UNIVERSITY OF GHANA CENTRE FOR EVIDENCE SYNTHESIS AND POLICY (UGCES)

COLLABORATING INSTITUTES
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2 Ghana College of Physicians and Surgeons (GCPS), Accra
3 Noguchi Memorial Institute for Medical Research (NMIMR), UG, Legon
4 West African Centre for Cell Biology of Infectious Pathogens (WACCBIP), UG, Legon

WORKSHOP TITLE: ADVANCING INNOVATIVE, EVIDENCE-INFORMED, DEMAND-DRIVEN AND POLICY-RELEVANT RESEARCH FOR STRENGTHENING HEALTH SYSTEMS AND IMPROVING PATIENT OUTCOMES IN AFRICA THROUGH CAPACITY BUILDING IN EVIDENCE SYNTHESIS

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WACCIP, UNIVERSITY OF GHANA, ACCRA

This workshop was organized by the University of Ghana Center for Evidence Synthesis and Policy and supported by the NIHR through TIBA.

The Ghana-based collaborating Institutes and Centres included School of Public Health, Noguchi Memorial Institute for Medical Research (NMIMR) and West African Center for Cell Biology of Infectious Pathogens (WACCBIP) and the Ghana College of Physicians and Surgeons (GCPS).

Table of Contents

Background 4
Overall Goal of UGCES 5
Specific Objectives of the workshop: 5
Learning Outcomes 5
Immediate output 6
Long-term output 6
Main deliverables 6
Course methods and approaches 7
The Training Agenda 8
Overview of sessions ..... *Error! Bookmark not defined.*
Introduction and Course Overview 8
Facilitators 8
Participants 8
Vice-Chancellor's welcoming address 9
Statement by Prof Gordon Awandare 11
Statement by Prof. Abraham Kwabena Anang 12
Statement by Director, TIBA 12
Group photo 13
Workshop Modules 14
Introduction to Systematic Review 14
Formulating a Review Question 15
Developing the Review Protocol 16
Developing the Search Strategy and Boolean operators 16
Searching electronic databases for studies 16
Selecting Studies and Extracting Data 17
Assessing Quality of Included Studies (Risk of Bias Assessment) 18
Synthesis of Data (Qualitative and Quantitative) 19
Introduction to Review Manager (RevMan) 19
Sources Of Bias And Errors And how to Minimize Them 20
Assessing Sources of Heterogeneity and How to Address Them 20
Basic economic concepts and Integrating economics in systematic reviews 21
Making Sense of Biomedical Research 21
Review protocol Presentation 22

Closing ceremony 22
Immediate output 27
Long-term output 30
Participants Evaluation of Workshop 22
Evaluation Results 23
Bio of Facilitator 27
Workshop photos 43
Facilitators and participants share special moments 46
List of Participants 37
List of Facilitators 38
Participants' independent report 46
Bio of participants 50
Output from the workshop 61
Akili kassinga Kalinga 61
Opening ceremony 31
Annex 4 ..... *Error! Bookmark not defined.*
Systematic review protocol titles ..... *Error! Bookmark not defined.*

Background

Naturally, every doctor wants to choose the treatment that will lead to the best possible outcome for the patient. The scientific community also wants to avoid redundant research because it misleads and wastes the available funding for important and relevant research. Wastage is of particular concern in Low and Middle-Income Countries (LMICs) where funds for research are limited. Systematic review generates the best (overall) evidence needed to inform sound decisions and policies about caring for the patient and when planning new research. Systematic reviews pool all relevant studies and distil evidence at the highest level possible using an explicit, transparent, reproducible, methodical and comprehensive approach to search for relevant studies, extract and analyze data, and critically assess risk of bias (quality) of each of the studies included in the review. Despite its value and growing demand, the capacity to undertake systematic review or evidence-based research is limited in sub-Saharan Africa (SSA).

This workshop, organised by the University of Ghana Centre for Evidence Synthesis and Policy with funding from University of Edinburgh based Tackling Infections to Benefit Africa (TIBA) which is in turn supported by the National Institute of Health Research (NIHR), was to advance innovative, evidence-informed, demand-driven and policy-relevant research for strengthening health systems and improving patient outcomes in Africa through capacity building in evidence synthesis. The goal of the workshop was to stimulate interest and passion and equip participants with the essential skills and knowledge on gold standard approaches needed to increase the capacity in generating more research topics with high relevance, create critical mass of early career researchers and next generation scientists conscious of quality-driven and policy-relevant research and how scientists across Africa can be competitive in the global scientific community.

TIBA is an Africa-led, wide-ranging, multi-disciplinary research programme that explores and attempts to build African biomedical scientists to improve healthcare delivery. Therefore, knowledge in systematic review or evidence synthesis will help increase capacity of TIBA partners in generating more research topics that are driven by quality and relevance. By collaborating with the University of Ghana Centre for Evidence Synthesis (UGCES), a resource group of trainers who will ensure that the best

research evidence is produced and used to inform sound policy decisions and guidelines across Africa can be developed within TIBA.

Overall Goal of UGCES

To build critical mass of African scientists and institutions including Principal Investigators (PIs) and Co-PIs, mid-career scientists, next generation scientists, PhD and post-doctoral students, university lecturers, health professionals in decision-making levels and policy makers in the gold standard approaches and tools for health systems strengthening and effective healthcare delivery that will improve patient outcomes, and to advance innovative, evidence-informed, demand-driven and policy-relevant research in Africa.

Specific Objectives of the workshop:

- To create critical mass of TIBA members and leadership in evidence synthesis who will in turn support others in innovative research driven by quality, and increase output of systematic review publications across TIBA core areas
- To increase the capacity of TIBA members to undertake rigorous and reliable research, applying evidence synthesis skills
- To train TIBA members and leadership at the highest level of innovative research that will transform their research and make them competitive globally
- To train participants on how to prepare systematic reviews (quantitative and qualitative reviews) and rapid reviews and to integrate the evidence in their decision making or for publication in a peer-reviewed journal
- To train participants in basic economic concepts and principles and how to incorporate economic evidence into systematic reviews

Learning Outcomes

By the end of the workshop participants should be able to:

- Follow the systematic review process and demonstrate key abilities in conducting at least one systematic review within two years, with further support from facilitators

- Recognize the similarities and differences in the approaches to synthesizing different types of evidence (e.g. clinical effectiveness, diagnostic test accuracy, qualitative as well as non-medical evidence)
- Use the Cochrane Software (RevMan) to prepare a systematic review protocol for grant application or full systematic review for publication
- Apply systematic review knowledge and skills to conduct reliable research
- Transfer knowledge and skills acquired to the mentoring of early career researchers and next generation scientists
- Integrate economic evidence in cost-effectiveness reviews

Output of workshop

Immediate output

Participants worked independently following standard systematic review principles and methods to prepare and present drafts of their systematic review protocols on various topics/questions identified in their specialty areas. The review protocol titles generated are listed in the Annex 1.

Long-term

Participants will build on their knowledge with the support of the facilitators and complete a full systematic review (and meta-analysis) for submission to a peer-reviewed journal for publication and to create critical mass of biomedical scientists, health professionals and policy makers sensitized to the value of gold standard approaches and tools used, and advance innovative, evidence-informed and policy-relevant research that will strengthen evidence-based healthcare delivery.

Main deliverables

At the end of the training workshop:

- Participants would have identified a demand-driven, practice, implementation or policy-relevant clinical/public health problem, formulated an appropriate review question using **PICOS** - to define the following: P = Population/participants/patients, I = Intervention, C = Comparison/comparator/control, O = Outcome of interest and S = Study design. Participants would have developed search terms, built search concepts and applied the concepts built to search electronic databases such as PubMed

(MEDLINE) and EMBASE to retrieve literature. Using the Cochrane RevMan format, participants would have completed a systematic review protocol which should be further developed after the workshop into a full systematic review manuscript to be submitted for publication in a peer-reviewed scientific journal, and which should go on to inform policy and practice.

- Workshop report to be produced by the Facilitator.

Methods

The course was intensive and participatory with a focus on building competencies and skills among the participants. The workshop comprised both theory and hands-on activities and delivered using theory-grounded and problem-based learning approaches, following the outline below:

- Introduction to systematic review and meta-analysis and the value of evidence-based healthcare, and detailed description of what systematic review is, the systematic review process and the strengths and limitations of systematic reviews.
- Formulating the review question and developing the review protocol
- Step-by-step guidance on how to perform a systematic review and meta-analysis and rapid review, emphasizing on the practicalities often encountered.

The workshop taught the practical skills needed to conduct systematic reviews and evidence-informed decision making in public health. Participants were randomly selected into groups and guided to select a topic of high relevance and formulate an appropriate review question using **PICOS** - to define P = Population/participants/patients, I = Intervention, C = Comparison/comparator/control, O = Outcome of interest and S = Study design. Participants were given an opportunity to engage in very interesting hands-on exercises including how to develop search terms, build search concepts and apply the concepts built to search relevant electronic databases such as PubMed to retrieve literature, as well as how to use standard systematic review software (e.g. RevMan) to prepare and report a systematic review. Participants were taken through the whole systematic review process to prepare their own review protocols although most of the groups could not finish their protocol given

the limited time. They were encouraged to continue to work on their review protocol after the workshop and which should be further developed into a full systematic review manuscript to be submitted for publication in a peer-review journal that should go on to inform policy and practice. The training approaches group discussions, brainstorming, group work and presentation.

Training Agenda

The training workshop started on 20th May and ended on the 24th May, 2019. All participants registered on the first day of the workshop and had to sign up in all the subsequent days. Rev. Prof. Patrick F. Ayeh-Kumi, Provost, College of Health Sciences, delivered the Vice Chancellor's welcoming address followed by a statement from Prof. Gordon Awandare (Director of WACCBIP), Prof Abraham Kwabena Anang (Director of Noguchi Memorial Institute of Medical Research, and Dr Seth Amanfo (TIBA Co-ordinator). Full training agenda can be found at Annex 2.

Introduction and Course Overview

At the beginning of the workshop, all participants organizers and facilitator introduced themselves. Participants were also asked to state their expectations for the workshop. The workshop objectives were clearly outlined by the Lead Training Facilitator to ensure a common understanding among participants, and to enable a realistic evaluation at the end of the workshop to ascertain whether the course objectives had been met.

Anticipated impact of workshop

It is anticipated that TIBA partners who attend the workshop will be sensitized to the value of systematic review and start using systematic reviews evidence to inform/guide all their decisions to help accelerate outcomes improvement across countries in Africa.

Participants

Participation in this particular workshop was restricted to Principal Investigators (PIs) and Co-PIs, and mid-career scientists or policy makers from TIBA-partner countries involved in designing, implementing and evaluating strategies to improve health outcomes in Africa. There were 24 participants drawn from the following countries: South Africa (3 includes 1 from NEPAD), Botswana (2), Zimbabwe (2), Zambia (1),

Malawi (1), Tanzania (2), Kenya (2), Uganda (2), Rwanda (2), Sudan (2), Botswana (2). UK (1) and Ghana (4). See Annex 1 for participants details. Future workshops will be organized for next generation scientists, PhD and post-doctoral students, University Lecturers, Health Professionals in decision-making levels and Policy-makers working in Africa (see Annex 3 for participants details).

Facilitators

The workshop was delivered by experts with long standing experience in Evidence Synthesis and econometrics led by the University of Ghana Centre for Evidence Synthesis (UGCES) and leading Institutions from Africa and Asia. Dr Anthony Danso-Appiah, BSc, BSc (combined Hons), MSc, PGCBM, DSc, PhD, Programme Director, University of Ghana Centre for Evidence Synthesis and Policy (UGCES) and Founder and Director, Centre for Evidence Synthesis, Appraisal and Dissemination (CESAD), was the Lead Facilitator. The UGCES is a member of the Global Evidence Synthesis Initiative (GESI) Network. The other Facilitators were Prof Charles O. Obonyo from the Kenya Medical Research Institute, Center for Global Health Research, Kisumu, Kenya and Dr. Denny John, Evidence Synthesis Specialist, Campbell Collaboration, Global Development Network, New Dehli, India. See Annex 4 for details of Facilitators and Annex 5 for their bios).

Opening ceremony

Vice-Chancellor's welcoming address

The Vice Chancellor was out of the country and his statement was read by Rev Prof. Patrick F. Ayeh-Kumi, Provost, College of Health Sciences, University of Ghana as follows.

Good morning ladies and gentlemen on the high table, our very important participants and representatives from Ghana and other countries across Africa, I must say you are all very much welcome! It is my pleasure to welcome you to this special workshop with the theme – ***"Advancing Innovative, Evidence-Informed, Demand-Driven And Policy-Relevant Research For Strengthening Health Systems And Improving Patient Outcomes In Africa Through Capacity Building In Evidence Synthesis"***.

The last two decades have seen a paradigm shift in scientific research and systematic review has emerged as the gold standard for generating the best evidence upon which policy and practice can be based. Usually, the "true" evidence needed to inform decision making is scattered in a number of studies across the literature, and there is a danger, when one attempts to use the findings from a single study to inform policy decisions, as it may mislead. This is of particular concern when the individual studies attempting to answer the same research or clinical question reach different, even conflicting, conclusions. In developed countries systematically synthesized evidence is used to inform all major policy decisions, even when planning new research. Systematic review pools all relevant studies and separates poor from good quality evidence using gold standard approaches and methods.

Increasingly, policy makers and healthcare providers, even patients, in low and middle-income countries (LIMCs) are looking for quality evidence to inform their decisions and choices. However, the capacity to undertake rigorous or evidence-based research, informed by systematic reviews, is limited, particularly in Africa. At best, decision makers in LMICs are forced to rely on evidence generated in developed countries that does not necessarily apply to their settings, situations or context.

You have gathered here as scientists, health providers and policy makers from over thirteen countries across Africa - Botswana, Ghana, Kenya, Malawi, Tanzania, Rwanda, South Africa, Sudan, Tanzania, Uganda, Zambia and Zimbabwe, also NEPAD, with key responsibilities. Most of you are involved in designing, implementing or evaluating strategies to improve health outcomes in Africa. This workshop organized by the University of Ghana Centre for Evidence Synthesis and Policy (UGCES), in partnership with TIBA, undoubtedly, will equip you with the essential skills and knowledge on the theoretical foundations and gold standard approaches needed to produce the best evidence is needed to inform sound decisions about the care of the patient. These skills you acquire from this workshop will also enable you stay competitive in the global scientific community.

The University of Ghana is grateful to the funders – the UK National Institute of Health and Research (NIHR) and the University of Edinburgh-based Tackling Infections to Benefit Africa (TIBA) for supporting this workshop. I want to thank

Prof. Mark Woolhouse (Director, TIBA) and Prof. Francisca Mutapi (Deputy Director, TIBA) for their vision and support that made this workshop a reality.

I am happy to open this workshop and believe that this initiative has relevance for promoting the common good of Africa, and the University of Ghana's mission and vision, that is, promoting academic and research excellence.

Thank you.

The audio of VC's welcoming address is attached.

Statement by Prof Gordon Awandare

Prof Gordon Awandare, Ghana TIBA PI and Director of the West Africa Centre of Excellence for Cell Biology and Infectious Pathogens (WACCBIP), University of Ghana, started his statement by greeting participants and welcoming them to Ghana and said he was mainly going to talk about WACCBIP, particularly to those who had not heard about this West African Centre of Excellence. He said WACCBIP started in 2014 with support from the World Bank under the African Centres of Excellence Scheme and since the leveraged resources to attract other programmes of which TIBA is a major partner. The aim was to take the critical mass of biochemical scientist biochemistry and the NIMIRM and put together a training programme for biomedical scientists across the continent. He emphasized, the idea is that if one creates the environment in Africa that promotes teaching and learning he believes there is enough talents in the content to be able to do its own research, implement research that will solve African's own problems, forming the basis and spirit of WACCBIP. He asked of those who have heard about Kwame Nkrumah, t is in the same vein this Centre was established - to be independent and African-led. He stated "this Centre was started by us, it is for us and will forever be for us, we set our own agenda We collaborate with everyone. But we set the agenda, we decide what is important for us. Over the last five years we have given opportunities to about 200 African scientists from over 12 countries. WACCBIP believes in African led research. It is no coincidence that TIBA is partnering us to deliver African led capacity building".

Statement by Prof. Abraham Kwabena Anang

Prof Abraham Kwabena Anang, Director, The Noguchi Memorial Institute for Medical Research (NMIMR), started by saying NMIMR is a founding member of WACCBIP and employs a three point mandate: 1) To conduct research into infectious and non-infectious diseases of public health importance as we are in a global village today, diseases occurring on one side of the world is of public health importance to the other side of the world due to ease of travel worldwide. 2) To build capacity of the next generation scientists and health professionals through training and innovation. 3) To provide specialized diagnostics and monitoring services. These cannot be achieved without evidence synthesis skills and knowledge. Evidence synthesis is now a pillar to ensuring that things that are done have a catch of sustainability. He also said that the workshop would provide a unique opportunity and that participants would find at the end that they landed on a gold mine. He also said that the capacity building expertise offered by Evidence synthesis is like a magic bullet and that it only through evidence synthesis approach one of the biggest challenges confronting Africa can be solved. He challenged participants to take the Evidence Synthesis seriously.

Statement by Director, TIBA

Prof Mark Woolhouse, Director, TIBA, University of Edinburgh, UK, was Represented by Dr. Seth Appiah Amanfo, Co-ordinator, TIBA. Dr Seth Amanfo welcome participants on behalf of TIBA Director, Prof Mark Woolhouse. He said TIBA started in 9 countries in Africa but additional two countries – Malawi and Zambia- have joined through this Evidence Synthesis Workshop and urged more African countries to be involved. He used the opportunity to acknowledge the presence of Dr Janet Byaruhanga from NEPAD. He added NEPAD has been a strong collaborator with TIBA from the onset, through the application stage NEPAD gave TIBA supporting letters because NEPAD believed in TIBAS's principle of being African-led as well as the anticipated output which NEPAD believed with be of benefit to Africa. He said TIBA has been involved in other TIBA activities eg in South Africa a few weeks prior to the Evidence Synthesis workshop. TIBA is both research and training oriented with the training component training in PhD and Masters programmes, and recently launching the out of Africa fellowship of which one person from Ghana and two from Zimbabwe were in Edinburgh to spend some time research institutes there to equip themselves with some skills and return to their various countries to continue their work.

This constitute the formal training component of TIBA. A new recipient of the Out of Africa Fellowship, Dr Simon C Masha, will visit Edinburgh in September 2019. TIBA also has the informal component training, an example is the International Evidence Synthesis workshop and others, to empower the next generation of scientist and equip them with the requisite skills and together solve problems in Africa that fall under these mandates. On behalf of the Director of TIBA and the Directorate of TIBA and all the TIBA families, welcome members to Ghana

Group photo

After the opening ceremony, a group photograph was taken and the next session continued. The rest of photos can be found in Annex 6



Group photo of Facilitators, Invited Guests and Participants



Photo of Facilitators and invited Guests

Front row left to right: Prof Gordon Awandare, Prof Charles Obonyo, Prof Abraham Kwabena Anang, Rev Prof Patrick F. Ayeh-Kumi, Dr Janet Byaruhanga and Dr Tony Danso-Appiah. Standing are selected participants from 14 countries.

Workshop Modules

The Lead Facilitator, Dr Tony Danso-Appiah, presented an overview of the course content and explained the importance of equipping biomedical scientists, policy makers and health professionals in leadership roles and responsibilities with the requisite skills to be able to conduct research that will lead to health systems strengthening and patient outcomes improvement. The specific aspects covered included the following:

- Introduction to Systematic Review and the value of reliable evidence
- Formulating an appropriate review question
- Developing the review protocol
- Developing the search strategy
- Guided PubMed search and searching other databases, and managing the search output
- Selecting studies and extracting data using validated study selection and data extraction forms
- Biases and errors encountered in systematic reviews and the strategies for addressing or minimizing them
- Assessing quality of the studies included in the review by assessing the risk of bias in them using the Cochrane risk of bias tool
- Synthesis of data (qualitative and quantitative) using the most appropriate software
- Introduction to Review Manager (RevMan) and analysis of data
- Assessing sources of heterogeneity and how to address them
- Specialized systematic reviews
- Basic economic concepts and principles and types of studies
- Integrating economic evidence in systematic reviews of effectiveness
- Making sense of biomedical research

Introduction to Systematic Review

Dr Tony Danso-Appiah drew participants attention to the complexity of modern society and the increasing awareness of patients to the potential dangers of health interventions and their rights to quality care. Hence, researchers are seeking the best evidence to inform their design and conduct of new studies. With many more biomedical papers published daily, the desire to stay current with new knowledge becomes very laborious

and practically impossible. Systematic review, therefore, becomes essential to this need. Systematic Review is defined as a form of secondary research that attempts to collate all empirical evidence, meeting pre-specified eligibility criteria to answer a specific research question by distilling evidence at the highest level possible'. It implores explicit, transparent methods to identify studies, select studies, critically appraise or assess the quality of the included studies for risk of bias, extract and analyse data, report the results in a clear and accessible format, interpret the findings considering carefully any flaws in the evidence. Participants were taught that systematic review involves meticulous effort to minimize bias, consequently providing more reliable findings and conclusions. A systematic review may or may not include a meta-analysis. Meta-analysis is the statistical component of a systematic review. Dr. Danso-Appiah explained the relevance of meta-analysis at improving the statistical power to detect small to moderate intervention effects. Going through the history of Systematic review, he further explained to participants the role-played by Archie Cochrane**,** an epidemiologist who published an influential book in 1972 on "Effectiveness and Efficiency" in which he criticized the collective ignorance about the effects of healthcare by not grouping studies in specialty areas and systematically synthesizing the evidence. To honour Archie Cochrane, the Cochrane Collaboration was set up in 1993 with the first Centre in Oxford, UK. Currently, there are 14 Cochrane Centres and 19 Branches worldwide, which promote the highest form of research synthesis from randomized controlled Trials (RCTs). Dr. Danso-Appiah submitted that there is a need for more contextualized systematic reviews to tackle problems pertaining to Africa.

Formulating a Review Question

Delivered by Prof Charles Obonyo and Dr Tony Danso-Appiah. Training participants on how to formulate a review question and develop an inclusion and exclusion criteria, Prof Charles Obonyo stated that the first and foremost step in a systematic review which should flow from the problem identified and that a well-formulated review question should guide many aspects of the review process. Dr Anthony introduced a mnemonic acronym (PICOS) to serve as a framework to guide the formulation of an appropriate review question with P defining the population/participants/patients, I - Intervention, C - Comparison/comparator/control, O - Outcome and S = Study design. A well-formulated review question should drive many aspects of the review. Participants were taken through hands-on exercises on how to formulate the review title.

Developing the Review Protocol

Delivered by Prof Charles Obonyo with support from Dr Tony Danso-Appiah. In principle, every Systematic review should begin with the development of a protocol, a document that describes the concept idea and how the review will be conducted. Participants were taught that the protocol should include a background describing the condition or problem of interest, the intervention, how the intervention might work and why it is important to do this review. The protocol helps readers to judge how the planned methods will address the question of interest. It also helps reviewers to evaluate and judge how far the review fulfilled its original objectives. A good review should state how explicit, reproducible and transparent methods as well as comprehensive search strategy to identify and select studies to minimize bias would be followed. It should also state the unit of analysis, how missing data will be addressed, heterogeneity and reporting bias will be assessed, and how subgroup analysis and investigation of heterogeneity will be conducted.

Developing the Search Strategy and Boolean operators

Delivered by Dr Tony Danso-AppiahA high-quality literature search is essential for a quality systematic review. This because it is from the search results that data are gathered to answer the review question and that failure to locate important studies can significantly affect the review results. Developing a search strategy, therefore, is imperative for a systematic review. The search starts with turning the PICOS-formulated review question into a search strategy. Participants were taught how major concepts from the PICOS-formulated title with their synonyms could be used to construct the search strategy. The major concepts are then combined with Boolean operators to search relevant electronic databases using the Boolean logic. The search strategy should be sensitive and specific and should attempt to retrieve all relevant studies. The grey literature and other sources should also be searched to retrieve studies which are not published in the standard and indexed journals.

Searching electronic databases for studies

Delivered by Mr. Kwesi Sewe and Mrs Rita Oduro, Librarian and Information Specialists. It was explained that formulating a sound research question was a relevant start to the search of studies to be included in the systematic review. Kwesi advised participants to first identify concepts built from the search strategy for their search and

plan adequately towards the search. Also, he stated that all search strategies and processes should be documented in the review protocol. Mr. Kwesi expounded in details how to turn the review question into a search strategy, select most relevant database and run/search, adapt strategy as appropriate for other databases. Explaining further Kwesi and Rita indicated that PICOS is used to turn the research question in to a search strategy and reiterated that a systematic review requires a systematic search of the literature, and it involves planning the search strategy, constructing a search strategy, managing and reporting the search. Also, participants were made aware that potentially relevant studies may be found in a wide range of literature sources, such as books, government publications, policy documents and other grey literature as such searching a few databases before a systematic review is not enough. This is because it could lead to publication which will ultimately affect the review conclusions. It is, therefore, imperative when searching databases for relevant studies to have a balance between efficiency and sensitivity. It is also important to document all relevant steps when searching for studies both published and unpublished for a systematic review. Participants were taken through a practical session on how to setup and manage personal Pubmed account. He explained that Pubmed is a database used to primarily access the MEDLINE database of references and abstracts on life sciences and biomedical topics. Through the practical presentation, participants learnt in details how to carry out a search, the MeSH Terms and Boolean operators and how they could influence the search for relevant studies. Participants were advised to always search several specialized databases in addition PubMed and EMBASE. Participants were then exposed to the Endnote referencing software. Participants were taken through how to search using free text and how to manage the search output with a reference management system/software such as Mendeley, RefMan, RevMan and Endnote. This session was concluded with a step-by-step training on how to do advance search from PubMed “Advance” using Boolean logic. This session ended with participants appreciating the immense contribution of an information specialist in conducting a systematic review.

Selecting Studies and Extracting Data

Delivered by Prof Charles Obonyo. Participants were trained on how to select studies for inclusion in the review and how data from these studies should be extracted. In the selection of studies, there should be a description of how the eligibility criteria were

applied, from screening of search results through to the final selection of studies for inclusion in the review. Participants were encouraged to always use pre-tested study selection form and to report the number of people involved and whether the selection was done independently, as well as how any disagreements were resolved.

Review authors should specify how data were collected from reports of included studies. A brief description of the data items (e.g. participant characteristics, intervention details) extracted from each report is recommended. If study authors or sponsors were contacted to obtain missing information or clarify any unclear information, this should be stated. Methods for transforming or processing data in preparation for analysis including any conversions made or extracting numeric data from graphs should be described. Again, participants were asked to always use pre-tested or validated data extraction tool and describe how disagreements or discrepancies between the reviewers were addressed.

Assessing Quality of Included Studies (Risk of Bias Assessment)

Delivered by Dr Tony Danso-Appiah who started by saying, the extent to which a systematic review can draw valid conclusions about the effects of an intervention depends on whether the data and results from the included studies are valid. Problems with the design and execution of the individual studies included in the review raise questions about validity of their findings A meta-analysis of invalid studies may yield a narrow confidence interval (CI) around a misleading effect estimate. Therefore, an evaluation of quality of the included studies is an essential component of a systematic review. Participants were told that an assessment of the validity of studies included in a systematic review should emphasize the risk that they will overestimate or underestimate the true intervention effect (i.e. risk of bias in their results). Numerous tools are available for assessing methodological quality and that tools and domains specified in the protocol should be followed. For example, for randomized controlled trials (RCTs) the risk of bias in the included studies should emphasize six domains: sequence generation, allocation concealment, blinding (investigators, outcome assessors and participants), incomplete outcome data, selective outcome reporting and other sources of bias. For each domain, there is a judgment of 'low risk' of bias, 'high risk' of bias or 'unclear' risk of bias. Participants were encouraged to describe how

results of the assessments were incorporated into the analysis or interpretation of the results. Where modifications are made to these tools, they should be described in the protocol too. How the assessment was conducted, who were involved and how disagreements were resolved should be reported.

Synthesis of Data (Qualitative and Quantitative)

Delivered by Dr Denny John, Facilitator from India with support from Dr Tony Danso-Appiah. Synthesis of Data may be done qualitatively of quantitatively. The quantitative section of a systematic review is also known as Meta-analysis. Participant were introduced and trained on the statistical approaches and statistical Software available to combine studies in a meta-analysis. Participants were introduced to Review Manager (RevMan) developed by the Cochrane collaboration to assist with conducting a systematic review. Participants had a hands-on experience of how RevMan is used to perform quantitative synthesis. The participants were run through how the forest plot for meta-analysis is generated and interpreted.

Introduction to Review Manager (RevMan)

Participant were introduced and trained on the statistical components of systematic review. Dr Danso-Appiah explained that the Meta-analysis is used to summarize the results of two or more independent studies and assessing the same outcome and that by combining information from all relevant studies, meta-analyses can provide more precise estimates of effects of interventions than from the individual studies included in the review. Given that any meta-analysis is only as good as the included studies, he added that if the included studies are biased, the overall estimate though will be more precise (narrower CI), it will be around a wrong effect estimate.

Participants were introduced to Review manager, a software developed for Cochrane Collaboration, to help with preparing a protocol and for conducting meta-analysis of a systematic review. During this session participants were trained how to generate a forest plot and how to interpret the results. Dr Denny explained the relevance of pooling data. He explained that it helps to reduce type II error. Participants were also trained on how to assess heterogeneity and how to address them. Dr Denny explained, giving examples, that moderator analysis, meta regression is done to explain high values of the test of heterogeneity. All moderator of interest pertaining to a systematic review

should be decided at the protocol stage. Also, participants were taught how to do the funnel plot and interpret the results.

Sources Of Bias And Errors And how to Minimize Them

Facilitated by Dr Denny John with support from Dr Tony Danso-Appiah, he drew the attention of participants to several sources of bias which when not addressed properly could affect the reliability of the review conclusions. Examples of such biases are outcome reporting bias where a researcher may fail to report all their findings, and most likely keeping back negative results. Publication bias may occur when systematic reviewers fail to do identify all relevant studies meeting the pre-specified eligibility criteria or where some researchers engage in cherry picking their results. There could also be selection bias where some studies are selected for review while other studies which meets the inclusion criteria are excluded from the review. To reduce these biases, the participants were advised to identify all potential biases and report them in the review protocol and how these biases would be addressed. Dr Denny counseled that reviewers should document all strategies to deal with biases. He further advised that for a fact that a paper claims to be a systematic review does not mean it was done systematically. Therefore, critical appraising skills were required to identify all potential biases.

Assessing Sources of Heterogeneity and How to Address Them

Delivered by Dr Denny John. It was pointed out that the heterogeneity within and between the individual studies included in the review could come from clinical and methodological diversity and that reviewers should always explore sources of heterogeneity. Participants were taken through how to identify and address heterogeneity in systematic reviews. The classical measure for assessing heterogeneity is Cochran's Q statistics that is calculated as the weighted sum of squared differences between individual study effects and the pooled effect across studies. The I^2 statistic describes the percentage of variation across studies that is due to heterogeneity rather than chance. The facilitators expressed that in assessing heterogeneity, the I^2 should be preferred as it gives a true reflection about heterogeneity.

Basic economic concepts and Integrating economics in systematic reviews

On the fifth day of the workshop, 24th May 219, the session was dedicated to training participants on health economics and how to integrate economics in systematic reviews. This was facilitated by Dr Denny John. He defined health economics as the branch of economics that evaluates health care, provides a logical and explicit framework that enables healthcare providers, governments, decision makers and society to make choices as to how best to use resources to plan health services. Dr Denny explained that health economics evaluates costs and consequences of health care interventions, such as drugs, devices, procedures, services and programs. Participants were introduced to the basic economic terms and concepts such as equity, cost effectiveness, efficiency, cost effective quadrants, measures of benefits, equity tradeoffs, etc. Also, participants were introduced to economic principles and methods and types of studies that could be included in health economic reviews. Touching on integrating economic methods in systematic reviews, Dr Denny taught the participants a lot about the Consolidated Health Economic Evaluation Reporting Standards (CHEERS). In His explanation, the purpose of this standard is to ensure that reviewers and readers assess the appropriateness of the methods, assumptions, data used in the study, and to assess the credibility of the results and the sensitivity of the results to alternative data choices. It also ensures that we have conclusions that are supported by the study results. The CHEERS provides a checklist of 24 items to include when reporting an economic evaluation of a health intervention.

Making Sense of Biomedical Research

Facilitated by Dr Tony Danso-Appiah, he explained that to make sense of biomedical research the type of study design, their strengths and limitations, risk of bias and the statistical component of research should be appreciated by all participants. Elaborating on the statistics and effects measures participants were taught the types of outcome data, types of effect measures, and relevance and use of risk and odd ratio in biomedical studies. In explaining the usefulness of the confidence interval, Dr Danso-Appiah said our effect estimate (i.e. relative risk or odds ratio) represents our best guess of the impact of the intervention and that the confidence interval expresses the range of values around the effect estimate which contain the 'true effect'. A 95% confidence interval is based on the idea that if the study was repeated many times in samples drawn from the same population, 95% would include the true value of the effect. Participants were

taken through how to express effect estimates in words in lay language and common misinterpretation of the p-value. At the end of the session, participants appreciated how misinterpretation of the P-value could influence the study conclusions and trustworthiness.

Review protocol Presentation

Participants presented their review protocols for discussion and deliberation. This session was fascinating and thought-provoking and offered the opportunity for participants and faculty to share ideas and interact on ways to improve their systematic reviews. At the end of this period, participants gained an in-depth knowledge on systematic reviews and were encouraged to continue to develop their protocols into a full review that should be submitted for publication in peer-reviewed journals.

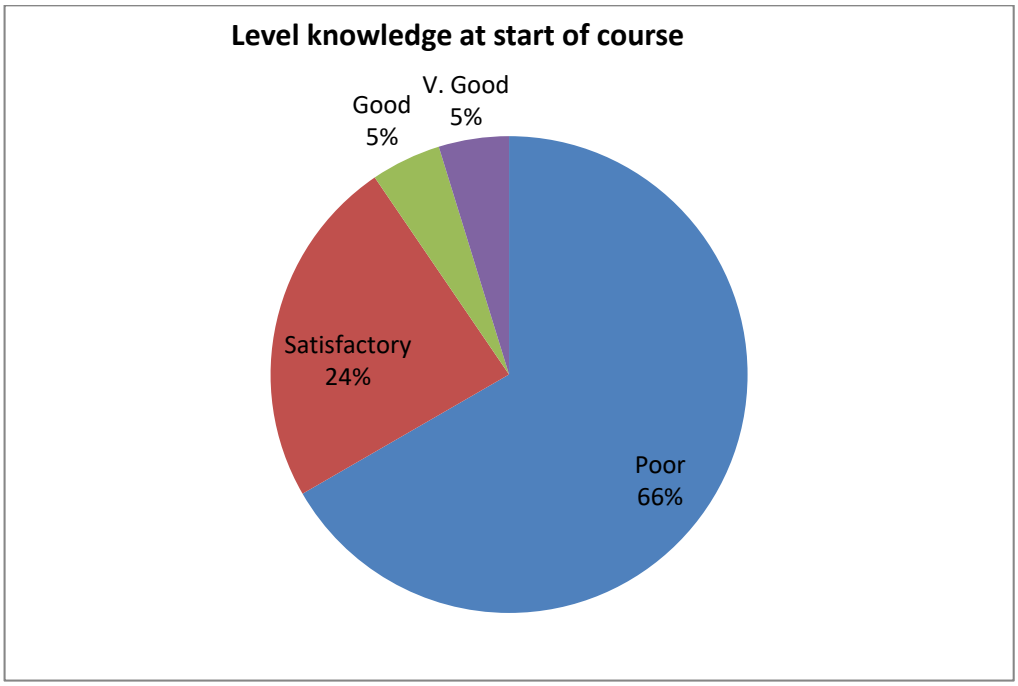
Closing ceremony

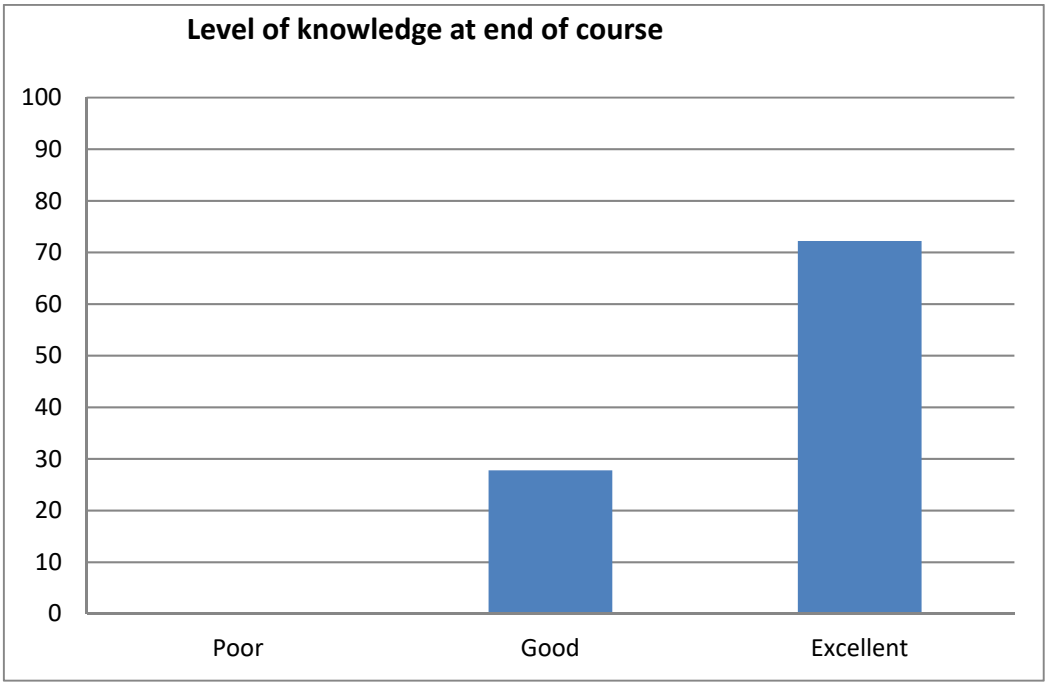
The workshop came to an end at 5:00pm on Friday 24th May 2019. Rev. Prof Patrick F. Ayeh-Kumi delivered his closing remarks and admonished participants to go back to their various countries and institutions as ambassadors sensitized to promoting innovative, evidence-based, demand-driven and policy-relevant research to strengthen health systems and improve patient outcomes in Africa. Participants were then presented with certificates. Participants in turn expressed their gratitude about the gravity of information they had received and the opportunity to be part of shifting era of scientific research in Africa and promised to work closely with one another to promote rigorous research across Africa.

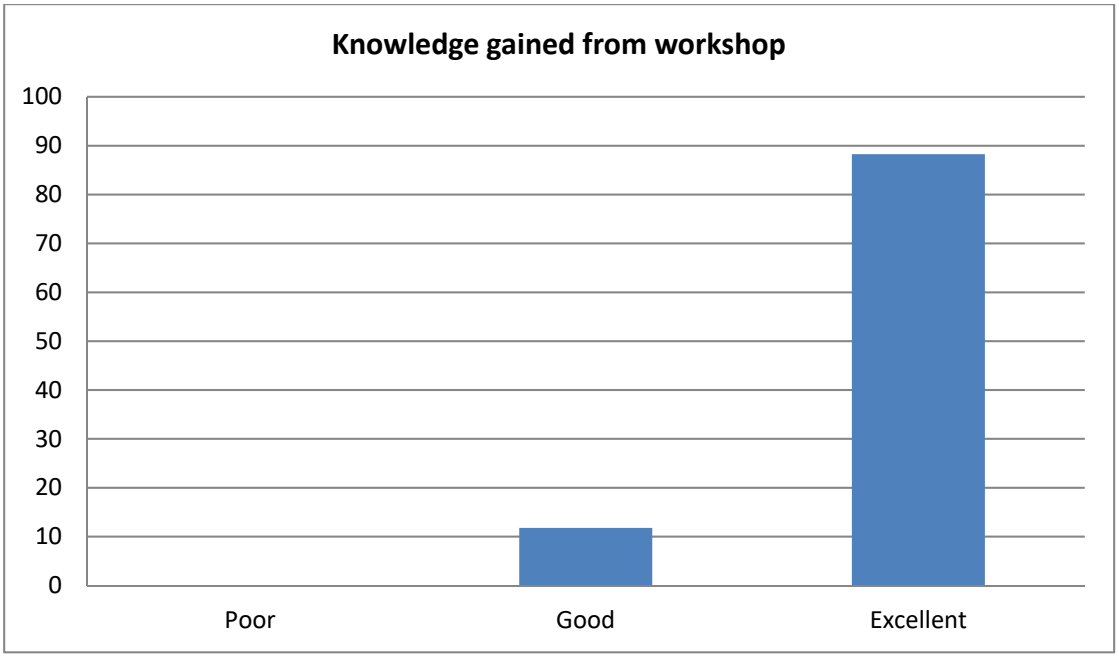
Participants' Evaluation of the Workshop

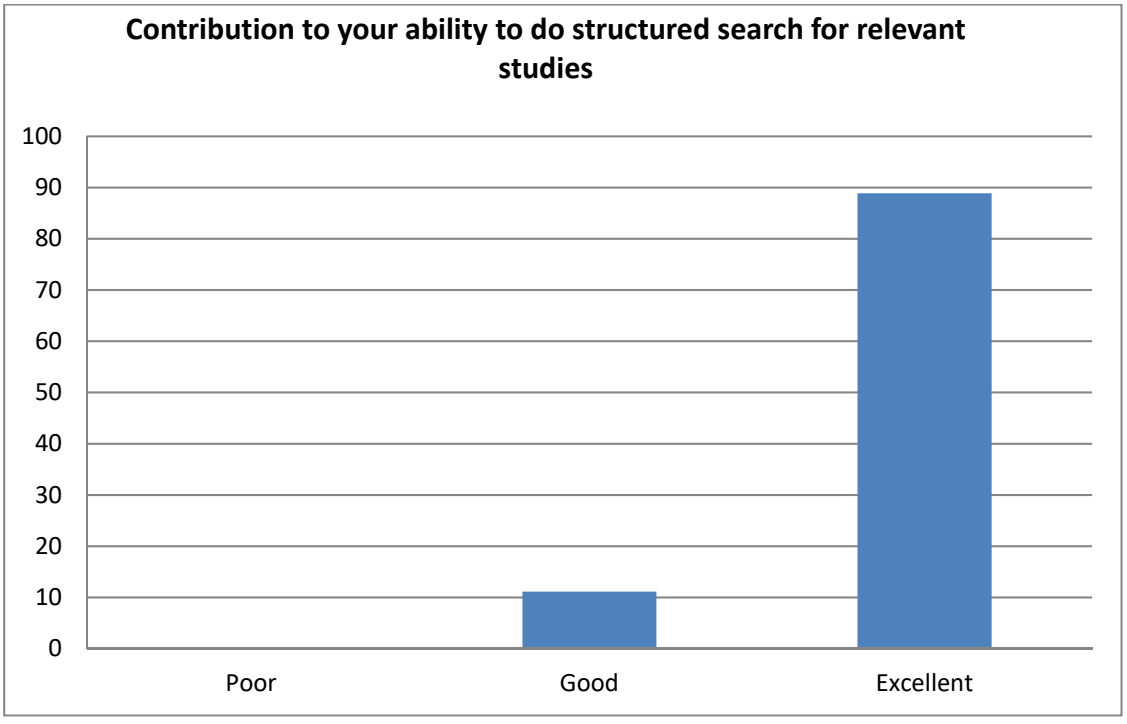
Participants were the opportunity evaluate the workshop by rating on a scale of Poor, Satisfactory, Good, Very Good and Excellent. They were also given the opportunity to write comments but not supposed to write their names or anything that would serve as a lead to identify them. The analysis of their responses has been presented below.

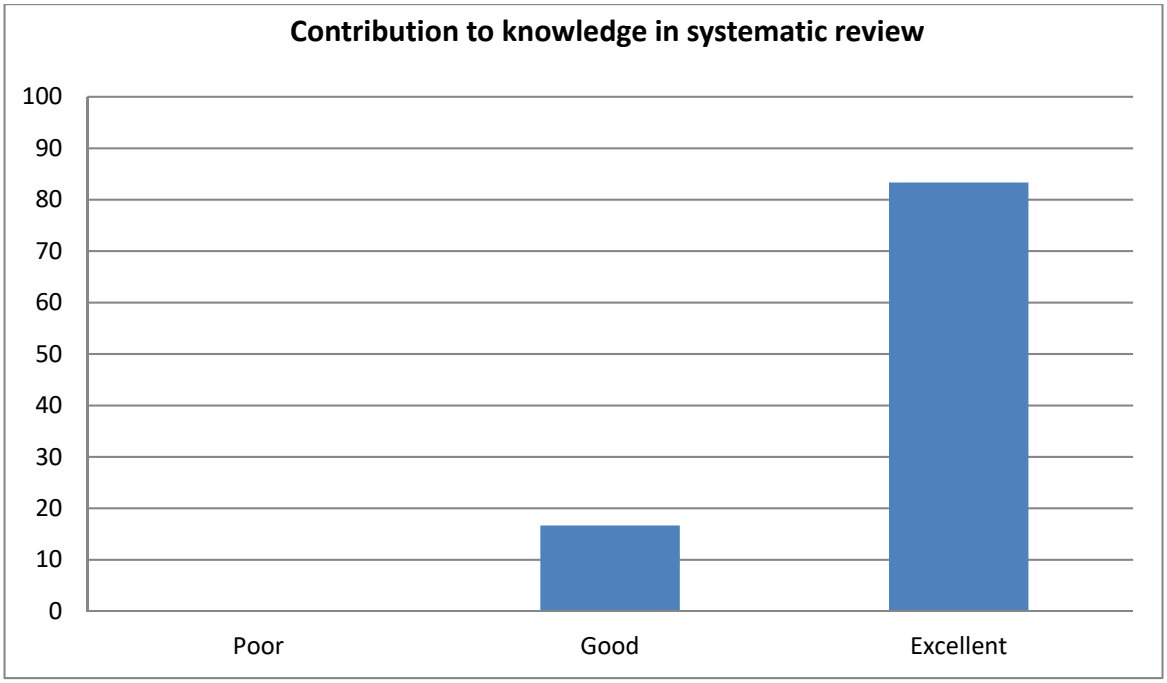
Evaluation Results






Knowledge gained from workshop
100
90
80
70
60
50
40
30
20
10
0
Poor
Good
Excellent


Contribution to your ability to do structured search for relevant studies
100
90
80
70
60
50
40
30
20
10
0
Poor
Good
Excellent



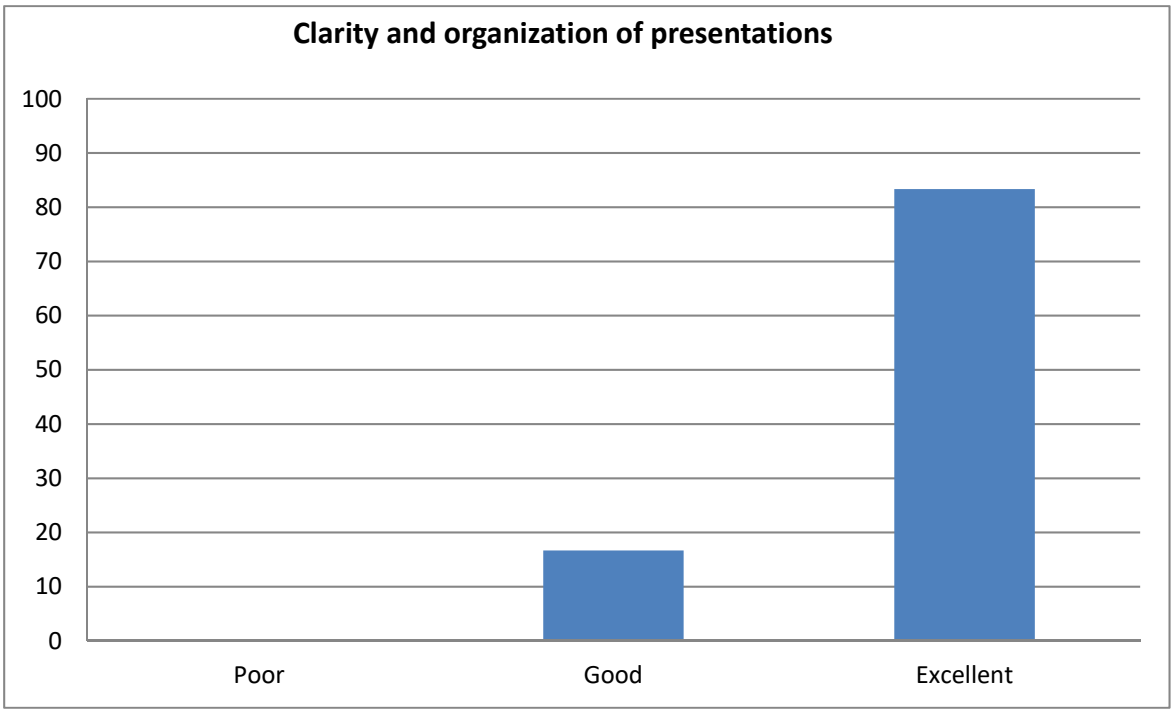


Fig. Exposure to new and useful resources (websites, databases etc)



Participants were also asked to rate the specific modules below and although these were rated very highly, the results have not been reported here.

- Introduction to Systematic Review
- Formulating a Review Question
- Developing the Review Protocol
- Developing The Search Strategy
- Guide to PubMed Search and Other Databases
- Selecting Studies and Extracting Data
- Biases, Errors and Strategies for Minimizing them
- Assessing Quality of Included Studies (Risk of Bias Assessment)
- Synthesis of Data (Qualitative and Quantitative)
- Introduction to Review Manager (REVMAN)
- Assessing Sources of Heterogeneity and How to Address Them
- Making Sense of Biomedical Research
- Knowledge on Systematic Review before workshop
- Knowledge on Systematic Review after workshop
- Overall impression of the training
- Assessment of Facilitators

Annex 1

Immediate output

Participants worked independently following standard systematic review principles and methods to prepare and present drafts of their systematic review protocols on various topics/questions identified in their specialty areas. The review protocol titles generated are listed below.

1. Complimenting mass drug administration (MDA) of Ivermectin with vector control through larviciding in fast flowing in rivers in endemic African countries

   Review question: Would complimenting mass drug administration (MDA) of Ivermectin with vector (Simulium) control through larvicide application in rivers be more effective at reducing parasite prevalence and intensity of transmission of Onchocerciasis compared to MDA of ivermectin alone in endemic communities where parasite infection is not yet eliminated despite over 20 decades of implementation MDA alone?

2. Effectiveness of integrated and exchange methods of policy engagement in promoting evidence informed decision making in health

   Review question: Do integrated and exchange methods such as joint knowledge synthesis, researcher secondment and policy maker secondment improve evidence informed decision making in health?

3. Investigating the most impactful health education model in reducing prevalence and intensity of soil transmitted infections among children under five

   Review question: What is the most impactful health education model in reducing prevalence and intensity of soil transmitted infections among children under five?

4. The impact of integrating insecticide-treated bed nets with larvicides on malaria transmission in Sub Saharan Africa: A systematic review and Meta-Analysis

Review Question: Does integrating insecticide-treated nets with larvicides have impact on malaria transmission in Sub Saharan Africa?

5. Operational challenges in implementing Mass Drug Administration within the preventive chemotherapy strategy for schistosomiasis in sub-Saharan Africa: systematic review and meta-analysis

   Research question: What factors hinder the implementation of MDA for schistosomiasis in SSA?

6. Investigating the impact of live bait technology combined with trypanocidal treatment on the prevalence of T.b. gambiense parasites in domestic animals.

   Review Question: What is the impact of live bait technology combined with trypanocidal treatment on the prevalence of *T.b.gambiense* parasites in domestic animals?

7. Effect of vitamin E at reducing the risk of cardiovascular events in patients with coronary heart disease

8. The added benefit of integrated WASH interventions plus iron containing multiple micronutrient powders compared with WASH alone in reducing iron deficiency anaemia among children 4-23 months in Sub-Saharan Africa: synthesis of the evidence from RCTs

   Review question: What is the added benefit of integrated WASH interventions plus iron containing multiple micronutrient powders compared with micronutrient powders alone in reducing iron deficiency anaemia among children 4-23 months in low resource settings?

9. The benefits of Praziquantel and micronutrients (Iron, Zinc) treatment in comparison to praziquantel in paediatrics (≤5 years old) living in an area endemic to *Schistosoma haematobium* infection

10. Effectiveness and cost-effectiveness of integrating HPV vaccine for prevention of cervical cancer and its precursors for adolescent girls in HIV care programs in LMICs: A systematic review

    Review question: What are the benefits and cost effectiveness of integrating HPV vaccine for prevention of cervical cancer and its precursors in the care of HIV care programs for adolescent girls'?

11. Effects of using Canabis on the PKPD of ARV's among adults on HIV treatment?

12. Geographical distribution of J Zymodema among different Leishmania parasites and hosts

13. Early life exposure to parasites and effects on cognition: systematic review and meta-analysis

14. Pathogen induced acute febrile illness in children and its implications in effective diagnosis

15. Malaria diagnosis: Comparison of RDT's, molecular and microscopic detection of multiple species infection

16. Is complementing mass drug administration (MDA) of Ivermectin with vector control strategy more effective at reducing Onchocerciasis parasite prevalence compared to MDA of Ivermectin alone in endemic communities?

17. What are the effects of paediatric schistosomiasis on the socioeconomic development of Sub-Saharan African countries where the disease is prevalent?

18. Treatment coverage of chemotherapy prevention NTD mass drug administration programs in Sub-Saharan Africa

19. Environmental impacts of molluscicides use in controlling vector-borne diseases: systematic review and meta-analysis

20. Efficacy of Rotavirus vaccines in Africa: synthesis of the evidence

21. What is the best methods of conducting community mass drug administration for lymphatic Filariasis elimination in urban areas/ setting in sub-Saharan Africa?

22. Which interventions for reducing anaemia in children under 5 years works in Africa

23. The effect of mixed feeding on effective weaning in infants

Long-term output

Participants will build on their knowledge with the support of the facilitators and complete a full systematic review (and meta-analysis) for submission to a peer-reviewed journal for publication and to create critical mass of biomedical scientists, health professionals and policy makers sensitized to the value of gold standard approaches and tools used, and advance innovative, evidence-informed and policy-relevant research that will strengthen evidence-based healthcare delivery.

Annex 2

Workshop agenda

Opening ceremony

Time:	9:00am -5:00 pm
Date:	20th May 2019
Venue:	WACCBIP…, University of Ghana, Legon, Accra

Time	Activity	Name
8:00-9:00am	Registration	Participants
9:00-9:05am	Opening prayer	Amans Ntakarutimana
9:05-9:10am	Objectives of Workshop by UGCES Programme Director	Dr. Tony Danso-Appiah
9:05-9:20am	Welcome address by Vice-Chancellor, University of Ghana	Rep. Rev. Prof. Patrick F. Ayeh-Kumi, Provost, CHS, UG
9:20-9:25am	Statement by TIBA PI and Director, West Africa Centre of Excellence for Cell Biology and Infectious Pathogens (WACCBIP), UG	Prof. Gordon Awandare
9:25-9:30am	Statement by Director, Noguchi Memorial Institute for Medical Research (NMIMR)	Prof. Abraham Kwabena Anang
9:30-9:35am	Statement by Director, Tackling Infections to Benefit Africa (TIBA), University of Edinburgh, UK	Rep. Dr. Seth Appiah Amanfo
9:35-9:40am	Closing prayer	Amans Ntakarutimana
9:40-10:00am	**Group photo**	All

Day 1

Time	Activity	Facilitator
10:00-10:30	Introduction of participants and facilitators	TDA
10:30-10:45	**Coffee/Tea break**	All
10:45-12:00	Introduction to Systematic Review - Evidence Synthesis	TDA
12:00– 13:00	Formulating the review question and developing the inclusion and exclusion criteria	COO
13:00-14:00	**Lunch break**	
14:00-16:00	Developing the review protocol	COO/TDA
16:00-17:00	Hands on exercise: participants formulate their review questions using PICOS	TDA

Day 2

Time	Activity	Facilitator
9:00-9:30	Recap of Day sessions	TDA
9:30-11:00	Developing the search strategy - concept building	TDA
11:00-11:15	**Coffee/Tea break**	**All**
11:15-13:00	Hands on exercise: guided PubMed search and managing the search output (eg. Endnote)	KS/ROA/TDA
13:00-14:00	**Lunch break**	
14:00-15:30	Selecting studies and extracting data	COO
15:30-17:00	Participants work on their Protocols	TDA/COO/DJ

Day 3

Time	Activity	Facilitator
9:00-9:30	Recap of previous sessions	All
9:30-11:00	Common sources of bias and errors and strategies for minimizing/addressing them	DJ
11:00-11:15	**Coffee/Tea break**	
11:15-13:00	Assessing quality of the included studies - risk of bias assessment	TDA
13:00-14:00	**Lunch break**	All
14:00-15:30	Synthesis of data - qualitative and quantitative (meta-analyses)	TDA
15:30-16:30	Introduction to Review Manager (RevMan)	COO/DJ
16:30-17:00	Participants work on their protocols	TDA/DJ/COO

Day 4

Time	Activity	Facilitator
9:00-9:30	Recap of previous sessions	All
9:30-11:00	Assessing sources of heterogeneity and how to address them	TDA
11:00-11:15	**Coffee/Tea break**	
11:15-13:00	Specialized systematic reviews • Systematic reviews of prevalence and incidence studies • Diagnostic test accuracy • Others	DJ TDA COO/DJ
13:00-14:00	**Lunch break**	All
14:00-16:00	Basic economic concepts, principles and types of studies	DJ
16:00-17:00	Participants work on their protocols	TDA/DJ/COO

Day 5

Time	Activity	Facilitator
9:00-9:30	Recap of previous sessions	All
9:30-11:00	Integrating economic methods in systematic reviews	DJ
11:00-11:15	**Coffee/Tea break**	**All**
11:15-12:30	Making sense of biomedical research	TDA
12:30-13:00	Finalizing power point presentation of review protocols	TDA/COO/DJ
13:00-14:00	**Lunch break**	
14:00-16:45	Participants present their protocols	TDA/COO/DJ
16:45-17:00	Closing remarks and Presentation of certificates	Rev Prof. Patrick F. Ayeh-Kumi, Provost, CHS, UG

TDA= Tony Danso-Appiah, COO= Charles O. Obonyo, DJ= Denny John, KS= Kwesi Sewe, ROA= Rita Oduro Anane

Annex 3

List of Participants and their details

NO.	ORGANIZATION/DESIGNATION	COUNTRY	TELEPHONE NUMBER
1.	Dr Tuduetso Molefi (nee Monagen)	Botswana	tmonagen@gmail.com
2.	Maitshwarelo Matsheka	Botswana	MMatsheka@bitri.co.bw
3.	Dr Gloria Amegatcher	Ghana	gloria.amegatcher@gmail.com
4.	Dr Joe Mutungi	Ghana	joemutungi@gmail.com
5.	Dr Simon C Masha	Kenya	schengo@gmail.com
6.	Alex Njeru	Kenya	ANjeru@kemri-wellcome.org
7.	Steve Manyozo	Malawi	derrickmanyozo@gmail.com
8.	Dr Nadine Rujeni	Rwanda	nrujeni@gmail.com
9.	Amans Ntakarutimana	Rwanda	ntamans1@gmail.com
10.	Dr Lihle Qulu	South Africa	Qulul@ukzn.ac.za
11.	Hlengiwe Sacolo Gwebu	South Africa	hnsacolo@gmail.com
12.	Dr Elwaleed Mohamed Elamin	Sudan	wmelamin@hotmail.com
13.	Dr Sarah Ibrahim Abdelatif	Sudan	sursur555@gmail.com
14.	Akili kassinga Kalinga	Tanzania	kalingaaka@yahoo.com
15.	Cecilia Henry Uisso	Tanzania	ceciuisso@gmail.com
16.	Dr Peter Waiswa	Uganda	pwaiswa4@gmail.com
17.	Dr Fredrick George Kabale	Uganda	fredrickkabbale@yahoo.co.uk
18.	Dr Mwansa K. Lubey	Zambia	mwansaketty@gmail.com
19.	Bernard Ngara	Zimbabwe	bernardngara4@gmail.com
20.	Theresa Chimponda	Zimbabwe	therytimothy@gmail.com
21.	Seth Amanfo	UK	seth.amanfo@ed.ac.uk
22.	Dr Janet Byaruhanga	South Africa	JanetB@nepad.org
23.	Morrison Asiamah	Ghana	morrisonasiamah2012@gmail.com
24.	Benedicta Kessewah Addo	Ghana	maamekessewah95@gmail.com

Annex 4

Details of main Facilitators

NAME OF FACILITATOR	ORGANIZATION	CONTACT
Dr. Tony Danso-Appiah Programme Director, University of Ghana Centre for Evidence Synthesis and Policy (UGCES); Founder and Director, Evidence Synthesis, Policy and Guidelines Africa	University of Ghana Centre for Evidence Synthesis and Policy (UGCES) / Evidence Synthesis Policy and Guidelines Africa	tdappiah@yahoo.co.uk; adanso-appiah@ug.edu.gh +233 269083789 +44 7958721346
Prof. Charles O. Obonyo	Centre for Global Health Research Kenya Medical Research Institute P.O. Box 1578, KISUMU, KENYA 40100	Cellphone: +254 724993118 Email 1: cobonyo65@yahoo.com Email 2: cobonyo65@gmail.com Email 3: cobonyo@kemri.org
Dr. Denny John, Evidence Synthesis Specialist	Campbell Collaboration, Global Development Center, Dehli, India	djohn@campbellcollaboration.org Mobile: 00-91-9987021553 Twitter:@djohn1976 Skype: djohn1976 https://campbellcollaboration.org/southasia/

Assistants Facilitators

Mr Kwesi Sewe and Mrs Rita Oduro, University of Ghana Library and Information Services, Accra

Annex 5

Bios of Facilitators

Lead Facilitator

Dr Tony Danso-Appiah, BSc, BSc (Combined Hons), MSc, PGCBM, DSc, PhD,)has over 20 years of experience in evidence-based approaches and health systems strengthening, leading a number of commissioned systematic reviews and meta-analyses for WHO and other leading institutions, which have changed national and global policies. He worked in the Netherlands and UK and recently moved to Ghana to help build capacity of scientists, health professionals and decision makers in the gold standard approaches used to generate the best evidence decision makers need for sound policies across countries of Africa. His current duties and responsibilities include teaching, evidence-based healthcare curriculum development and supervision of graduate (PhD, MPhil, MPH and MSc) and undergraduate theses; co-ordinate the Department of Epidemiology's PhD programme; and run Train-The-Trainer workshops on the foundations and tools for evidence-based healthcare and policy, targeted to PIs and Co-PIs, policy makers, university lecturers, post doc students, and health professionals. Outside his primary duties and responsibilities, he set up and leading the University of Ghana Centre for Evidence Synthesis and Policy (UGCES), a member of the Global Evidence Synthesis Initiative (GESI) Network building capacity of scientists sensitized to quality evidence and who should be able to translate scientific research evidence into evidence-based guidelines, practice and policy across Africa. He developed, and facilitates Evidence-based Medicine (EBM) course hosted by the Ghana College of Physicians and Surgeons (GCPS), already training over 500 specialist doctors in Ghana, and developed Evidence Synthesis course for the University of Ghana Doctoral School to train the university's PhD students in Evidence-based Research (EBR). He is a member of the Committee set up to streamline research between the Office of Research, Innovation and Development (ORID) with Colleges and Centres in the University of Ghana and a member of the College Academic Board. He serves as a Consultant on The Noguchi Memorial Institute for Medical Research (NMIMR) board, a top medical and research institute in the sub-region, mentoring research fellows and post doc students on how to do evidence synthesis and evidence-

based research. Dr Danso-Appiah represents the UK on the European Cooperation in Science and Technology (COST) Action, Evidence-based Research (EVBRES CA17117) Working Group, developing "Training School" and teaching Evidence-based Clinical Health Research to clinicians in European Health Facilities and Systems (2018 to 2022).

From 1998 to 2013, he worked in the Netherlands and UK in various capacities; as Research Fellow in Evidence Synthesis at the Centre for Review and Dissemination (CRD), University of York, UK where he conducted systematic reviews and Health Technology Assessment (HTA) on technologies (medicines and surgical procedures etc) intended to be introduced into the UK National Health Service (NHS) and using Critical Appraisal Skills prepared several Evidence Briefs from systematic reviews published on the DARE database for access by doctors, patients and the general public); as Research Fellow and Methodologist in Clinical Evidence at the National Collaborating Centre for Women's and Children's Health (NCC-WCH), London, leading evidence generation for clinical guidelines development for the National Institute for Health and Care Excellence (NICE); as West Africa Co-ordinator at the Liverpool School of Tropical Medicine, UK, promoting the use of quality evidence for policy and practice across countries of West Africa; and Consultant Systematic Reviewer preparing commissioned systematic reviews mainly for WHO. He spent a number of years (1998-2004) in the Department of Public Health, Erasmus University Medical Centre, Rotterdam, Netherlands, investigating health interventions in low and middle-income countries (LMICs), using various evidence-based approaches and tools. Dr Danso-Appiah led a number of multi-disciplinary and commissioned systematic review and meta-analyses, which directly influenced global policies; he has served as WHO Advisor and consultant for a number of years and sat on several National and International Advisory and Technical Boards. He is a member of the Systematic Review Editors Training and Learning Initiative for Experienced Authors (LIXA); member of the International Society for Evidence-based Healthcare and Africa Evidence Network, Association of Schools of Public Health in Africa (ASPHA), The Campbell Collaboration and Global Evidence-based Research. He is a Working Group Member of the Guidelines International Network (GIN)'s Low and Middle Income Countries strand and the Cochrane Africa Network focal person for Ghana. He has peer-reviewed for several biomedical journals including very high impact factor journals

such as the BMJ, Lancet and PLoS. His current interests include building capacity of scientists, health professionals and decision makers in the gold standard approaches used to generate the best evidence decision makers for advancing innovative, evidence-informed, demand-driven and policy-relevant research to strengthen capacity for evidence-based healthcare delivery

Prof Charles Obonyo

Dr Denny John

Denny John, MBA, MPH, PT

Denny is currently working as Evidence Synthesis Specialist, Campbell Collaboration, and is placed at Global Development Network (GDN) Head Office, New Delhi. He has experience of working with development organisations and consulting companies for conducting cost-effectiveness analysis, systematic reviews and epidemiological forecasting studies. He has experience of working in healthcare delivery and community health projects in India and Nepal, and provided technical support for projects in Bangladesh, Tanzania, and Nigeria. He has been the Principal Investigator/Co-Investigator for over 15 research studies conducted across various states in India, and has been awarded several research and project grants from national and international bodies. Denny has published over 25 articles in peer-review journals, book chapters, and technical reports in the field of health financing, systematic reviews & meta-analysis, cost effectiveness analysis, and implementation research. He is one of the co-authors of the first 'Pharmacoeconomicsand Outcomes Research Guidelines for India', and currently collaborating with academics on developing 'Economic Evaluation Guidelines for Vaccines in India'. He is a reviewer for International Journal for Technology Assessment in Healthcare, Value in Health-Regional Issues, Patient Experiences Journal, Medical Decision Making and reviews of the Cochrane Collaboration. He has a MBA in Hospital Management from Institute of Health Management Research (IIHMR), Jaipur, Master of Public Health (MPH) from University of Auckland, New Zealand, and Bachelor of Physiotherapy from Mangalore University. He is Fellow of Royal Society of Public Health, UK, and Royal Society of

Tropical Medicine and Health, UK, and is the Chair-Elect for ISPOR Asia Young Professionals Group (2015-17). Denny aims to spread the knowledge and build capacity towards evidence synthesis, and economic evaluation, and wider uptake of evidence-based health policy in developing countries such as India.

Annex 6

Workshop photos



Photo showing section of participants during workshop











Facilitator during the training workshop

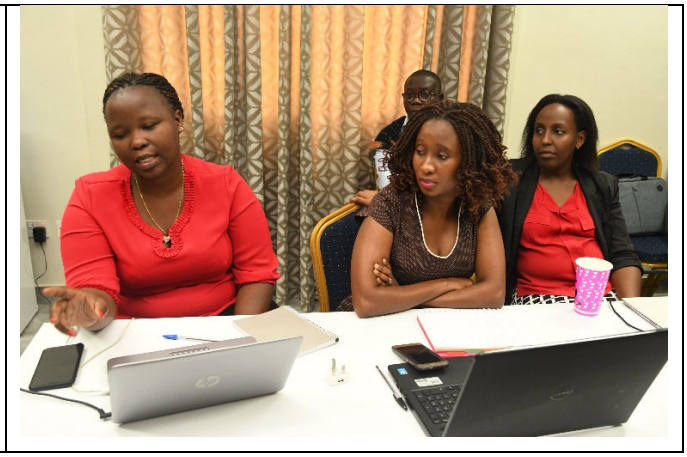
Facilitator during the training workshop





Facilitator during the training workshop

Facilitator consulting during the training workshop

Participants during the workshop





During hands-on-exercise


Participants from WACCBIP



Facilitators and participants share special moments



Visit to the Noguchi Memorial Institute for Medical Research

Independent report by Participants

REPORT OF THE PARTICIPANTS IN THE WORKSHOP ON ADVANCING INNOVATIVE, EVIDENCE-INFORMED, DEMAND-DRIVEN AND POLICY-RELEVANT RESEARCH FOR STRENGTHENING HEALTH SYSTEMS AND IMPROVING PATIENT OUTCOMES IN AFRICA THROUGH CAPACITY BUILDING IN EVIDENCE SYNTHESIS HELD ON 20TH-24TH MAY, 2019 AT THE UNIVERSITY OF GHANA CENTRE FOR EVIDENCE SYNTHESIS AND POLICY

The Vice-Chancellor and staff, University of Ghana,

The Director Noguchi Memorial Institute for Medical Research,

Ghana TIBA PI and Director of the West Africa Centre of Excellence for Cell Biology and Infectious Pathogens,

The Director, Tackling Infections to Benefit Africa (TIBA), University of Edinburgh,

The workshop organizer and Centre (UGCES) Director, Dr. Tony Danso-Appiah and

All the facilitators (Prof. Charles Obonyo, Dr. Denny John, Madam Rita and Mr. Kwesi)

Appreciations

We express our sincere gratitude for the warm reception given to all of us from the time we arrived here to the end of the training workshop. We thank you for giving us such a big opportunity to acquire knowledge and skills on Evidence Synthesis.

Workshop Participants

Participants came from the following African countries: South Africa (3 includes 1 from NEPAD), Botswana (2), Zimbabwe (2), Zambia (1), Malawi (1), Tanzania (2), Kenya (3), Uganda (2), Rwanda (2), Sudan (2), Botswana (2), UK (1) and Ghana (4).

Summary of Training Content

The following were covered during the training workshop including hands on exercises:

- Introduction to Systematic Review-Evidence Synthesis
- Formulating the review question and developing the inclusion and exclusion criteria
- Developing the review protocol
- Hands on exercise on formulating review questions using PICOS
- Developing the search strategy: Concept building
- Hands on exercise on Pub Med search and managing the search output (Endnote)
- Selecting studies and extracting data
- Common sources of bias and errors and strategies for minimizing them
- Assessing quality of the included studies: Risk of bias assessment
- Synthesis of data-qualitative and quantitative (Meta-Analyses)
- Introduction to Review Manager (RevMan)
- Assessing sources of heterogeneity and how to address them
- Specialized systematic reviews: Systematic reviews of prevalence and incidence studies; Diagnostic test accuracy and others
- Basic economic concepts, principles and types of studies
- Integrating economic methods in systematic reviews
- Making sense of biomedical research
- Presentation and discussion of participants' review protocols

Participants' Achievements

Participants have been equipped with information, knowledge and skills to undertake rigorous and reliable policy-relevant research, applying evidence synthesis skills and on how to prepare systematic reviews for publication in peer-reviewed journals. The Key output of the training workshop is a Systematic Review Protocol by each of the participants. Networks and collaboration links have been established among the participants, and with institutions.

Way Forward

Participants will produce evidence synthesized through their Systematic Review reports, and will contribute to building research capacity in Africa and strengthening health systems and improving patient outcomes through capacity building in Evidence Synthesis and conducting policy-relevant research. There is the need for advocacy to policy making and development partners for the uptake of evidence-based research results for cost effectiveness of interventions. Established networks and collaboration links should be maintained as we work in a team to transform Africa swiftly.

Participants' Request

Participants kindly request for a follow up workshop in the near future with the aim of getting more hands on training, mentorship and close supervision and backstopping at the centre for evidence synthesis and policy. This will enable us to finally produce the intended outputs-Systematic review reports for publication and dissemination. An advanced training course in Evidence Synthesis will also be highly appreciated.

Once again, we extend our gratitude and appreciations to the sponsors and organizers of this very important and highly beneficial training workshop.

The Workshop Participants

Chaired by:



DR.

KABBALE FREDRICK GEORGE

Bios of participants

Dr Gloria Amegatse



I am a diligent and companionable young researcher with interest in infectious diseases ,diagnostic and prognosis research. I have provided diagnostic medical laboratory services in the areas of Microbiology, Chemical Pathology, Haematology, Immunology and Endocrinology for the past 18 years in a hospital. I am a Clinical Tutor at the Department of Medical Laboratory Sciences in the School of Biomedical and Allied Health Sciences, University of Ghana; Legon. Currently, I am a postdoctoral researcher at the Department of Biochemistry, Cell and Molecular Biology, University of Ghana.

BIOGRAPHY



Email Address: hnsacolo@gmail.com **Contact Number:** +27 63 547 1981.

Full name: Dr. Hlengiwe Sacolo Gwebu

Nationality: South African

Gender: Female

I am an applied researcher who draws from her experience in health systems research, program designing and evaluation to address real societal problems particularly in vulnerable communities. I hold a PhD in Public Health where I specialized in infectious disease epidemiology focusing on schistosomiasis and soil-transmitted helminths (STH) among children aged under 5 years. The study was designed to provide innovative and context specific solutions to addressing schistosomiasis and STH in typically rural and poor endemic areas. Prior to pursuing doctoral studies, I had worked in (i) healthcare systems, (ii) tertiary education as a lecturer and (iii) with a multilateral organization (UNFPA). The capacity building workshop entitled "Evidence synthesis for advancing innovative, evidence-informed, demand-driven and policy-relevant research in Africa", has equipped me in becoming an innovative leader in evidence synthesis. It has improved my scientific and educational productivity which will ensure that more demand driven systematic reviews are published and visible to policy makers and researchers. It has also placed our community of young researchers on a path of sustainable growth for future leadership roles in academia, research institutions or related organizations locally and abroad. The systematic review related knowledge and skills acquired from the evidence synthesis workshop will be transferred to the next generation scientists to widen the pool of applied science researchers who are needed to serve nations.

BIO-Dr. Mwansa Ketty Lubeya



Dr. Mwansa Ketty Lubeya is an Obstetrics & Gynaecology specialist, faculty at The University of Zambia-School Medicine. She has more than 11 years of post-qualification experience, with administrative skills at different levels.

Dr. Lubeya is a 2017 Mandela Washington Fellow, which is a flagship programme for outstanding Young African Leaders Initiative (YALI) https://yali.state.gov/mwf/ . Her selection was in recognition of her community initiative in cervical cancer prevention https://www.facebook.com/NamayoWaBumi1/ and her proven leadership record. In 2018, she was named as one of the 2018 inaugural Obama foundation: Africa Leaders cohort https://www.obama.org/updates/leaders-program-africa/ .

Dr Lubeya is an active member of her professional body (Zambia Association of Gynaecologists and Obstetricians) and is the inaugural Editor-in- chief for professional body's newsletter www.za-go.org

In August 2018, as a passionate researcher and seasoned mentor, Dr Lubeya co-founded the YES research mentorship program. This is with a background that, despite mentorship being proven to be a useful tool in the developed world for scientific progression, in low- and middle-income countries (LMICs) there is lack of recognised sustainable mentorship programs for young emerging scientists https://www.yeszambia.com/ .

Mwansa knows and understands that in order to change the African narrative, she has to roll up her sleeves and be involved.

Here is her synthesis of her experience with the Evidence synthesis course

Attending the Evidence synthesis training in Accra Ghana came at a perfect time as I seek to grow in my research career. For the very first time in my professional life, I was exposed to this rich information. I have come to know about the rigorous process of systematic reviews, with carefully selected studies meeting a particular PICOS/ PEO and ultimately this strengthens the practice of evidence-based medicine. I have also reinforced my knowledge on the fact that a single study may not show the true population effect due to factors related to both internal and external validity. It was so awesome to get to do my own forest plot with dammy data!

I would recommend that more time to be allocated to this critical training, especially at this second wave of African independence. The course needs more in person contact with the trainers, at least 6 weeks total (Could be in parts, physical and online assignments and webinars) so that participants can have firm Knowledge. Having a compressed course may serve only to sensitize and not to educate and create a pool of

well-grounded systematic reviewers, likely to jeopardise the intended purpose. Looking forward to more.

Till next time, a hearty appreciation to the sponsors.

Joe Kimanthi MUTUNGI, PhD.

Current position: Post-Doctoral Fellow, WACCBIP, University of Ghana.

Dr. Mutungi is a Kenyan and holds a PhD in Medical Sciences in Infection Research, from Nagasaki University, Japan. After PhD, and prior to joining WACCBIP, he worked as a post-doctoral fellow at The University of Tokyo, Japan. After spending a total of ten years in Japan, he was highly motivated to return home, Africa, to join fellow African biomedical scientists in initiating and developing home-grown interventions for infectious diseases. Dr. Mutungi's is involved in basic laboratory research to dissect and understand the malaria parasite biology with the aim of discovering novel malaria vaccine and drug targets. Besides research, he is also involved in training and mentoring graduate students, grants applications to pursue new research projects as well as contribute to research capacity building.

Progress in fighting infectious diseases in Africa like HIV, TB and malaria is often stalling, for example, 2017 saw 3.5 million malaria case increase in the ten highest-burden African countries. This threatens the global ambition to achieve the UN SDG 3 (Good Health and Well-being). Protracted efforts and evidence-informed policies are critical in reversing this trend and in tackling emergences like Ebola. Dr. Mutungi is keen in establishing and participating in national, regional and global multi-disciplinary research collaborations and to develop into a world class independent scientist, leader, mentor, policy formulation and implementation capacities to innovate local solutions to Africa's health challenges.

Between May 20th to 24th 2019, as part of professional development, Dr. Mutungi attended the "*Advancing Innovative, Evidence-Informed, Demand-Driven And Policy-Relevant Research In Africa Through Capacity Building In Evidence Synthesis*" workshop at the University Of Ghana Centre For Evidence Synthesis (UGCES), which was attended by health professionals from 13 African countries. Participants were

trained by highly skilled professionals on the importance of evidence-based policy formulation in health research and implementation. Intensive and extensive training on the tools and methods of retrieving, organizing, analyzing, synthesizing and presenting research literature inn form of systematic reviews was offered. Participants were fully primed with the skills of formulating and drafting relevant Systematic Review Protocols of their choice, especially, in their fields of specialization. He is now keen to practically implement the skills obtained as well as develop into a professional in evidence synthesis and train others.

Theresa Netsai Chimponda



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University of Zimbabwe
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Biography:

Theresa Chimponda is a research assistant in the Infectious Diseases and Immunology Group (IDIG) which is based at the University of Zimbabwe. This is where she is studying for her PhD. Her interests are in microbiology, immunology and parasitology research.

She has carried out research in tuberculosis, cancer and currently schistosomiasis. Her major goal is to improve the health of the Zimbabwean community.

Alex Njeru

I hold a bachelor's degree in Development Studies from Maseno University, Kenya, and a master's in Public Policy and Management from Strathmore University, Kenya. I previously worked as a research and programmes officer at the Eastern Africa Policy Centre and dabbled up as adjunct faculty at the Jommo Kenyatta University of Agriculture and Technology (JKUAT).

I have been recently engaged as a Policy Engagement Officer at the KEMRI-Wellcome Trust Research Programme in Nairobi-Kenya. My main role is to interface my organization with governmental policy makers, as well as position my organization as a credible supplier of health policy advice in the country. This requires that I possess a precise understanding of health policy, and health issues in general terms.

Personally, I have interest in the political economy of health, and am particularly interested in the political economy of health. I have also been interested in the phenomena of transfer of knowledge stocks from research domains to, into the policy sphere. So much so that, I elected to write a Masters Thesis on the *"A critical analysis of the role of think tanks in Kenya's Economic Policy."*

The Evidence Synthesis Workshop will enable me to acquire the skills necessary to produce outputs that have influence and impact on policy makers, as well as institutionalize a culture of evidence use in policy making.



BIOSKETCH

NAME: Akili Kalinga **USER NAME** : Kalinga **DATE OF BIRTH:** 31ST January, 1971

PLACE OF BIRTH: Mbeya

CONTACTS: E-mail: kalingaaka@yahoo.com; Tele(Mob): 0755 380180

EDUCATION

Institution And Location	Degree	Year	field of study
KCM University College, Moshi	PhD	5th Year (2019)	Parasitological diagnostics
Muhimbili University of Health Dar	MPH	July, 2007	Public Health
University of Dar es Salaam, Dar	BSc	June, 1999	Zoology, Chemistry, Ed

A. POSITIONS AND HONORS

1. Positions and employment

2014 to 2018: Senior Research Scientist and Co-research team at Walter Reed Malaria Program (WRP-T), Dar es Salaam, Tanzania

2013 to date: Senior Research Scientist National Institute for Medical Research (NIMR

2004-2012: Research Scientist at National Institute for Medical Research (NIMR)

2000-2003: Research Assistant at National Institute for Medical Research (NIMR)

2. Leadership and other experiences

2016 to date: Member of Tanzania Onchocerciasis Elimination Expert Committee (TOEEAC)

2006-2012: Acting Director of Tukuyu Medical Research Centre of the NIMR

2009- 2015: Executive Secretary of Tanzania Public Health Association (TPHA)

2000- to date: Member of Tanzania Public Health Association(TPHA)

2008-2009: Temporary monitor for WHO/APOC: Monitoring Community Directed Treatment with Ivermectin (CDTI) Projects for control of Onchocerciasis in Africa.

B. MY CONTRIBUTION TO SCIENCE

1. Contribution to the epidemiology and control of Onchocerciasis and other NTDs in Tanzania

I have vast experience in the epidemiology and control of Onchocerciasis and other Neglected Tropical diseases (NTDs) especially Lymphatic Filariasis (LF) in Tanzania. Through the training I attended on Medical Entomology and vector (*Simulium damnosum* complex) control in the then Onchocerciasis Control Programme (OCP) in west Africa and experiences in entomological and epidemiological aspects of Onchocerciasis and through working closely with NTD Control Programme (NTDCP) in the country, I am more than ready to bring my experiences into the implementation of any Onchocerciasis research and/or intervention project geared towards its elimination as targeted globally. I have published twelve (12) papers in peer reviewed journals and over 20 technical reports on Onchocerciasis and other NTDs.

2. Contribution to research and control of Malaria in Tanzania

I have been involved in malariometric and entomological studies to estimate malaria transmission patterns in southern highlands of Tanzania. I was also involved in countrywide assessment of the community utilization and coverage of impregnated treated nets (ITNs). I participated in the assessment of clinical manifestations and outcomes in admitted paediatric patients. Of recent years, I have worked with Walter Reed Army Institute of Research (WRAIR) of US to conduct both passive and active epidemiological studies in Military health facilities in Tanzania. Under Walter Reed Malaria programme I participated in number of projects implemented to include prospective epidemiological malaria attack rate in military camps, evaluation of malaria rapid diagnostic tests (RDTs), Malaria surveillance and diagnostics quality improvement with Fionet technology, Assessment of performance of health workers and microscopy quality improvement. So far I have a total of eight (8) publications on malaria and three (3) publications on other (HIV/AIDS) health problems peer reviewed journals.

C. FUTURE RESEARCH INTERESTS

- Quality improvement in malaria diagnostics using standard and novel diagnostics
- Assessment of infections with parasite for Onchocerciasis elimination in endemic areas in Africa
- Systematic review for evidence-based, demand-driven and policy-relevant research for strengthening health systems and improving patient outcomes in Africa

DR. KABBALE FREDRICK GEORGE- BIODATA AS AT MAY 31ST, 2019

I am qualified with a Bachelor of Science Degree in Biochemistry/Zoology (Makerere, Kampala), a Master of Science Degree in the biology and Control of Disease Vectors (London School of Hygiene and Tropical Medicine), and a Doctorate of Philosophy Degree in Zoology (Makerere, Kampala). I am therefore equipped with the basic and advanced Biomedical Sciences, including Biochemical, Entomological and Parasitological knowledge, skills and techniques, in addition to health research, training/mentorship and supervisory skills.

I have published in peer-reviewed journals in the field of Entomology and Parasitology (For example: Parasites & Vectors, International Journal of Mosquito Research, African Journal of Biotechnology, African Journal of Animal and Biomedical Sciences).

In addition to coordinating the planning, implementation and evaluation of disease vector control programmes to enhance agricultural production and productivity in and around Buyende District, I also teach biochemistry, entomology, parasitology, pest/vector control techniques, field and laboratory techniques and other related courses at both undergraduate and post-graduate levels at Makerere University.

My career objectives are to train, mentor and build research capacity in the region; conduct research on and control insect pests/disease vectors for improved human and livestock health, increased agricultural production and productivity, improved food security and household incomes and subsequent well-being of the people.

The training in evidence synthesis equipped me with the foundations and tools on how to synthesize and evaluate evidence to formulate or change a policy. I acquired skills in preparing a systematic review, and use of systematic review evidence for decision or policy making. I formed collaboration links and networks with other scientists/experts and institutions for my future research career.

Therefore, following the training, I will disseminate the acquired knowledge and skills to other researchers in relevant institutions and a training multiplier effect will result, and thus research capacity in the region will be built, health systems strengthened for improved patient outcomes.

Further, the training in evidence synthesis will enable me and other subsequent beneficiaries conduct policy-relevant research that will inform sound decisions and policies for local and regional development.

PICOS-formulated review titles/questions

Facilitators are yet to go through to fine-tune

Akili kassinga Kalinga

TITLE: Complimenting mass drug administration (MDA) of Ivermectin with vector (Simulium) control through larviciding in fast flowing in rivers in endemic African countries

RESEARCH REVIEW QUESTION Akili kassinga Kalinga

Would complimenting mass drug administration (MDA) of Ivermectin with vector (Simulium) control through larvicide application in rivers be more effective at reducing parasite prevalence and intensity of transmission of Onchocerciasis compared to MDA of ivermectin alone in endemic communities where parasite infection is not yet eliminated despite over 20 decades of implementation MDA alone?

OBJECTIVE

To determine the effect of complimenting once per year MDA of Ivermectin with vector (Simulium) control through larvicide application in rivers for reducing prevalence and intensity of Onchocerciasis parasite infection in endemic areas where the parasite is not yet eliminated despite over 20 decades of implementation MDA alone

FORMULATING PICOS

PICOS refer to the following

P= Population; I=intervention; C=Comparator; O=outcomes; S=studies

Population

The following target populations will be considered

- Community members aged 5 years and above, being at risk and those diagnosed to have parasite infection and who are eligible for swallowing ivermectin as preventive chemotherapy, Those Interventions residing in districts that require complementing ongoing MDA of Ivermectin with vector control strategy

- Adult black flies to be captured in riverine areas of the fats flowing rivers near or within villages where eligible human population will be sampled
- Larvae of Simulium damnosum found on trailing vegetation, rocks, dead organic materials found on stretches fast flowing rivers

Alex Njeru

Title: A review of the effectiveness of integrated and exchange methods of policy engagement in promoting evidence informed decision making in health

Review objective

To evaluated the effectiveness of integrated and exchange methods of policy engagement in promoting evidence informed decision making.

Review question

Do integrated and exchange methods such as joint knowledge synthesis, researcher secondment and policy maker secondment improve evidence informed decision making in health

PICOS analysis

P: Ministries of (Health, Agriculture, science, technology and Environment mins and associated regulatory bodies in Lower and Middle-income countries)

I: Researchers embedded in Technical Working Groups in Ministries, Researchers seconded to Ministries to improve decision making capacity in ministries, policy makers seconded to research institutions, joint knowledge synthesis by researchers and policy makers.

C: Demand driven policy engagement, supply driven policy engagement

O: Evidence informed policy making

S: Qualitative review

Ntakarutimana Amans

Title: Investigating the most impactful health education model in reducing prevalence and intensity of soil transmitted infections among children under five

Review objective

Investigate the most impactful health education model in reducing prevalence and intensity of soil transmitted infections among children under five

Review question

What is the most impactful health education model in reducing prevalence and intensity of soil transmitted infections among children under five?

PICOS analysis

P: Children under five

I: Health and hygiene education

C: N/A

O: Prevalence and intensity of soil transmitted infections

S: Primary studies

DR. KABBALE

PICOS as used in formulating the title:

Types of participants-Population (P)	**Types of Interventions (I)**	**Comparator ©**	**Outcomes (O)**	**Study type (S)**
Children 0-5 Years, Pregnant Mothers and PLHAs	ITNs +Larviciding	ITNs alone	Reduced malaria incidence rates Reduced mosquito population density and Entomological Inoculation Rates	Randomized, Controlled Trials

PLHAs = People Living with HIV/AIDs; ITNs = Insecticide-Treated Bed Nets; Larvicides = Chemical and Bio-larvicides

Systematic Review Title: The impact of integrating insecticide-treated bed nets with larvicides on malaria transmission in Sub Saharan Africa: A systematic review and Meta-Analysis

Systematic Review Question: Does integrating insecticide-treated nets with larvicides have impact on malaria transmission in Sub Saharan Africa?

Dr Hlengiwe Sacolo Gwebu

Title: Operational challenges in implementing Mass Drug Administration within the preventive chemotherapy strategy for schistosomiasis in sub-Saharan Africa: systematic review and meta-analysis

Justification

Systematic documentation of the facilitators and barriers to implementation of MDA for schistosomiasis in sub-Saharan Africa is lacking. Understanding such factors is critical to strengthening future MDA schistosomiasis programs. This review therefore, aims at systematically documenting the barriers and facilitators to implementation of schistosomiasis in SSA.

Objective

To understand factors that influence the enable or hinder the implementation of MDA for schistosomiasis in SSA

To document facilitators and barriers to implementation of MDA for schistosomiasis in sub-Saharan Africa.

Research question

What factors that hinder the implementation of MDA for schistosomiasis in SSA?

PICOS

Population: People infected

Intervention: ??Comparators: ??

Outcome: ??

Studies: ??

Dr Peter Waiswa

Systematic review assignment

Title: Investigating the impact of live bait technology combined with trypanocidal treatment on the prevalence of T.b. gambiense parasites in domestic animals.

Review Objective: To investigate the impact of live bait technology combined with trypanocidal treatment on the prevalence of *T.b.gambiense* parasites in domestic animals

Review Question: What is the impact of live bait technology combined with trypanocidal treatment on the prevalence of *T.b.gambiense* parasites in domestic animals?

PICOS

Population: Domestic animals such as cattle, pigs, sheep and goats, dogs. *Glossina fuscipes*, the main agent of transmission of T.b. gambiense, is capable of feeding on any of these domestic animals besides humans. Consequently, these livestock can be infected with *T.b.gambiense* parasites and act as reservoirs of infection for human, the definitive host.

Intervention: Live bait technology entails using 'pour-ons or applying acaricides that contain deltamethrin, to kill tsetse flies that feed on such livestock. This in effect reduces the population of tsetse flies, thereby impacting on the transmission of T.b. gambiense parasites to domestic animals and humans.

Treatment of domestic animals with trypanocidal drugs rids such animals of all trypanosomes including T.b. gambiense and also prevents re-infection for up to three to six months depending on the type of drug administered. This intervention is meant to remove potential animal reservoirs and also reduce the transmission of the parasites.

Comparator: N/A

Outcomes: Primary outcome: Reduced prevalence of T.b. gambiense in domestic animals.

Secondary outcomes: Reduced population of tsetse flies, Reduced cases of gambiense-sleeping sickness in humans, Reduced cases of African Animal trypanosomiasis, Reduced prevalence of trypanosomes in livestock, Reduced ticks infestation and reduced prevalence of tick borne diseases, Improved livestock health and productivity.

Study: Primary research studies

Steve Manyozo

Systematic Review Exercise _ University of Ghana Centre for Evidence Synthesis and Policy (UGCES)

Review question

- What is the added benefit of integrated WASH interventions plus iron containing multiple micronutrient powders compared with micronutrient powders alone in reducing iron deficiency anaemia among children 4-23 months in low resource settings?

Revised

The added benefit of integrated WASH interventions plus iron containing multiple micronutrient powders compared with WASH alone in reducing iron deficiency anaemia among children 4-23 months in Sub-Saharan Africa: synthesis of the evidence from RCTs

P I C O S

Type of participants included

Studies that enrolled children aged 4 – 23 months, in low resource settings

Interventions

Iron containing Multiple MicroNutrient Powders (MNP) + any Water Sanitation and Hygiene (WASH) intervention

Comparison

Iron containing micronutrient powders (MNP)

Outcome

Incidence of iron deficiency, iron deficiency anaemia any time or duration dimension? Follow up time is key since outcomes of nutritional supplements take time to manifest

Secondary outcome

Incidence of diarrhoea

Adverse events

Type of studies

RCTs and quasi RCT

Theresah Chimponda

Title: The benefits of Praziquantel and micronutrients (Iron, Zinc) treatment in comparison to praziquantel in paediatrics (≤5 years old) living in an area endemic to *Schistosoma haematobium* infection.

P - Paediatrics (≤5 years old) living in an area endemic to *S. haematobium* infection.

I – Praziquantel and Micronutrients

C – Praziquantel

O – Lower prevalence

Dr Mwansa Ketty Lubeya.

EVIDENCE SYNTHESIS Protocol

What are the benefits and cost effectiveness of integrating HPV vaccine for prevention of cervical cancer and its precursors in the care of HIV care programs for adolescent girls'?

Title: Effectiveness and cost-effectiveness of integrating HPV vaccine for prevention of cervical cancer and its precursors for adolescent girls in HIV care programs in LMICs: A systematic review

P-Adolescent girls residing in LMICs

I-HPV Vaccine in HIV care

C-HPV vaccine stand alone

O-Cost, cost per case, ICER, reduction in mortality/morbidity

S-Observational studies, full economic evaluations, partial economic evaluations

OBJECTIVES

1. To estimate the effectiveness of integrating HPV vaccine for prevention of cervical cancer and its precursors for adolescent girls
2. To estimate the cost effectiveness of integrating HPV vaccine and HIV care program for adolescent girls in LMICs

Inclusion;

Studies in LMIC, Observational studies