - controlled trial (Lusingu J et al)
216. Implementation research of immunization for maternal immunization program in Dar es Salaam, Tanzania: Acceptability for mHealth (Mobile Health) program and willingness to pay for maternal pertussis immunization (Nkundu D et al)
 217. Malezi program evaluation protocol in Tabora (Freia J et al)
 218. PREDICT qualitative research for behavioral risk characterization in Tanzania (Kazwala R et al)
 219. Evaluation of the impact of a community health agent intervention on antiretroviral therapy retention and adherence in Tanzania (v.1.8 dated 1 August 2016) (Apicella L et al)
 220. Neuropsychiatric adverse effects of efavirenz in children living with HIV in Kilimanjaro Tanzania (Kinabo G et al)
 221. Prospective study of lopinavir based ART for HIV infected children globally (Living) (Ulega N et al)
 222. Evaluating the HIV infant tracking system (HIT System) to improve Early infant diagnosis of HIV in the US military HIV research program/ PEPFAR in the southern highlands using the HIT system© (Khamadi S et al)
 223. Incidence of pre - hypertension and its associated factors among secondary school students in Mwanza Tanzania: a prospective cohort study (Nsanya M et al)
 224. An examination of exposure and risk factors for emerging infectious disease at the animal-human interface (Mfinanga S et al)
 225. Understanding provider attitudes and behaviors regarding provision of contraceptive services to youth at health facilities in 3 districts of Dar es Salaam, Tanzania (Magige H et al)
 226. Integrated the diagnosis and management of HIV-associated central nervous system (CNS) infections into routine health services in low- and middle-income countries (LMICs); the DREAMM study (Mfinanga S G et al)
 227. Trachomatous trichiasis surveys in Tanzania (Mwingira U et al)
 228. Etiology risk factors and interaction and malnutrition and the consequences for child health and development (MAL- ED) (Mduma E et al)
 229. Antibiotic for children with diarrhea (ABCD) trial (Manji K et al)
 230. Zoonotic and livestock systems research (ZELS) (Mmbaga B et al)
 231. Coast analysis of amputation at a major public hospital in sub-Saharan Africa (Haonga B et al)
 232. Tuberculosis cohort study in the Dar es Salaam region (TB-DAR): A prospective collection of clinical data and biological specimens to study the epidemiology of Tuberculosis including molecular epidemiology and the evaluation of new diagnostics and biomarkers (Hella J J et al)
 233. The Simulated Ocular Surgery (SOS) trials: Randomized-controlled trials comparing intense simulation based surgical education for cataract and glaucoma surgery to conventional training alone in East Africa (Makupa W et al)
 234. Networking sampling study in the U.S and Tanzania (Mdeme E et al)
 235. Molecular epidemiology of brucellosis in northern Tanzania (Maro V et al)
 236. Discover learning (Njau P et al)
 237. Evaluation of a comprehensive platform for integrated communication initiative in Tanzania (Msofe J et al)
 238. Assessment of a community-based HIV treatment service delivery model on linkages to and retention in HIV care among female sex workers in Tanzania (Apicella L et al)
 239. IMPAACT 2005: A phase I/II open label, single arm to evaluate the pharmacokinetics, safety, and tolerability of demand in combination with optimized multidrug background regimen (OBR) for multidrug - resistant Tuberculosis (MDR-TB) in HIV infected and HIV uninfected children with MDR- TB version 1.0, dated 9 March 2017 (Maro H et al)

240. Early life interventions for childhood growth and development in Tanzania (ELICIT-study) (Mduma E et al)
241. Comparing food and cash assistance for HIV-positive men and women on antiretroviral therapy in Tanzania (Njau P et al)
242. Improving maternal and newborn health in Tanzania (IMPACT) a baseline survey (Mbekenga C et al)
243. Feasibility of universal access to HIV test & treat in Shinyanga and Simiyu regions. Tanzania (Desderius B et al)
244. Molecular epidemiology of rotavirus and vaccine performance in Tanzania (Wambui G E et al)
245. Program evaluation of the Tanzanian national cervical cancer prevention and control strategic plan (Chale S et al)
246. Evaluation of the in-service national training programme for nutrition officers (Mduma B et al)
247. Scale-up of dementia screening and low-resource interventions for dementia in older adults in Tanzania (IDEA scale up study/dePec study) (Urasa S et al)
248. Development of a brief screening method for identification of depression in older adults in sub-Saharan Africa (Urasa S et al)
249. Efficiency analysis of HIV/AIDS treatment support services at the facility and the community levels (Forsythe S et al)
250. Identification of HIV in sub-Saharan Africa (Urasa S J et al)
251. Acceptance of distance and online education among professionals and other stakeholders in Tanzania: Case of rural Mbulu district (Ombay C R et al)
252. Treatment of drug resistant tuberculosis in Tanzania: Trends of diagnosis, delays, and treatment outcomes between 2009-2013 (A retrospective cohort study) (Mollel E et al)
253. Assessing linkage and retention in care among previously treatment ineligible and out of care people living with HIV in the Lake zone, Tanzania (Njau P et al)
254. Efficacy of quadruple fortified salt in improving hemoglobin levels among anemic women of reproductive age in rural low resource setting (Mdoo P S et al)
255. Establishment of antibiotic stewardship at Mbeya Zonal Referral hospital in Tanzania (Haldeman M et al)
256. Identification of broadly HIV-neutralizing antibodies (bNAb) and characterization of viral reservoirs in HIV- infected patients in Mbeya, Tanzania (William W et al)
257. Phase 2 randomized, placebo-controlled, double-blind, study of prevention of infection with mycobacterium tuberculosis among adolescents who have previously received BCG (Pallangyo K et al)
258. Every newborn-simplified measurement integrating longitudinal neurodevelopment and growth (EN-smiling) (Manji K et al)
259. Support groups for HIV adolescents in Tanzania: A pilot study (Antelman G. et al)
260. Reaching 90-90-90: evaluation of patient and program characteristics associated with increased identification of adults and children living with HIV, ART initiation and retention in Tanzania (Antelman G. et al)
261. Early adolescent skills for emotions: A rapid ethnographic assessment (Annan J et al)
262. Strengthening multi-sectorial nutrition capacities among council officers in Tanzania (Nnally L et al)
263. Health system advocacy (HSA) (Mkuwa S et al)
264. Campylobacter infection a case study among children aged 2 to 59 months, in Dar es Salaam Tanzania (Bachuba L et al)
265. Assessment of aflatoxin exposure in children through complementary feeding in Singida district (Freddick R et al)

266. Etiological agents, antimicrobial resistance and clinical outcome of febrile illness and diarrhea in children under five in Dar es Salaam, Tanzania (Moyo S et al)
267. Monitoring of Lymphatic Filariasis in Persistent hot spot transmission zones (Mwingira U et al)
268. Trial to evaluate the safety, immunogenicity and efficacy of direct venous inoculation of two plasmodium falciparum porozoite based Vaccines (PfSPZ – Cvac and PfSPZ Vaccine) in HIV negative and HIV positive Tanzania adults (Jongo S et al)
269. Review a phase 111 of fludora® fusion 56.25 WP-SB (Clothianidin 50% + deltamethrin 6.25%) (Kirby M et al)
270. Risk factor scores for identification of woman with hyperglycemia during pregnancy in Arusha Urban, Tanzania (Msollo SS et al)
271. Investigation of food myths and their implications on management of diabetes in Northern Tanzania (Kasole R et al)
272. Early adolescent skills for emotions: Rapid ethnographic assessment (Annan J et al)
273. Effectiveness of food baskets in reducing micronutrients deficiency among pregnant Maasai women in Ngorongoro district (Mshanga N et al)
274. Strengthening health systems to reduce maternal mortality and morbidity in Simiyu region baseline study (Kwesigabo G et al)
275. A one health approach for studying zoonotic disease and women's health in selected districts of Tanzania (Kimera S et al)
276. The immunological determinants of protective immunity and immunopathology in trachoma (Burton M et al /Ramathan A)
277. Effects of anti- schistosoma treatment on intestinal mucosal and peripheral blood immune cell populations in *Schistosoma mansoni* infection (Jaka H et al)
278. Vector resistance to pyrethroids: Linkage between phenotypic resistance and ultimate malaria pathogen transmission (Philbert A et al)
279. Supply chain assessment for maternal and child nutrition commodities in Tanzania (Kahwa A et al)
280. Molecular classification of breast cancer via immunohistochemistry at Muhimbili referral hospital Tanzania (Mansouri H et al)
281. Genotoxic biomonitoring of pesticides exposure and fate of pesticides use in tomato-Based agro-ecosystem in Tanzania (Kapeleka J A et al)
282. Sero-prevalence of bovine brucellosis in the Pangani district: identification of risk factors for bovine infection and awareness of brucellosis amongst farmers (Jongo M et al)
283. Development of a nurse delivered intervention to address hypertension among HIV-infected adults in Tanzania (Manavalan P et al)
284. Efficacy difference type of bi-treated long lasting insecticidal nets and deployment strategy for control of malaria transmitted by pyrethroid resistant vectors (Mosha F et al)
285. Effects of dietary nitrate and folate supplementation on blood pressure in hypertensive Tanzanians: A feasibility trial (Temu G et al)
286. Analysis of plasma biomarker and their association with treatment response in patients with tuberculosis (Mvungi H et al)
287. Assessment of under two years children exposure to fluoride through food consumption; A case study of mount Meru slopes in Arusha, Tanzania as it involves human beings (Joseph L et al)
288. From birth companions to respectful maternity care: Building evidence for effective implementation (Makafu C et al)
289. Assessment of biochemical markers and their association with cardiovascular diseases in patients from Kilimanjaro region (Roman W et al)

290. Evaluation protocol for optimized methadone delivery with take-away doses in Tanzania (KPIS study) (Mbwambo J et al)
291. Leading safe choices patient satisfaction survey- A client exit survey of patient who received post partum family planning and comprehensive post-abortion care in 4 pilot facilities (Nzovu Ulenga 1 et al)
292. Assessing FAT GENE (FTO) and dietary patterns as determinants for obesity in school children in Arusha Tanzania (Chomba H et al)
293. Qualitative evaluation study: Tanzania's public sector systems strengthening (PS3) project (Kwesigabo G et al)
294. Seroprevalence of bovine brucellosis pangani district: Identifvcaton of risk factors for bovine infection and awareness of brucellosis among st famers (Jong M et al)
295. Formative Research for effects: Engaging fathers for effectivecare for young child nutrition and development in Tanzania (Kieffer P et al)
296. Improving access to maternal and new born health in Mwanza Tanzania (IMPACT) (Mgonja M et al)
297. Prospective evaluation of the AMREF health Africa Uzazi Uzima Project for reproductive, maternal, newborn, and adolescent health in Simiyu region, Tanzania: An assessment of changes in coverage (Ngilangwa D et al/ Serafina Mkuwa new PI)
298. Phase III evaluation of fludora 56.25% WP-WP-SB (clothianidin 5% + deltamethrin 6.25%) for indoor residual spraying for malaria vector control in Muheza, N.E Tanzania (Mosha F W et al)
299. Pyrethroid- PBO impregnated blankets for control of malaria in humanitarian emergency situations (Kitau J et al)
300. Reducing the burden of chronic psychotic disorders in Tanzania (Mbwambo J et al)
301. Diversity, role and farmers' perception on ape fly (*Spalgis* spp) in Tanzania (Nasari P Set al)
302. Tuko-Pamoja: We are together care givers of patients with severe mental illness: Experiences of family interventions in Tanga, Tanzania (Hatløy K et al)
303. Family planning among female sex workers living with HIV in Tanzania (Apicella L et al)
304. Molecular characterization of brucella species from abattoir workers and animals slaughtered at Dodoma abattoir (Luwumba D et al)
305. Effect of software interventions for improving hand washing in rural Tanzania: An impact evaluation (Kinyagu J et al)
306. Malacological survey of freshwater snail intermediate hosts for schistomiasis in Mwanza and Shinyanga regions, North-western Tanzania (Angelo T et al)
307. Development of an HIV negative registration cohort for future participation in an HIV vaccine study (Pamba D et al)
308. Sickle cell diseases genomics network of Africa (Makani J et al)
309. The use of real time data for effective e decision making among health stakeholders in Local government authority: a case study of HIV prevention and GBV among adolescent girls & young women (Msuya M et al)
310. Towards integrating livestock and human health: Development of Innovative surveillance tools for risk management of food borne and non-communicable diseases (Senkolo M et al)
311. IMPAACT of Alcohol focused interventions on treatment outcomes among HIV patients in Tanzania and South Africa: A feasibility study (Kapiga S et al)
312. Prevention of diabetes in Africa: A randomized placebo controlled, double-blind, phase II safety trial of metformin in HIV-infected persons with pre-diabetes (Mfinanga G et al)
313. Strengthening nurses and midwifery associations in East Africa: A focus on sustainability (Mwasha L et al)

314. Squeac assessment for the next generation program in Simiyu and Ruvuma regions of Tanzania (Musumba K et al)
315. Patterns and risk factors of HIV and non-communicable diseases in urban Tanzania: Exploring the potential for family-based interventions (Likindikoki S et al)
316. Streamlining ethics review process and regulatory framework in Tanzania (SMERT) (Ntinginya et al) (EDCTP study)
317. Outcomes of protease inhibitors antiretroviral therapy regimen among adolescents and adults at urban in Dar es salaam (Rugemalila J et al)
318. Effects of direct health facility financing (DHFF) on the performance on health systems in Tanzania: A process and impact evaluation of DHFF program (Kapologwe NA et al)
319. Assessment of needs and preferences for media use, income generation and reproductive health among Tanzania youth aged 15-24 years (Mashoto K et al)
320. The burden of sexually transmitted infections and non-communicable disease among adults in the fishing communities in North-western Tanzania (Kapiga S et al)
321. Pilot project on birth companionship in Kigoma (Chaote PC et al)
322. Developing and maintain Kilombero and Ulanga anti-retroviral cohort (KIULARCO) at SFRH in Ifakara, Tanzania (Maja Weisser et al)
323. Demonstrating non-inferiority of lower dose calcium supplementation during pregnancy for reducing preeclampsia and Neonatal outcomes (Massanja H et al)
324. Novel sustainable approaches to mosquito management through attract and kill techniques (Mboera LG et al)
325. Assessment of nutrition status and aflatoxin and pesticides exposure among adolescents in boarding secondary schools in Kilimanjaro region (Nicholaus C et al)
326. An epidemiological assessment of prevalence and incidence of epilepsy and its relation to onchocerciasis control measures using Ivermectin in the endemic area of Mahenge, Ulanga district, Tanzania (Mmbando B et al)
327. Prevention of diabetes in Africa: a randomized placebo controlled blind phase II safety trial of Metformin in HIV- infected persons with pre-diabetes (Mfinanga S et al)
328. Streamlining ethics review process and regulatory frame work in Tanzania (SMERT–EDCTP project) (Ntinginya E et al)
329. Novel Sustainable approaches to mosquito management through attract and kill techniques (Mboera LG et al)
330. Tuberculosis cohort study in the Dar es Salaam region (TB- DAR): A prospective collection of clinical data and biological data and biological specimens to study the epidemiology of tuberculosis, including molecular epidemiology and evaluation of new diagnostics and biomarkers (Hella J et al)
331. Health and aging in Africa: Longitudinal studies of INDEPTH communities INDEPTH: International network for the evaluation of populations and their health (Kilewo J et al)
332. Improving children life chances in high risk, low income settings: Designing a new generation longitudinal cohort study of child development (Krutiova S et al)
333. From birth companions to respectful maternity care building evidence for effective implementation (Makafu C et al)
334. An open- label, partially randomized trial to evaluate the efficacy, safety and tolerability of a 4-month treatment of bedaquiline plus pretomanid plus moxifloxacin plus pyrazinamide (BPamZ) compared to a 6 month treatment of HRZE/HR (control in Adult participants with drug – sensitive smear positive pulmonary tuberculosis (DS-TB) and a 6 – month Treatment of BPamZ in adult participants with drug resistant, smear- positive pulmonary tuberculosis (DR-TB) (Ntinginya E S et al)

335. Development evaluation and implementation of a practical health education intervention package for prevention and of taenia solium cysticercosis and taeniosis in Tanzania (Ngowi H et al)
336. Understanding the care provider workforce in Africa (Somi G et al)
337. Pilot social network intervention to reduce HIV and IPV among adolescent girls in Dar es salaam, Tanzania (Msichana salama study) (Kajula L et al)
338. Documenting the system cost of unsafe abortion and provision of contraception in Tanzania (Ruhago G et al)
339. Final evaluation of MDH shape Kagera project (Tumushabe J et al)
340. Evaluation of pilot implementation of project (ECHO) Tanzania: A model of tele-mentoring to build health care workers capacity in HIV care and treatment (Maokola W et al)
341. Community and provider driven social accountability intervention (caPSAI study) (Geubbels E et al)
342. The science of rabies elimination in Tanzania (Lushasi K et al)
343. Microbiological contamination of local water sources and descriptive study of Diarrhea prevalence in Rural Tanzania (Schildroth S et al)
344. Antiretroviral therapy for acute HIV infection (Mangu C et al)
345. Improving TB case detection in a rural population by linkage to an HIV test and treat programme (Mfinanga S et al)
346. Partnership to enhance antimicrobial use in resource limited settings (PEARL): an assessment of need and feasibility of antimicrobial stewardship programs (Mmbaga B et al)
347. Bridging the know-do-gap among healthcare workers and decision-makers through improved routine measurement of the quality of material and newborn care (Manzi F et al)
348. Fat accumulation and glucose sensitivity in Maasai pastoralists: The impact of seasonal variation on dietary intake, physical activity and skeletal muscle morphology (Ramaiya K et al)
349. SMS for life in Tanzania: A case study from a health systems integration perspective (Sando M M et al)
350. Identify and assess the tools and framework used in aligning external funds to local priorities and agenda (Sando M M et al)
351. Integrated care for HIV and non-Communicable diseases in Africa: A pilot study to inform a large-scale trial (Mfinanga S et al)
352. Factors affecting malaria treatment outcome among pregnant treated with artemether-lumefantrine in Tanzania (Kamuhabwa A et al)
353. Development of HIV negative registration cohort for future participation in HIV Vaccine study (Aboud S et al)
354. Health care workers perspectives on using emergency obstetric and newborn care skills checklist for assessment and refresher training of maternity staff in Mbeya, Njombe, and Songea regions in Tanzania (Bundala F et al)
355. A cash plus model on youth wellbeing and safe, healthy and productive transitions to adulthood: Intervention and impact evolution (Mitti R et al)
356. HIV-I genotyping and antiretroviral resistance profiling of HIV-I patients who are in combined antiviral treatment (cART) in Dar es Salaam (Lyamuya E et al)
357. Examining fidelity health care providers to tuberculosis (TB) Diagnosis Guidelines in Tanzania (Mssola V et al)
358. Validation of the Gene-Xpert® breast cancer STRAT4 assay for rapid analysis of breast cancer biomarker status from fine needle aspiration biopsies in Tanzania (GX-BCB) (Vuhahula E et al)
359. Introduction of hepatitis B birth dose vaccine in African endemic countries: A case study from Tanzania (Yonah G et al)

360. Protocol for a process evaluation of a behavior change intervention to promote update of improved latrines and hand washing with soap at key times in Morogoro Region, Tanzania (Massa K et al)
361. Barriers to implementing delayed cord-clamping practices for neonates in Dar es Salaam Tanzania: Can education play a role? (Ahluwalia A et al)
362. Oral health of non-urban regions in Tanzania (Megiroo S et al)
363. Study of reaching first time parents with contraceptive within Tuungane, a population health and environmental program greater Mahale region, Tanzania (Magige H et al)
364. Filemon going native (Ichumbaki E et al)
365. Examining facility perinatal mortality in selected health facilities in Kagera and Mara regions; a secondary analysis of DHIS2 and FPM study data (Bundala F et al)
366. Measurement of progress towards Universal health coverage (UHC) in Tanzania: The Kisesa/Magu district longitudinal study community study (Urassa M et al)
367. Using social and behavior change communication (SBCC) to improve understanding and adoption of optimal nutrition and postpartum family planning practices in Lake zone, Tanzania phase 2 (Drake M et al)
368. Prevalence of, and factors associated with, virologic suppression and drug resistance in HIV positive children and adolescents on antiretroviral therapy in Tanzania (Khamadi S et al)
369. Usafi wa mazingira Tanzania (UMATA) program outcome survey (Matiko C et al)
370. Evaluation of the shang ring vs mogen clamp for early circumcision (EIMC) in sub-Saharan Africa (Christensen A et al)
371. Rural electrification and community development project by the innovative technology and energy center (ITEC) and related documents. (Rhee H S et al)
372. An exploration of the exposure effects of inter- parental violence on child development (Minanango C et al)
373. The H3A, Diabetes Study: A multi-center study of the prevalence and environmental and genetic determinants of type 2 diabetes in sub-Saharan Africa (Kagaruki G B et al)
374. Beyond the world happiness report: A mixed methods investigation of wellbeing in Tanzania (Kaufman M et al)
375. Evaluating an HIV risk screening tool in a population of orphans and other vulnerable children program beneficiaries in Tanzania (Antelman G et al)
376. Leveraging mobile technology and financial incentives to increase non-communicable disease screening rates in Tanzania (Manang F et al)
377. Assessment of access to sexual and reproductive health commodities in Tanzania (Msuya M et al)
378. Rapid and accurate diagnosis of pediatric (RapPaed) TB-An AIDA (Assessment of Innovative Diagnostics and Algorithms) for early and sensitive detection of acute TB (platform study RaPaed-AIDA- TB) (Ntinginya E et al)
379. Risk for HIV infection through Nematodes (RHINO) (Chachange M et al)
380. The capability of health training institutions in producing competent health workers in Tanzania (Nyamtema A S et al)
381. Design and impact of an integrated multi-sectorial support program on health and social status for children in mining: Formative study and evaluation for the USAID Kizazi Kipya Program (Geubbels E et al)
382. May measurement month 2018 (MMM-18) (Tibazarwa K et al)
383. Evaluation of under reporting of tuberculosis cases in health care facilities in Tanzania (Kilale A M et al)

384. Beyond research to perinatal care improvement: Sharing best practices in fetal rate monitoring and neonatal resuscitation at three district Hospitals in Manyara region (Munyaw Y E et al)
385. Evaluation on acceptability and effectiveness of newborn heart and lung simulator in a clinical setting at Haydom Tanzania (Mashiro R et al)
386. Potential of non-human primates as a reservoir for human yaws (Mfinanga S et al)
387. Exploring mothers' experiences at human rights-based approaches to maternal health (Jorgensen A et al)
388. Attractive toxic sugar baited resting places against *Aedes aegypti* in urban Tanzania (Sandra F et al)
389. Assessment of infection prevention and control practices in prisons in Northern Zone Tanzania (Kidayi PL et al)
390. Prevalence of asymptomatic and submicroscopic malaria parasitaemia in Korogwe North Eastern Tanzania (Martine P et al)
391. Understanding providers attitudes and behaviors regarding provision of contraceptive services to youth at health facilities in 3 districts of Dar es Salaam, Tanzania (Mwandalima I et al)
392. Holistic approach to unravel antibacterial resistance in East Africa (HATUA) (Mshana SE et al)
393. Field evaluation of a deltamethrin only long lasting insecticidal net, Tsara net in comprison to dawa Plus 2.0, against field populations of anopheles arabiensis in experimental huts, Tanzania (Moore S et al)
394. SHOPS PLUS: Tanzania quallitative research for condom mtotal market approach (Kapesi N et al)
395. mHealth Tanzania public private partnership/ cardno tanzania (Mtasigwa Saulo M et al)
396. Strenthnering accountability for better health outcomes through understanding the health systems' bottlenecks: Insights from Tanzania (Masuma M et al)
397. Needs assessment among nurse and midwives regarding intimate partner violence and mental health care during pregnancy and postpartum periods (Ambikile JS et al)
398. Knowledge, attitudes and practices of healthcare providers (HCPs) towards the dapivirine (DPV) ring project (Wamoy J et al)
399. Ultrasound in managing tuberculosis: A randomized controlled two-center study (Martin Rohacek et al)
400. The impact of integrating sexual and reproductive health rights: and water sanitation and hygiene interventions to improve adolescents' schools health in rural, Tanzania (Ngilangwa DP et al)
401. Antimicrobial awareness and prescribing behavior amongst health care professionals in Tanzania (Crocker C et al)
402. Keeping Girls secondary school in Msalala district Shinyanga region (Mkuwa S et al)
403. Development of a coping skills intervention to promote mental health resilience among vulnerable youth in Tanzania (Fausta Njau et al)
404. Assessment of health service barriers experienced by the most underserved (Matechi E et al)
405. Postpartum HIV care engagement in the context of option B+ (Mmbaga B et al)
406. Silica dust exposure to stone-crushers Tanzania (Mendard A et al)
407. AnthroTox, combining social and natural sciences to understand and manage global anthropogenic toxicants (Geissler PW et al)
408. Hospital-based interventions to tackle malnutrition in the general population in Rorya district, with a focus on women in the reproductive age and children under the age of five (Chiragi et al)
409. Assessment of impact of lucky iron fish on child's hemoglobin status as measured by non-invasive (standard hospital method) in Shinyanga region of Tanzania (Malimbwi M B et al)
410. Water adequacy in delivery rooms of Tanzanian health care facilities (Paennea E et al)

411. Retinal disease Burden: prevalence and associated risk factors in Mwanza, Tanzania (Bradley J et al)
412. Insecticide treated uniforms and skin repellent to reduce Malaria incidence in military personnel on active duty in regions of hyperendemicity (Moore S et al)
413. Evaluation protocol for optimized methadone with take away doses in Tanzania (Mbwambo J et al)
414. Durable practical, effective and affordable formats for insecticide treated eave baffles that protect households and malaria transmission (Okumu F et al)
415. A phase IV randomized trial to evaluate the virologic response and pharmacokinetics of two different potent regimens in HIV infected women initiating triple antiretroviral regimens between 20 and 36 weeks of pregnancy for the prevention of mother to child transmission: NICHD P1081 version 3.0 dated 2 April 2015 (Mmbaga B et al)
416. Geographically concentrated multi-level HIV prevention in Bukoba municipal council outcome (Morales F et al)
417. Singinda nutrition and agro ecology project (Kassim N et al)
418. Doxycycline 200mg/d vs. 100mg/d for 6 weeks to improve filarial lymph edema- a multinational, double – blind, randomized, placebo-controlled trial (Mwingira U et al)
419. A multi- country prospective safety of subjects exposed to the candidate Ebola vaccines Ad26 ZEBOV and MVABN Filo (VAC52150EBL4001) (Ntinginya E et al)
420. Design and impact of an integrated multi-sectorial support program on health and social status for children in mining: formative study and evaluation for the “USAID Kizazi Kipya” Program (Geubbels E et al)
421. ImpaaP1026s, pharmacokinetic properties of antiretroviral and related drugs during pregnancy and postpartum (Ngocho S et al)
422. Needs assessment to improve maternal child nutrition – sensitive agricultural interventions in Lindi district, Tanzania (Nyarucha C et al)
423. Assessment of community-based HIV treatment servicedeliverly model on linkages to and retention in HIV care among female sex workers in Tanzania (Apicella L et al)
424. Evaluation of the behaviour change of midwives after introducing early essential newborn care at Muhimbili National Hospital, Dar es Salaam, Tanzania (Fukutomi R et al)
425. Evaluating priority setting for health research in Tanzania (Maluka S et al)
426. The 2018 Tanzania HIV impact survey (2016THIS) (Chuwaa A et al)
427. Cash transfer to adolescent girls and young women to reduce sexual behavior an impact evaluation (CARE study) (Wambura M et al)

8.2 Appendix 2: Permission to Publish

1. The Impact of *Moringa Oleifera* Leaf Powder Supplementation on Reducing Anaemia among Children aged 6 to 24 months in Kisarawe District Tanzania by Angela E. Shija, Susan F. Rumisha, Ndekya M. Oriyo, Stella P. Kilima, Julius J. Massaga.
2. Retention in care across the PMTCT continuum in the Kilimanjaro Region of Tanzania” by Cody Cichowitz, Festo Mazunguni, Linda Minja, Prosper Njau, et al.
3. Childbirth experience of women living with HIV in sub-Saharan Africa: A neglected event in the PMTCT care continuum” by Cody Cichowitz, Melisa H. Watt & Blandina T. Mmbaga.
4. Provider perspectives on PrEP for adolescent girls and young women in Tanzania: the role of provider biases and quality of care” by Nanlesta Pilgrim, Nrupa Jani, Sanyukta Mathur, Catherine Kahabuka, et al.
5. Protein and Iron Contents and Bioaccessibility in Local Modified Diets for Children Aged 6 to 23 Months in Bukoba, Tanzania” by Mbela Domina Esther Nkuba, Kinabo Joyce, Mwanri Akwilina Wendelin and Ekesa Beatrice
6. Provitamin A Carotenoids Content and Bioaccessibility in the Modified Local Diet for Children Aged 6-23 Months in Bukoba, Tanzania” by Mbela Domina Esther Nkuba, Kinabo Joyce, Mwanri Akwilina Wendelin and Ekesa Beatrice
7. Field evaluation of the BG-Malaria trap for monitoring malaria vectors in rural Tanzania villages by Elis P. A. Batista, Halfan Ngowo, Mercy Opiyo, Gasper K. Shubis, et al.
8. Understanding factors influencing linkage to HIV care after testing HIV positive in rural Mbeya, Tanzania: Qualitative findings of a sequential explanatory mixed methods study” by Erica S. Sanga, Ferdinand C. Mukumbang, Adiel K. Mushi, Wondwossen Lerebo, Christina Zarowsky
9. Early Life Interventions for Childhood Growth and Development in Tanzania (ELICIT): A Protocol for a Randomized Factorial, Double-Blind, Placebo-Controlled Trial of Azithromycin, Nitazoxanide and Nicotinamide” by Mark D. DeBoer, James A. Platts-Mills, Rebecca J. Scharf, Joann M. McDermid, et al.
10. Improving Sexual Health Education among Adolescent in Tanzania through Game-Based Learning and Gamification” by Hussein Haruna, Xiao Hu, Samuel Kai Wah Chu, Robin Mellecker, Goodluck Gabriel and Patrick Siril
11. Pre-post Effects of a Tetanus Care Protocol Implementation in a sub-Saharan African Intensive Care Unit” by Riaz Aziz, Soledad Colombe, Gibonce Mwakisambwe, Solomon Ndezi, Jim Todd, Samuel Kalluvya, et al.
12. Increasing female leaders in global health: evidence-based interventions to address gender-based challenges” by Jyoti Mathad, Lindsey Reif, Grace Seo, Kathleen Walsh, Margaret McNairy, Myung Hee Lee, Adolfine Hokororo, et al.
13. Targeting cattle for malaria elimination: marked reduction of *Anopheles arabiensis* survival for over six months using a slow-release ivermectin formulation” by Kija Ng’habi, Gerry Killeen, Gloria Abizanda, Angel Irigoyen Barrio, et al.
14. Validating a measurement for intrapartum and very early newborn death before discharge in health facilities in Tanzania” by Marya Plotkin, Dunstan Bishanga, Hussein Kidanto, Mary Carol Jennings, Jim Ricca, et al
15. *Application of Community-Based and Integrated Strategy to Reduce Malaria Disease Burden in Southern Tanzania: the study protocol of China-UK-Tanzania Pilot Project of Malaria Control*” by Duoquan Wang, Prosper Chaki, Yeromin Mlacha, Mihayo Gabriel Michael, et al.
16. Factors Affecting the Uptake of Three or More Doses of Sulfadoxine Pyrimethamine for Prevention of Malaria in Pregnancy in Selected Health Facilities, Arusha Region, Tanzania” by Witness M. Mchwampaka, Donath Tarimo, Frank Chacky, Ahmed Mohamed, Rogath Kishimba, Angela Swameli

17. Fetal heart rate monitoring in a low-resource setting; continuous Doppler versus intermittent fetoscope - A randomized controlled study” by Paschal F. Mdoe, Hege L. Ersdal, Estomih Mduma, Robert Moshiri, Ingvild Dalen, Jeffrey M. Perlman, Kidanto Hussein
18. Newborn Resuscitation in a Rural Tanzanian Hospital: Quality of Positive Pressure Ventilation of Admitted Newborns and Outcome within 7 days by Robert Moshiri, Jeffrey M. Perlman, Kidanto Hussein, Jan Terje Kvaloy, Paschal F. Mdoe, Hege L. Ersdal
19. Implementation of a strap-on automatic fetal Doppler (Moyo) improves quality of midwifery practices in a resource-limited tertiary hospital: observational study in Tanzania” by Benjamin A. Kamala, Hege L. Ersdal, Ingvild Dalen, Muzdalifat S. Abeid, Matilda M. Ngarina, Jeffrey Perlman, Hussein L. Kidanto
20. State transition modeling of complex monitored health data” by Jörn Schulz, Jan Terje Kvaløy, Kjersti Engan, Trygve Eftestøl, Samwel Jatosh, Hussein Kidanto and Hege Ersdal
21. Processes and dynamics of linkage to care from mobile/outreach and facility-based HIV testing models in hard-to-reach settings in rural Tanzania by Erica S. Sanga, Ferdinand C. Mukumbang, Adiel K. Mushi, Willyhelmina Olomi, et al.
22. *Made in Denmark: Scientific Mobilities and the Place of Pedagogy in Global Health* by Branwyn Poleykett
23. Evaluation of a simple polytetrafluoroethylene (PTFE)-based membrane for blood-feeding of malaria and dengue fever vectors in the laboratory by Doreen J. Siria, Elis P. A. Batista, Mercy A. Opiyo, Elizangela F. Melo, et al.
24. Impact of schistosome infection on long-term HIV/AIDS outcomes: a longitudinal study with competing risk analysis by Soledad Colombe, Richard Machemba, Baltazar Mtenga, Peter Lutonja, Samuel Kalluvya, et al.
25. Potential benefits of combining transfluthrin-treated sisal products and long-lasting insecticidal nets for controlling indoor-biting malaria vectors by John P. Masalu, Fredros O. Okumu, Arnold S. Mmbando, et al.
26. "I was relieved to know that my baby was safe": Women’s attitudes and perceptions on using a new electronic fetal heart rate monitor during labor in Tanzania” by Sara Rivenes Lafontan, Johanne Sundbye, Hege L. Ersdal, Muzdalifat Abeid, Hussein L. Kidanto, Columba K. Mbekenga
27. Mesocosm experiments reveal the impact of control measures on malaria vector life history and population dynamics” by Kija Ng’habi, Mafalda Viana, Jason Matthiopoulos, Issa Lyimo, et al.
28. Lower HIV-1 viral loads in individuals co-infected with *Schistosoma* sp. after adjustment for duration of HIV-1 infection by Soledad Colombe, Claudia J. de Dood, Donald Miyaye, Ruth G. Magawa, Julius Mngara, Samuel E. Kalluvya, Lisette van Lieshout, Paul L.A.M. Corstjens, Govert J. van Dam and Jennifer A. Downs.
29. The mosquitoes are preparing to attack us: knowledge and perceptions of *Anopheles* mosquito swarms in south-eastern Tanzania by Finda M, Kaindoa E, Nyoni A, Toe LP and F Okumu
30. Seasonal food insecurity in Haydom, Tanzania is associated with low birth weight and acute malnutrition: results from the MAL-ED study by authors’: Rogawski McQuade ET, Clark S, Eliwaza B, Scharf RJ, DeBoer MD, Patil C, Gratz J, Houpt ER, Svensen E, Mduma E and Platts-Mills JA
31. The path to elimination: trends in the health facility implementation of policies for the prevention of mother-to-child transmission of HIV from 2013-2016 in Malawi, Tanzania and South Africa” by authors: Harriet Jones, Alison Wringe, Jim Todd, John Songo, Xavier Oliver-Gomez, Mosa Moshabela, Eveline Geubbels, Mukome Nyamhagatta, Thoko Kalua, Mark Urassa, Basia Zaba and Jenny Renju
32. Sensory Evaluation of Improved and Local Recipes for Children Aged 6-23 Months in Bukoba, Tanzania” by Mbela, Domina Esther Nkuba; Kinabo, Joyce; Mwanri Akwilina Wendelin and Ekesa, Beatrice

33. Factors associated with institutional delivery: Findings from a cross-sectional study in Mara and Kagera Regions in Tanzania” by Dunstan R. Bishanga, Mary Drake, Young-Mi Kim, Amasha H. Mwanamsangu, Ahmad M. Makuwani, Jeremie Zoungrana, Ruth Lemwayi, Marcus J. Rijken and Jelle Stekelenburg
34. High efficacy of artemether-lumefantrine and dihydroartemisinin-piperaquine for the treatment of uncomplicated falciparum malaria in Muheza and Kigoma Districts, Tanzania” by Celine Mandara, Reginald Kavishe, Samuel Gesase, Janneth Mghamba, Esther Ngadaya, Peter Mmbuji, Sigsbert Mkude, Renata Mandike, Ritha Njau, Ally Mohammed, Martha Lemnge, Marian Warsame and Deus S. Ishengoma
35. Treatment of Drug Resistant Tuberculosis in Tanzania: Trends of Diagnosis, delays and treatment outcomes between 2009-2013” by Edson Mollel, Tom Decroo, Isack Lekule and Lut Lynen.
36. Epidemiological characterization of malaria in rural southern Tanzania following China-Tanzania Pilot joint Malaria Control Baseline Survey” by Khatib, R.A., Chaki, P. C., Mlacha, Y.P., Mihayo, MG, Gavana, T., Wang, D, Ning X and Salim Abdullah.

8.3 Appendix 3: Publications (Published papers/Technical reports/Policy Briefs/Book chapters)

1. Ghyselen A, Geissler PW, Lagae J, & Mangesho PE. Scenes of Amani, Tanzania: Biography of a postcolonial landscape. *J Landsc Archit* [Internet]. Routledge; 2017 Jan 2;12 (1):6–17. Available from: <http://dx.doi.org/10.1080/18626033.2017.1301285>
2. Kevin Queenan, Peter Mangesho, Moses Ole Neselle, Esron Karimuribo, Mark Rweyemamu, Richard Kock, Barbara Häslér (2017) Using local language syndromic terminology in participatory epidemiology: Lessons for One Health practitioners among the Maasai of Ngorongoro, Tanzania *Preventive veterinary medicine* Volume 139, Part A, Pp: 42–49
3. Mangesho PE, Neselle MO, Karimuribo ED, Mlangwa JE, Queenan K, Mboera LEG, et al. (2017) Exploring local knowledge and perceptions on zoonoses among pastoralists in northern and eastern Tanzania. *PLoS Negl Trop Dis* 11(2): e0005345. doi: 10.1371/journal.pntd.0005345
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5. Gerrets, R. P. M. & Mangesho, P. (2017). The botanical garden. In, *Traces of the Future: Archaeology of Medical Sciences in Africa*. Geissler, P. W., Lachenal, G., Manton, J. & Tousignant, N. (Eds.). Bristol: Bristol Intellect, p. 168-173
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7. Bwana VM, Mfinanga SG, Simulundu E, Mboera LEG and Michelo C. (2018). Accessibility of Early Infant Diagnostic Services by Under-5 Years and HIV Exposed Children in Muheza District, North-East Tanzania. *Front. Public Health* 6:139. doi: 10.3389/fpubh.2018.00139.
8. Olupot-Olupot P, Engoru C, Uyoga S, Muhindo R, Macharia A, Kiguli S, ...G. Mtove, et al. High Frequency of Blackwater Fever Among Children Presenting to Hospital With Severe Febrile Illnesses in Eastern Uganda. *Clin Infect Dis*. 2017 Apr 01;64(7):939-46.
9. Malima R, Emidi B, Messenger LA, Oxborough RM, Batengana B, Sudi W, ...G. Mtove, et al. Experimental hut evaluation of a novel long-lasting non-pyrethroid durable wall lining for control of pyrethroid-resistant *Anopheles gambiae* and *Anopheles funestus* in Tanzania. *Malar J*. 2017 Feb 17;16(1):82.
10. Mtove et al., Effects of early tranexamic acid administration on mortality, hysterectomy, and other morbidities in women with post-partum haemorrhage (WOMAN): an international, randomized, double-blind, placebo-controlled trial. *The Lancet Journal*.
11. Khalid Massa, Fadhili Kilamile, Emmanuela Safari, Amour Seleman, Anyitike Mwakitalima, Jonas G. Balengayabo, Telemu Kassile, Peter E. Mangesho and Godfrey M. Mubyazi “Contributing to the debate on categorising shared sanitation facilities as ‘unimproved’: An account based on field researchers’ observations and householders’ opinions in three regions, Tanzania” (*Plos One*)
12. Basilia Emidi, William N. Kisinza, Bruno P. Mmbando, Robert Malima, Franklin W. Mosha. Effect of physicochemical parameters on *Anopheles* and *Culex* mosquito larvae abundance in different breeding sites in a rural setting of Muheza, Tanzania”, *Parasites and Vectors Journal*. No: PARV-D-16-01120.

13. Species composition and breeding habitats of *Aedes aegypti* s.l. in Moshi, north-eastern Tanzania” Robert Kaaya, Basilia Emidi, Jovin Kitau, Johnson Matowo, Franklin Mosha, William Kisinza and Manisha Kulkarni. Tropical Medicine and International Health Journal. Manuscript No: TMAH-17-00005,
14. “Insecticide susceptibility Status of five species of mosquito vectors of human diseases in Muheza, Tanzania”. Basilia Emidi, William N. Kisinza, Robert D. Kaaya, Robert Malima & Franklin W. Mosha. Manuscript No: 152290
15. Kweka EJ, Mause E, Venter N, Derua YA, Kimaro E, Coetzee M (February 2017). Application of hydrolysis probe analysis to identify clade types of malaria vector *Anopheles funestus* sensu stricto from Muheza, north-eastern Tanzania. Medical and Veterinary Entomology, manuscript ID MVE-17-1572
16. Microbial larvicides for mosquito control: Impact of long-lasting formulation of *Bacillus thuringiensis* subsp. *israelensis* and *B. sphaericus* on non target organisms in western Kenya highlands (Yahya A. Derua, Samuel C. Kahindi, Franklin W. Mosha, Eliningaya J. Kweka, Harrysone E. Atieli, Guofa Zhou, Ming-Chieh Lee, Andrew K. Githeko, Guiyun Yan). This abstract has been submitted to the 66th Annual meeting of the American Society of Tropical Medicine scheduled to be held in November 2017. Abstract no. 17-A-1717-ASTMH.
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21. Skovdal M, Wringe A, Seeley J, Renju J, Paparini S, Wamoyi J, Moshabela M, Ddaaki W, Nyamukapa C, Ondenge K, Bernays S, Bonnington O (2017). Using theories of practice to understand HIV-positive persons varied engagement with HIV services: a qualitative study in six Sub-Saharan African countries. *Sex Transm Infect.* Jul;93(Suppl 3). pii: e052977. doi: 10.1136/sextrans-2016-052977. PubMed PMID:28736396; PubMed Central PMCID: PMC5739842.
22. Wamoyi J, Renju J, Moshabela M, McLean E, Nyato D, Mbata D, Bonnington O, Seeley J, Church K, Zaba B, Wringe A (2017). Understanding the relationship between couple dynamics and engagement with HIV care services: insights from a qualitative study in Eastern and Southern Africa. *Sex Transm Infect.* Jul;93(Suppl 3). pii: e052976. doi: 10.1136/sextrans-2016-052976. PubMed PMID:28736395; PubMed Central PMCID: PMC5739843.
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 95. Impact of non-pyrethroid Insecticide Treated Durable Wall Lining on age structure of malaria vectors in Muheza, Tanzania. Basiliana Emidi, William N. Kisinza & Franklin W. Mosha. *BMC Research Notes Journal*
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8.4 Appendix 4: Tanzania Journal of Health Research Articles Volume 19 Issues 3&4, Volume 20 issues 1&2

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1. Intimate partner violence among HIV infected and uninfected pregnant women delivering at a national hospital in Tanzania: Using a modified screening tool. Hussein I. Kidanto, Andrew H. Mgaya and Birgitta Essen.
2. Quantification of pregnant mothers' intention towards infant and young child feeding: a clinic-based study in rural West Bengal, India. Aparajita Dasgupta, Swanya P. Maharana, Bobby Paul and Shobhit Garg.
3. Prevalence and associated factors of late HIV diagnosis in north-western rural Tanzania: a cross sectional study. Daniel W. Gunda, Rashid A. Kaganda, Fatma A. Bakshi, Semvua B. Kilonzo and Bonaventura C. Mpondo.
4. Prevalence and factors associated with late antenatal care visit among pregnant women in Lushoto, Tanzania. Flora Njiku, Herman L. Wella, Adellah Sariah and Joyce Protas.
5. Infant and young child feeding practices: a ProPAN based analysis on Unguja Island in Zanzibar, Tanzania. Joyce Kinabo, Akwilina W. Mwanri, Peter Mamiro, Nyamizi Bundala, Janet Picado, Kissa Kulwa, John Msuya, Julius Ntwenya, Aneth Nombo, Rehema Mzimhiri, Fatma Ally, Asha Salmini, Elizabeth Macha and Edith Cheung.
6. Association between serum transferrin receptor levels and malaria recurrence in a malaria endemic area in Tanzania. Ummehani Dossajee, Emmanuel Athanase, Linda Minja, Pendo Ibrahim, Claudia Kabamanya, Charles Mwanziva, Pius Horumpende and Jaffu Chilongola.
7. Malaria surveillance and use of evidence in planning and decision making in Kilosa District, Tanzania. Leonard E.G. Mboera, Susan F. Rumisha, Tabitha Mlacha, Benjamin K. Mayala, Veneranda M. Bwana & Elizabeth H. Shayo.
8. Characterization of malaria vectors in Huye District, Southern Rwanda. Chantal Nyirakanani, Raymond Chibvongodze, Lenson Kariuki, Michael Habtu, Moses Masika, Dunstan Mukoko and Kato J. Njunwa.
9. Insecticide susceptibility status of human biting mosquitoes in Muheza, Tanzania. Basiliana Emidi, William N. Kisinza, Robert D. Kaaya, Robert Malima and Franklin W. Mosha.
10. Social capital and self-rated health: experiences from Makete district, Tanzania. Gasto Frumence and Tumaini Nyamhanga
11. Prevalence and predictors of anaemia among patients presenting with kidney diseases at a haemodialysis unit of the University of Dodoma Hospital in central Tanzania. Alfred J. Meremo, Masumbuko Y. Mwashambwa, Matobogolo B. Masalu and Janet Kapinga.

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1. Mapping clusters of chikungunya and dengue transmission in northern Tanzania using disease exposure and vector data. Debora C. Kajeguka, Robert D. Kaaya, Rachelle Desrochers, Mahmood Iranpour, Reginald A. Kavishe, Steven Mwakalinga, Karin L. Schiøler, Michael Alifrangis, Robbin Lindsay, Antonia Dibernardo, Franklin W. Mosha, Manisha A. Kulkarni
2. Knowledge and perceptions about indoor residual spray for malaria prevention in Mumberes division, Nandi County in Central province of Kenya . Stephen Munga, Zackary Kimwetich, Francis Atieli, John Vulule, Eliningaya Kweka
3. Possible causes of fever among patients with blood smear negative for malaria parasites at Bombo Regional Referral Hospital in Tanga, Tanzania . Mercy G. Chiduo, Mathias Kamugisha, Athanas Mhina, Filbert Francis, Jackson Mchomvu, Juma Kayanda, Ezekiel Malecela, Johari Sadi, Joseph Kaseka, Hamisi Msangeni, Martha Lemnge

4. Accuracy of maternal recall of birth weight and selected delivery complications in Zanzibar. Akwilina W. Mwanri, Faki Hamisi, Peter S. Mamiro
5. Perceived barriers to access available health services among men who have sex with men in Dar es Salaam, Tanzania. Daniel J. Magesa, Melkizedeck Leshabari
6. Self-medication practices and predictors for self-medication with antibiotics and antimalarials among community in Mbeya City, Tanzania. Debora C. Kajeguka, Esuvat Moses
7. Prevalence of diabetes mellitus in patients seeking medical care at Morogoro Regional Referral Hospital in Tanzania. Edson Kinimi, Sakurani Balthazary, Stephen Kitua, Sundi Msalika
8. Evaluating medical and systemic factors related to maternal and neonatal mortality at Nyakahanga Hospital in north-western Tanzania. Linda A. Winkler
9. Availability of prescribed medicines for elders at Sekou-Toure Regional Referral Hospital in Mwanza, Tanzania. Stanley Mwita, Nankondo Tunzo, Mary Jande, Kayo Hamasaki

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1. Supply chain management of laboratory supportive services and its potential implications on the quality of HIV diagnostic services in Tanzania . Gibson B. Kagaruki, Mathias L. Kamugisha, Andrew M. Kilale, Erasmus Kamugisha, Acleus S.M Rutta, Vito Baraka, Celine I. Mandara, Stephen M. Magesa, Godlisten Materu, Amos M. Kahwa, Rashid Madebe, Julius J. Massaga, Martha M. Lemnge, Leonard E.G. Mboera, Deus I. Ishengoma
2. Access and utilization of water and sanitation facilities and their determinants among pastoralists in the rural areas of northern Tanzania. Elias C. Nyanza, Ola Jahanpour, Jennifer Hatfield, Frank van der Meer, Lisa Allen-Scott, Karin Orsel, Sheri Bastien
3. Trust matters: Patients' and providers' accounts of the role of trust in hypertension care in rural Tanzania. Kahabi G. Isangula, Holly Seale, Tumaini M. Nyamhanga, Rohan Jayasuriya, Niamh Stephenson
4. Patterns and outcome of surgical management of anorectal malformations at a tertiary care hospital in resource limited setting: a Tanzanian experience. Ramadhan J. Mfinanga, Alicia Massenga, Florentina Mashuda, Japhet M. Gilyoma, Phillipo L. Chalya
5. Cardiovascular risk markers in type II diabetes and hypertension at the Battor Catholic Hospital, Volta Region of Ghana. William K.B.A. Owiredi, Sylvester Y. Lokpo, James Osei-Yeboah, Christian Obirikorang, Margaret T. Agyei-Frempong, Samuel Ametepe
6. Prevalence and risk factors of asymptomatic malaria among underfive children in Huye District, Southern Rwanda. Chantal Nyirakanani, Raymond Chibvongodze, Michael Habtu, Moses Masika, Dunstan Mukoko, Kato J. Njunwa
7. Factors influencing implementation of integrated management of childhood illness in Lindi Region, Southern Tanzania. Boniphace Idindili, Ul Haq Zaeem, Steven Ayella, Sumaiya G. Thawar, Majige Selemani, Strinic Dragana, John Kall
8. Antiretroviral therapy clinic attendance among children aged 0-14 years in Kahama district, Tanzania: a cross-sectional study. David P. Urassa, Sarah Matemu, Bruno F Sunguya
9. Assessing the effect of TB-HIV collaborative activities on knowledge and perception of TB patients - A cross sectional study in Garhwal region, Uttarakhand, India. Ranjeeta Kumari, Bhola Nath, Vertika Saxena
10. High prevalence of Plasmodium falciparum malaria among Human Immunodeficiency Virus seropositive population in the Lake Victoria zone, Tanzania. Domenica Morona, Maria Zinga, Mariam Mirambo, Said Mtawazi, Vitus Silago, Stephen Mshana

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1. Life threatening arrhythmias: Knowledge and skills among nurses working in critical care settings at Muhimbili National Hospital, Dar es Salaam, Tanzania. Dinnah I. Ruhwanya, Edith A.M. Tarimo, Menti Ndile
2. Magnitude and factors associated with overweight and obesity among adolescents in in semi-rural area of Babati District, Tanzania Furahini D. Tluway, Germana H. Leyna, Elia J. Mmbaga.
3. Socio-demographic determinants of dengue infection during an outbreak in Dar es Salaam City, Tanzania. Neema Camara, Billy Ngasala, Germana Leyna, Ahmed Abade, Susan F. Rumisha, Ndekyia M. Oriyo, Leonard E.G. Mboera.
4. Impact of asymptomatic Plasmodium falciparum on haematological parameters of pregnant women at first antenatal visit in South-western Nigeria. Oluwasola O. Obebe, Olufarati O. Falohun, Olaitan O. Olajuyigbe, Mike A. Lawani, Olubunmi A. Ajayi
5. Malnutrition and associated factors among adults starting on antiretroviral therapy at PASADA Hospital in Temeke District, Tanzania. Titus K. Kabalimu, Edson Sungwa, Warles C. Lwabukuna.
6. The burden and management of self-inflicted injuries at a tertiary care hospital in Mwanza, Tanzania. Alphonse B. Chandika, Phillipo L. Chalya, Kiyeti A. Hauli, Peter F. Rambau, Adela A. Mwakanyamale, Japhet M. Gilyoma
7. The impact of microfinance programmes on access to health care, knowledge to health indicators and health status among women in Moshi, Tanzania. Christopher D. Mtamakaya, Joachim Kessy, Damian Jeremiah, Sia Msuya, Babill Stray-Pedersen
8. Development partner support to the health sector at the local level in Morogoro region, Tanzania.
9. Gasto M. Frumence, Joy Chebet, Jennifer A. Callaghan-Koru, Idda Mosha, Dereck Chitama, Japhet Killewo, Peter Winch.
10. Attendance of male partners to different reproductive health services in Shinyanga District, North western Tanzania. Alfred Chibwae, Anthony Kapesa, Ola Jahanpour, Jeremiah Seni, Namanya Basinda, Emmanuel Kadelya, Evelyne Konje, Elias Charles Nyanza, Sospatro Ngallaba, Deborah Dewey.
11. Post-operative pain prevalence, predictors, management practices and satisfaction among operated cases at a Regional Referral Hospital in Dar es Salaam, Tanzania. Masumbuko Y. Mwashambwa, Isaya Maleva Yongolo, Secilia Ng'weshemi Kapalata, Alfred Jackson Meremo.
12. A recurrent gestational choriocarcinoma case complicated by a silent postpartum ruptured uterus: a unique presentation. Bariki L. Mchome, Gileard G. Masenga, Peyton Taylor.

8.5 Appendix 5: Internal and External Collaborators

1. Ifakara Health Institute (IHI)
2. Sokoine University of Agriculture (SUA)
3. Muhimbili University of Health and Allied Sciences (MUHAS)
4. Kilimanjaro Christian Medical University College (KCMUCo)
5. Kilimanjaro Clinical Research Institute (KCRI)
6. National Malaria Control Programme
7. National AIDS Control Programme
8. Neglected Tropical Diseases Control Programme
9. University of Dodoma (UDOM)
10. Nelson Mandela African Institute of Science and Technology (NM-AIST)
11. Uganda Virus Research Institute (UVRI)
12. Makerere University, Uganda
13. International Centre for Insect Physiology and Ecology (ICIPE), Kenya
14. London School of Hygiene and Tropical Medicine, UK
15. East African Community
16. University of Copenhagen /CMP, Denmark
17. Liverpool School of Tropical Medicine, UK
18. Centre for International Health, Norway
19. University of Bonn, Germany
20. World Health Organization
21. UNICEF
22. United Nations Population Fund (UNFPA)
23. Centers for Disease Control and Prevention (CDC), USA
24. USAID
25. RTI International
26. The European and Developing Countries Clinical Trials Partnership (EDCTP)
27. The Global Fund to Fight AIDS, Tuberculosis and Malaria
28. German Federal Ministry of Education and Research (BMBF)
29. University of Notre Dame
30. LMU Munich, Germany
31. University College London, UK
32. University of Cambridge, UK
33. Imperial College London, UK
34. University of St Andrews, UK
35. Aeras Africa
36. Statens Serum Institut (SSI), Sweden
37. Global Alliance for TB Drug Development (TB Alliance)
38. Bernhard-Nocht Institute of Tropical Medicine (BNITM), Germany
39. University of Antwerp, Institute of Tropical Medicine, Belgium
40. Korean Advanced Institute for Science and Technology (KAIST), Republic of South Korea
41. Chung-Ang University, Republic of South Korea
42. University of Edinburgh, Scotland (UK)
43. Georgetown University, USA
44. US Military HIV Research Programme, USA
45. Henry Jackson Foundation (HJF), USA