



# REPORT OF THE FIRST NATIONAL INSTITUTE OF HEALTH RESEARCH CONFERENCE

*Laying the Foundations for Health  
Research in Somalia*

30<sup>th</sup> January - 1<sup>st</sup> February 2022

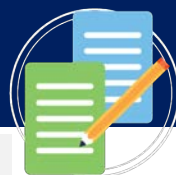


MINISTRY OF HEALTH  
& HUMAN SERVICES  
FEDERAL GOVERNMENT  
OF SOMALIA



NIH  
NATIONAL INSTITUTE  
OF HEALTH - SOMALIA

1<sup>st</sup> NIH HEALTH RESEARCH  
CONFERENCE



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# ACRONYMS AND ABBREVIATIONS

<b>AFENET</b>	African Field Epidemiology Network
<b>BOD</b>	Board of Directors
<b>CDC</b>	Centre for Disease Control and Prevention
<b>COC</b>	Conference Organizing Committee
<b>CS</b>	Caesarean Section
<b>CSC</b>	Conference Scientific Committee
<b>DG</b>	Director General
<b>Dr</b>	Doctor
<b>ED</b>	Executive Director
<b>EPHS</b>	Essential Package of Health Services
<b>FMOH&amp;HS</b>	Federal Ministry of Health and Human Services
<b>HIV</b>	Human Immunodeficiency Virus
<b>HMIS</b>	Health Management Information System
<b>HPSR</b>	Health Policy and Systems Research
<b>IDP(s)</b>	Internally Displaced Person(s)
<b>IDSR</b>	Integrated Disease Surveillance and Response
<b>KAP</b>	Knowledge Attitude and Practices
<b>MMR</b>	Maternal Mortality Ratio
<b>MOH</b>	Ministry of Health
<b>NCDs</b>	Non-Communicable Diseases
<b>NIH</b>	National Institute of Health
<b>PHAS</b>	Public Health Agency of Sweden
<b>PHU</b>	Primary Health Care Unit
<b>SDGs</b>	Sustainable Development Goals
<b>SHAJ</b>	Somali Health Action Journal
<b>SHDS</b>	Somali Health and Demographic Survey
<b>SIDA</b>	Swedish International Development Agency
<b>UHC</b>	Universal Health Coverage
<b>UNICEF</b>	United Nations' Children Fund
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WHO</b>	World Health Organization

# PREFACE

Dear Colleagues, Friends, and Respected Partners

I was very happy to witness how Somalia's National Institute of Health successfully organized the first health research conference jointly with the Federal Ministry of Health, and a large number of Somali universities, the Public Health Agency of Sweden, the Swedish International Development Cooperation Agency (Sida), the WHO Somalia Country Office, the Alliance for Health Policy and Systems Research (the Alliance), the African Field Epidemiology Network (AFENET), the U.S. Centers for Disease Control (CDC), the consortium of Somali Swedish Research Cooperation for Health, the Somali Swedish Researchers' Association and the Puntland State Ministry of Health, along with other several invaluable partners who extended their full support to the conference.

I was indeed humbled and honored to see this large gathering of Somali researchers coming from different academic institutions in the country (incorporating both the public and private health sector), along with several distinguished partners, some of whom have had a longstanding professional association with Somalia in research development and capacity building. I view this as a historical moment, whereby the evidence generated from the implemented health research can be translated to improve the equitable access to essential and quality health services across the country. The national health sector had set its strategic vision and mission for attaining the UHC through the development of an essential package of health services (EPHS), implemented across the health system nationwide. To embark on this goal successfully, we are encouraging health research to generate the knowledge necessary to accelerate progress towards UHC and the health-related Sustainable Development Goals (SDGs). We will collectively endeavor to foster a positive research culture in all our academic and service delivery institutions to advance their knowledge capacity towards the attainment of UHC and health SDGs and achieve the desired health targets and outcomes for all. We strongly encourage the convening of such research conferences to facilitate the exchange of knowledge between researchers, policymakers, and practitioners on research on topics that are relevant to the priorities of the national health system. This will facilitate the translation of research findings into policies and practical guidance that can effectively inform and enable the government to respond to the health needs of the vulnerable population groups. The importance of using research evidence in the formulation of health workforce policy development and implementation of HRH responsibilities will also increase government ownership, flexibility, and health workforce retention.

I extend my deepest sense of gratitude to the Puntland Ministry of Health for hosting this conference in Garowe; the international partners who extended their technical and financial support to the conference, the NIH and its Board of Directors, and their formulated scientific and organizational committees of the conference, the national and international academic institutions and to all the researchers who attended the conference and contributed their valuable time, ideas and energy on the various aspects of the conference.



**H.E Fawziya Abikar Nur**  
Minister for Health and Human Services  
Federal Government of Somalia

# ACKNOWLEDGEMENTS

Dear Colleagues, Partners, and Friends

We from the NIH take this opportunity along with the Federal Ministry of Health to thank all the participants of this national health research conference for their valuable potential contributions to the national health development process. We also take this opportunity to express our gratitude for the technical and/or financial support received from several international partners led by the Public Health Agency of Sweden; the WHO country office; the Alliance; the AFENET; and the Somali Swedish Research Cooperation for Health. We are confident that the conference proceedings will shape, in the short, medium, and long term, the national research agenda and stimulate our response to public health challenges including the COVID-19 pandemic. We will strive to pursue the evidence-based decision making in setting our strategic policies and operational plans and scale up our domestic resource mobilization. At this juncture, we must express a great sense of gratitude to the able NIH technical team who facilitated the conference's wider communication and organization, while building operational partnerships with all the national and international partners who expressed their interest in attending the conference by physical or virtual participation. The NIH Board of Directors assumed the conference Scientific Committee roles, joined by several other senior Somali scholars co-opted to the scientific committee, who reviewed and guided the submitted abstracts and selected the finally accepted abstracts and panel presentations for the conference. The few international and senior Somali diaspora researchers who were unable to travel due to the COVID-19 global risk, or positive tests due to infection, were able to participate digitally.

This conference has certainly given hope to the participants and the presenters to actively engage in health research development, with the dream to obtain future opportunities for training and scholarships as well as in the planning and implementation of health research, with guidance from research mentors, enabling them to prepare research manuscripts for publication.

**Abdifatah Ahmed**

NIH Executive Director,  
Federal Ministry of Health, and Human Services,  
Federal Government of Somalia



**Khalif Bile**

Chair NIH Board of Directors &  
Editor-in-Chief Somali Health Action Journal



## EXECUTIVE SUMMARY

The National Institute of Health (NIH) and the Federal Ministry of Health and Human Services convened their first Somali Health Research Conference in Garowe, the capital city of the Puntland State of Somalia, from the 30th of January 2022 to 1st February 2022, hosted by the Puntland State Ministry of Health. The conference aimed at convening health researchers, academics, and health care system practitioners to present their ongoing research projects and share their successes and challenges along with the gaps their studies have identified. The conference brought together a network of Somali health professionals, from federal and state level organizations, and from the international collaborating partners to identify the research needs and priorities to be considered for implementation. Moreover, the Health conference organized panel presentations and discussions on important health system areas leading to actionable recommendations as well as on the current and future concerns confronting the health sector across the country.

The conference also aimed at advancements in Health Research Settings, to effectively promote public health benefits, to establish national ethical guidelines and improve Somali Universities' health research performance. WHO, the Swedish International Development Cooperation Agency (SIDA), the Public Health Agency of Sweden (PHAS), The Alliance for health policy and systems research (AHPSR), the African Field Epidemiology Network (AFENET) and the Somali Swedish Research Cooperation for Health (SSRCH) provided the financial and/or the technical support necessary for the conference. More than 180 Somali researchers and service providers from the private and public health sectors attended the conference, while 50 abstracts and 12 panel presentations were deliberated upon during the three days of the conference.

Researchers presented stimulating discussions around a range of health topics rendering direct attention to all the six-health system building blocks capturing the core functions of the health system: service delivery; health workforce; information; medical products, vaccines, and technologies; financing; and leadership and governance. They also addressed the process elements of access, coverage, quality, and safety. Deliberations also focused on how to improve health, promote health equity, responsiveness, efficiency, and financial risk protection. To ensure the successful outcomes of the conference, its scientific and organization committees emphasized on the planning and management of its administrative and logistic requirements, and the scientific relevance and quality of the submitted presentations to the conference. A widely disseminated call for abstracts and effective resource mobilization by the key stakeholder partners were equally pursued.

The conference discussed various topics that were organized in sessions such as health systems; Somali health research production and dissemination; reproductive maternal newborn, child, and adolescent health; and communicable disease control by deliberating on the burden of infectious diseases such as malaria, HIV/AIDS, multi-drug resistant tuberculosis, and hepatitis viral infections in Somalia as well as the Covid-19 pandemic; non-communicable diseases; research training and capacity building and linking research to action. Linking the evidence generated by the academic universities with the service delivery system was also emphasized to scale up the progress towards achieving universal health coverage and health-related sustainable development goals (SDGs) in Somalia. The panel discussions focused on research capacity building, research partnerships, and on a bibliometric study reviewing 75 years of research practice in Somalia. The recently launched Somali Health Action Journal (SHAJ) was another landmark event welcomed by the audience for its capacity of research dissemination and sharing. At the end of the conference, the Federal Ministry of Health, NIH, and the partners attending the conference advocated for a sustained investment in health research and on the implementation of the Essential Package of Health Services promulgated by the country. Collectively, the conference participants and senior representatives of different partner organizations expressed their commitment to foster cooperation between the public and private sector in health system research, and to promote the development of innovative technologies and approaches. The conference concluded with comments from the main organizers who emphasized the link between health research and the health system practices and policies. This will undoubtedly optimize the public health benefits and drive the health services' delivery network towards greater access, equity, and all other expected outcomes and impact of UHC.

# 1 INTRODUCTION AND BACKGROUND

The Somali National Institute of Health (NIH), a semi-autonomous national public health institution arm of the Federal Ministry of Health and Human Services (FMOH&HS) called for abstracts to the first NIH Health Research Conference that was held in Garowe, Puntland, Somalia, under the overarching theme of health system research aimed at laying the foundation of Health Research in Somalia. The conference was conducted in partnership with the Public Health Agency of Sweden (PHAS), WHO, the Alliance for Health Policy and Systems Research, the African Field Epidemiology Network (AFENET) and the Somali-Swedish research cooperation for health consortium, and a sizable number of Somali universities and other health stakeholder partners. In addition to its major research focus, NIH contributes to strengthening the country's International Health Regulations (IHR) and their effective implementation in collaboration with WHO. NIH is currently leading the National Health Research Agenda by supporting research capacity building with active networking and collaborative efforts with the universities both at federal and state level. NIH also plays a major role in scaling up the training on Integrated Disease Surveillance and Response (IDSR) to improve public health surveillance and response for priority diseases and conditions at the service delivery level, the community and at national level. It also plays a technical supportive role in the prevention, control, and research of the COVID-19 pandemic, closely liaising with the national public health laboratory. NIH is represented on the Editorial Board of the only peer reviewed Somali Health Action Journal (SHAJ), which constitutes an important platform where health researchers and health system professionals can publish their research articles for free.

## 2 AIMS AND OBJECTIVES OF THE CONFERENCE

### 2.1 Aims of the Conference

Laying the foundation of Health Research in Somalia by strengthening the health research capacity, sharing the available evidence for action and promotion of research collaborative networks.

### 2.2 Conference Objectives

- a. To convene the health research stakeholders to share reports on their ongoing research projects and identify the health challenges, gaps, and solutions for knowledge translation practices
- b. To develop a network of Somali health scholars, regional organizations, and international collaborating partners.
- c. To identify the research needs and priorities and the required research capacity development and set guidelines for their effective promotion and implementation
- d. To organize panel presentations and discussions on important health system research topics leading to actionable recommendations on current and future concerns facing the health sector across the country.



# 3 CONFERENCE PLANNING, PREPARATION, ORGANIZATION AND BUDGETARY SUPPORT

The NIH Board of Directors and NIH management initiated in 2021 the proposal to convene a health research conference in Somalia through a consultative process with the Federal Ministry of Health; the PHAS; the WHO Country Office and the Somali and Swedish Research Cooperation for Health. After several rounds of consultations, the mission of the conference was approved by NIH Board of Directors (BOD) and by HE the Federal Minister for Health and Social Care, and by all the consulted stakeholders and partners. Soon after, the NIH in close coordination with the FMOH and its partners started the conference planning process by establishing both conference organizational and scientific Committees. An estimated conference budget was first prepared by NIH and approved by the NIH Executive Director and subsequently by its Board. The budget proposal was shared with WHO and the PHAS, who after a close review process accepted to finance the conference. In operational terms, the NIH and its board of directors (BOD) led the conference organization in close coordination with the FMOH, the Puntland Ministry of Health and partner organizations. The keenness demonstrated by the Somali Universities to participate in the conference was overwhelming. The conference invited some key international Somali scholars and collaborating international research partners to the conference to widen the scope of knowledge sharing and enhance the NIH research capacity building process. Health related sectors were also invited to submit abstracts of studies on social determinants of health in the Somali setting.

## Call for Abstracts

The conference program was closely coordinated and led by the NIH on behalf of the FMOH&HS and other conference partners. Invitation letters were sent to all the Somali universities and health professionals both from the public and private sectors and to the partner organizations operating in the country, encouraging them to share their research work. The conference thus offered a unique opportunity for experience sharing and to learn from the valuable lessons generated and to identify innovative solutions to be translated into practice within the Somali healthcare delivery system. In addition to the specific health sector, abstracts from other social sectors that address the social determinants of health and their major implications on health, were also welcomed. The following guidelines were set for the abstracts to be submitted:

- i. They must be original, not published previously in any scientific journal, while an additional Somali translation would also be welcome with a word range not exceeding 500 words.
- ii. The presented abstracts should be based on ongoing or completed studies for which the results are readily available and follow a structured track, organized into a background of the study while enunciating the aims, objectives, study methods, results, and conclusions.
- iii. The abstracts were to be submitted by email with the authors' names, institutional affiliations, and positions.
- iv. Previously presented abstracts were not to be accepted for submission to the conference. However, abstracts presented at a local or regional event but not published could be presented again at a national meeting.
- v. The title of the abstract must have reflected the context and aims of the study and the scope of the investigation and the goal, without use of jargon or unfamiliar acronyms.

- vi. The list of authors was restricted to those individuals who actually did the study, conceived it, designed it, gathered the data, wrote the abstract or drafted the manuscript. The abstract submitting author was the lead presenter of the abstract.
- vii. The abstract submission was closed on the 5th January 2022, enabling a 2-week review.

The conference scientific committee (CSC) examined the abstracts and established virtual contacts with the authors submitting the abstracts, informing them that the final decision would be reached and communicated to them by the 20<sup>th</sup> of January 2022. Meanwhile, the CSC encouraged the authors of the presented abstracts to try and publish their completed research manuscripts in the Somali Health Action Journal (SHAJ), the only Open Access Somali peer-reviewed research dissemination forum. The authors would be offered support in the form of mentorship and their publication free of charge after approval in the journal's external peer review process.

### **3.1 Engaging Universities and the Federal Member States Ministries of Health**

The consolidated decision to hold the conference was followed by framing a range of consultations and discussion meetings with Somali universities and encouraging their active participation in the research conference. Thirty-two (32) universities were identified, contacted, and involved in the process. The NIH Public Health Specialist, the Executive Director and NIH Board made direct contacts with all public and private local universities engaging them to attend zoom and physical meetings to publicize the objectives, goals, and the operational plans of the upcoming conference. Extraordinary online meetings were organized for all universities where the conference agenda was presented to elicit their interest and participation. The result of the engagement and networking yielded an encouraging and overwhelming show of interest by all the contacted universities. The state level ministries of health, and public and private health sector operating professionals were also informed about the event and invited to participate.

### **3.2 Conference Technical and Operational Committees**

In this first national health research conference, the NIH was fully aware of the tremendous amount of organization and planning time required and the efforts necessary for successfully achieving its set objectives. The conference technical coordination and planning was assumed by the members of the NIH BOD that include the NIH Executive Director who in turn provided oversight to the implementation of the decisions made by the BOD. At this juncture, the Conference Organizing Committee (COC) consisting of the NIH technical officers was established. It was led by the NIH senior research officer and had the task to coordinate all the conference organization processes. The Executive Director and the COC members set their operational plans liaising with all the potential stakeholders of the conference and sponsors sharing the day-to-day progress with the FMOH&HS for support and advice. The news about the upcoming conference was widely disseminated through announcements over the wide range of Somali media by numerous press events, while repeatedly conferring with the universities at both federal and state level, encouraging their technical participation by submitting abstracts and scaling up the awareness necessary among health professionals across the country.

The COC assigned some of its members led by the senior research officer to collect and register all the submitted abstracts and liaise with the CSC for their review and approval. The COC was also given the task of reaching out to the Puntland MOH being the conference hosting institution in jointly planning the different activities of the conference. The team identified and assessed the conference venue, accommodation and conference facilities, the availability of the right IT, audio and video equipment, projection screens, sufficient charging spots for participants and around the clock Wi-Fi access. Utmost efforts were made to make these facilities available and successfully conclude the administrative, budgetary, logistic and media and communication aspects of the conference.

The technical support to the conference was led by the NIH BOD, that was also responsible for the process of reviewing the abstracts. The submitted abstracts were required to be well-structured with distinct, labelled sections indicating the aims and objectives of the study, methods, results and conclusions. Abstracts were also required to be consistent with the specific subject under study and illustrate a design and data set that strongly relates to the conclusions being made. Abstracts were also required to not exceed the indicated word count. To facilitate this process the CSC established close communication with the authors of all submitted abstracts to help them improve the completeness and quality of their submissions. This process required an extensive level of mentorship to most of the presenting authors to maximize chances to successfully organize their abstracts for effective presentation. The CSC consisted of the Board members and several other distinguished Somali scholars who volunteered their time with the BOD for this important undertaking. The submitted abstracts were divided among the members of the CSC for review. They were advised to communicate and mentor the authors to bridge any gaps identified in the submitted abstracts. The abstracts' review process approved 51 abstracts out of the 91 submitted abstracts to the conference.

### **3.3 Conference Program and Participants**

The NIH constituted conference management committees i.e., the COC and CSC who took up their respective roles and set a detailed outline of the conference programme, listing the research abstracts that were accepted for presentation. A detailed agenda was then set for the conference starting with the registration and planning of the different stages of the conference proceedings. The submitted accepted abstracts and panel presentations were organized into themes to be delivered in their assigned sessions, where each presentation was followed by a short questions and answers session. The list of the themes is outlined below:

- i. Health system strengthening
- ii. Somali health research generation and dissemination
- iii. Reproductive maternal new-born, child, and adolescent health
- iv. Communicable diseases control,
- v. Prevention and control of non-communicable diseases,
- vi. Research training and capacity building towards linking research to action.

The conference was attended by many committed Somali scholars, young faculty, and health professionals both from the public and private health sector. A total of 183 participants and delegates attended the conference including both national and international researchers and academics from the Somali universities.

Other dignitaries who participated in the conference included H.E. Dr Fawziya Abikar Nur, Federal Minister of Health and Human Services; H.E. Dr Jama Farah Hassan, Minister of Health, Puntland; H. E. Per Lindgårde, Ambassador of Sweden to Somalia; and Mrs. Petra Smitmanis-Dry from the Swedish International Development Cooperation Agency (SIDA); Dr Mamunur Rahman Malik, WHO Representative and Head of Mission to Somalia with his team; ) and representatives from the African Field Epidemiology Network (AFENET), Save the Children UK, representatives of the Editorial Team and Editorial Board of the Somali Health Action Journal (SHAJ), and senior researchers, Professor Max Petzold from Gothenburg University and Associate Professor Klas-Göran Sahlén from Umea university of Sweden. It is equally worth indicating that a tangible number of Somali and international senior researchers and research associations also joined the conference virtually through zoom, including the Public Health Agency of Sweden (PHAS), several of whom delivered their presentations at the conference followed by discussion.

# 4 CONFERENCE PROCEEDINGS

## 4.1 Opening Session

The 30<sup>th</sup> of January 2022 conference proceedings' opening session was introduced by Dr. Abdirizak Hersi Hassan, Director General for Health, Puntland State of Somalia. He welcomed the convening of this groundbreaking conference, co-hosted by the national institute of health (NIH), the Federal Ministry of Health (FMOH) and the Puntland State Ministry of Health. This conference was supported by a number of national and international partners.

Dr Abdifatah Diriye Ahmed, Director of NIH, then delivered a speech indicating how the conference will provide a platform for the young Somali researchers, their academic institution and the health system in general to share biomedical and public health research that promotes health equity and improves the health status of the population.

The next speaker was Marina Madeo, the WHO Policy Advisor who inaugurated the conference, illustrating how the health sector is on a journey of transformation and expressing her hope for a health research agenda focusing on diseases of poverty and strengthening health research capacity. She hoped that the conference will contribute to the comprehensive implementation of the Somalia Essential Package of Health Services (EPHS 2020) across all levels of care from community to specialized hospitals, and to the progress towards UHC attainment. The senior WHO officer also praised the establishment of the peer-reviewed Somali Health Action Journal (SHAJ), which offers a platform to increase the effectiveness of research dissemination.

This was followed by the statement of Ms. Malin Ahrne, the Representative of the Public Health Agency of Sweden, drawing attention to the notion that health research be the foundation for informed decision making; strengthening the health systems, improving efficacy, service delivery, and quality whilst introducing evidence on how to prevent disease and improve health. She emphasized that the conference should be an event that needs to be held regularly, as it will render NIH to become a leading hub for health research in the country and a valuable bridge to start collaboration with the global public health community. Health research is not new in Somalia, but this is truly a new beginning and opportunity, Ms. Ahrne concluded.

Dr Herbert Kazoora, the acting Head of Programmes of the African Field Epidemiology Network (AFENET), and the AFENET Director Dr Simon spoke next. They initiated their collaboration in 2019 with NIH and FMOH on capacity building in disease surveillance and response to emergencies through the training of front-line health workers in a field epidemiology course. The AFENET senior executives expressed their happiness to be part of this historic Health Research Conference. They also indicated that the operational research undertaken by the trainees of the Field Epidemiology Training Program (FETP) will greatly contribute to health research capacity building in the country. They equally welcomed the Somali Health Action Journal and hoped it would be added to the AFENET list of peer reviewed Journals soon and shared with the FETP fraternity in Africa and Beyond.

The following speaker was H.E Mr. Jama Farah Hassan, the Puntland Minister of Health, who warmly welcomed all the participants and executives attending this historic research meeting. He touched on the significance of health research in Somalia being vital for the development of the healthcare system by generating knowledge and new evidence to inform policies. The minister stated that by the end of the conference, we will all be in a better position to know where we will go from here, whilst identifying

how we should develop and improve the capacity and quality of our research. Finally, he thanked everyone who had participated in the conference and contributed to its final success.

The keynote speaker, the Federal Minister of Health of Somalia H.E. Fawziya Abikar Nur welcomed the conference participants with special note of gratitude to the representatives from WHO Somalia, the PHAS, the Alliance of Health Policy and Systems Research, the AFENET, CDC and to all the other invaluable partners who extended their full support to the conference. “I was humbled and honored” said the Minister “to inaugurate this historic public health research conference in Garowe, led by the National Institute of Health Somalia and graciously hosted by the Puntland Ministry of Health.” The Minister emphasized that the evidence that research produces is critical for improving the equitable access to essential health services across the country through the nationwide implementation of the promulgated EPHS.

The Minister reiterated that the conference platform will provide an opportunity to the participating universities, researchers and health system professionals and care providers to showcase their research studies and scale up their collaboration and linkages and promote knowledge dissemination. The latter will help generate the solutions necessary to address the challenges faced by the health care systems through its current fast progressing recovery process following decades of conflict and disruption.

The national health sector had set its strategic vision and mission for attaining the UHC through the development of an essential package of health services (EPHS), implemented across the health system nationwide. To embark on this goal successfully they had decided to adopt the implementation of health research to generate the knowledge necessary to accelerate progress towards UHC and the health-related Sustainable Development Goals (SDGs). “Let us collectively foster a positive research culture in all our academic and service delivery institutions and aim at advancing our research capacity and making progress towards UHC and health SDGs with the effectiveness needed to achieve the desired health targets and outcomes for all,” she asserted.

In conclusion, she thanked the NIH and its Board of Directors for their exceptional efforts and contribution to this important conference and appealed to all the delegates to engage in the dissemination, implementation and translation of the research conference outputs for policy and action. On this note, she officially opened the first NIH national health research conference and sent her good wishes for its successful deliberations.

## 4.2 Panel and Keynote Presentations – Summaries

During the different sessions of the conference the following panel presentations were delivered:

### **i. Health System Research Priorities and the Essential Package of Health Services towards Universal Health Coverage (UHC) are mutually reinforcing interventions**

*Dr Mohamed Abdi Jama, Senior Policy Advisor to the FMOH and Member NIH Board of Directors*

Health policy and systems research (HPSR) is a field of science that seeks to understand and improve how societies organize themselves in achieving collective health goals, and how different actors interact during the policy and implementation processes. This field contributes to policy outcomes and is trans-disciplinary in that it draws from health economics, political science, sociology, anthropology, management, and other sciences and uses a question-driven approach, which has an applied focus (seeks to solve problems and address real-world contextualized issues and challenges). There are four spectrums of research for health and they include Biomedical

research (Research and development for medicines, vaccines, diagnostics, appliances), Health Policy and Systems Research (Research on health systems management, functions, efficiency, effectiveness, system factors affecting access, scale-up, monitoring and evaluation) and Social Sciences & Behavioral research (Research on social and behavioral factors influencing health and their relation to equity, access, lifestyle and health-seeking behaviors). The problems encountered in health include (i) insufficient use of existing knowledge for enhancing health system performance, (ii) lack of information on the performance of health systems and on how policies affect health care, (iii) even when knowledge is available, it is not necessarily known to, or used by, policy makers or practitioners, and (iv) low capacity to produce and disseminate research to facilitate the end users. The goal of any research priority setting exercise is to identify neglected areas and invest in research that will result in improved health outcomes for the populations in greatest needs. A country has to set research priorities including tools and approaches. It is worth noting that there is no single tool which can respond fully to the needs of a country. Somalia like any other country has its unique and specific context. It is the country's decision to pick one specific approach or use a mix of different tools/approaches, a process which should be transparent, participatory, and inclusive.

The number of public health facilities in Somalia is 1074, out of which 75.5 % are functional, while the remaining 24.5% are operationally disrupted. On average, there are 0.76 facilities /10,000 populations. In the private sector there are 3,289 health facilities, the majority situated in 3 zones (Somaliland, Puntland, and Benadir Regional Administration (BRA) and 79% of these are located in urban and 20% in rural areas. Density of private health sector facilities is 2.2 facilities per 10,000 populations (including pharmacies) and 0.93 per 10,000 (excluding pharmacies). Regarding the health indicators, Maternal Mortality ratio (per 100,000 live births) is 692, under five mortality Rate (per 1,000 live births) is 137, Neonatal Mortality Rate (per 1,000 live births) is 40, Infant Mortality Rate (per 1,000 live births) is 85. Burden of disease is dominated by communicable diseases (48%), nutritional (6%), non-communicable (23%) and maternal, neonatal and childhood issues (15%).

## ii. The Human Resource for Health Landscape in Somalia

*Dr Mohamed Hussein Alasow, Director of Human Resources, Federal Ministry of Health, and Human Services (FMOH/HS)*

The Somali national health system has suffered from decades of health system disruption, conflicts, extensive population displacements, major security challenges, drought, and flooding. Somalia's Human Resource for Health (HRH) density index is less than 1 skilled health worker per 1,000 populations compared with 2.3 as per WHO recommendation for the provision of basic health services. There is an inequitable distribution of physicians, pharmacists, nurses, and midwives), with relatively high concentration in larger cities and a lower concentration in the country's rural and remote population areas. A human resource assessment was conducted, led by the HRH leadership and team members at the Federal and State level public health sector. The assessment used a maturity model which was developed by the African Health Profession Regulatory Collaborative (ARC) and modified in the Somalia context and was used to assess the Federal and State Ministries of Health (MOH) on internationally recognized regulatory functions such as HRH legislation, accreditation of pre-Service education and registration and licensure of professionals. The result of the assessment revealed that all the Federal and State Level Authorities are at stage 1, demonstrating an ad-hoc regulatory system, with minimally documented regulations. Secondly, budgetary constraints in scaling up government leadership were noted. Almost 60% of the country's current health workforce comprises of physicians, nurses, and midwives. The country still suffers from an extreme workforce shortage for all health categories. To bridge the health workforce gap, the researchers will need to focus on a range of issues such as health workforce planning, identifying their training needs, impact of contracted out services on coordination and

retention, and workforce governance dimensions such as working conditions, training, supervision, task shifting and the expansion of the community health workers (CHWs) as one of the PHC cornerstones and an entry point for community based operational research.

### iii. Integrated Disease Surveillance and Response (IDSR) - the way forward

*Abdifitah Diriye Ahmed, Director of NIH, Federal Ministry of Health, and Human Services (FMOH & HS)*

Following recent assessments, the 2016 Joint External Evaluation of human resource core capacities indicated significant gaps in Somalia's disease surveillance system including lack of comprehensive surveillance guidelines, duplication of surveillance functions and limited resources to support surveillance. To comprehensively address these gaps, the NIH and FMOH in collaboration with WHO, US-CDC, UNICEF and other partners adopted the integrated disease surveillance and response strategy as the overall framework for improving the performance of Somalia's disease surveillance system. The objective summarizes evidence in support of IDSR, identify factors for its successful implementation and describe progress attained by the national health system. The methods and findings are part of the NIH and FMOH led program for strengthening disease surveillance in Somalia. Evidence in support of IDSR strategy implementation and ingredients for its successful implementation is synthesized from review of published literature on IDSR performance. Progress towards IDSR implementation is determined by comparing the planned versus executed roadmap activities.

Evidence in support of IDSR strategy implementation relates to; 1) improved timeliness and completeness of surveillance data, 2) improved detection of outbreaks, 3) improved use of surveillance data in monitoring of disease trends at facility-level, 4) improved cost effectiveness of conducting disease surveillance, 5) improved consolidation and sharing of surveillance data across relevant sectors, 6) improved collaboration across relevant sectors and 7) acceleration of International Health Regulation core capacity achievement through reduced duplication, overlaps and wastage.

Evidence on ingredients for successful IDSR strategy implementation relates to; 1) establishment of a functional IDSR coordination unit at the highest possible level, 2) gaining early stakeholder consensus on priorities of IDSR implementation, 3) ensuring good system design, 4) adapting the IDSR strategy to the local context, 5) integrating the strong components of previous vertical systems, 6) developing a human resource (HR) and a domestic financing strategy for IDSR, 7) integrating CBS and EBS with the IDSR, 8) conducting high-level advocacy for IDSR implementation, 9) optimizing IDSR leadership and accountability and 10) integrating IDSR within the broader national health information system (HIS).

The achievements attained thus far include the following: 1) a roadmap for IDSR implementation was developed, 2) a functional IDSR TWG was established, 3) a costed 3-year operational plan for IDSR implementation was developed, 4) comprehensive guidelines for IDSR implementation were developed, 5) *DHIS2* is being adapted to support IDSR and 6) IDSR sensitization/advocacy is ongoing. Next steps will include 1) endorsement of the IDSR operational plan, 2) validation of IDSR guidelines, 3) development of the HIS and the HR strategy to support IDSR, 4) development of IDSR training materials, 5) rolling out IDSR and 6) IDSR implementation monitoring.

Finally, there is sufficient evidence in the national health system supporting IDSR implementation, while the challenges in implementation will be addressed in a timely fashion by the FMOH and NIH in collaboration with WHO and other partner organizations.

#### iv. Field Epidemiology Training Program

The field Epidemiology Training Program is a competency-based, mentored workforce development training program to improve epidemiology skills and epidemiologic capacity of MOH staff “Learning by doing and focus on practical skills — surveillance, field investigation, design / analysis of Epi studies, and communication”.

There are three levels of FETP offered: The Frontline Program, which is the three-month program we’re focusing on here; Intermediate, which is a more extensive 9–12-month program involving more in-depth analysis and data use, and the classic two-year Advanced Program, modeled on the two-year EIS program at the US CDC. For countries with all three programs, we expect the greatest number of persons to be trained in the frontline, fewer to be trained in Intermediate, and even less trained in Advanced programs. Advancement among countries with all three, depends on selection of the best from each level and their planned career path.

However, we expect mentors to come not only from existing in-country epidemiologic staff, but also from persons who advance through the program. That is, graduates from the Advanced FETP should be mentoring those in the Intermediate stage, while Intermediate graduates can mentor persons in Frontline. We call this ‘mentorship in cascade’. The table below summarizes some of the features of the 3 tiers of FETP.

	Frontline	Intermediate	Advanced
<b>Target audience (MOH Level)</b>	District, middle, national	Middle, national	National
<b>Duration</b>	3 months	9 months	2 years
<b>Cohort size</b>	20–30	15–20	8–15
<b>Part-time or full-time</b>	Part-time	Part-time	Full-time
<b>Awarded on completion</b>	Certificate	Certificate	Certificate, MPH, or other Master’s
<b>Classroom</b>	2 weeks+	8 weeks	21–26 weeks
<b>Field Component</b>	10–12 weeks	33 weeks	78–83 weeks

#### Competency Differences by FETP Tier

The table below demonstrates that all 3 tiers cover the same competency domains, but at different levels of proficiency.

	Frontline	Intermediate	Advanced
<b>Public health surveillance</b>	Simple analysis of survey data using tables, graphs, maps	Produce surveillance report; evaluate surv. system	Operate, improve, and design surv. system
<b>Field investigation</b>	Conduct case investigation, assist outbreak investigation	Conduct outbreak investigation using descriptive epidemiology	Conduct outbreak investigation using analytic epidemiology
<b>Scientific communication (written)</b>	Produce simple internal summary of surveillance data	Write abstract, surveillance report, field investigation report	Write manuscript for peer-reviewed journal



AFENET has seven operational regions, carved out based on epidemiology, population, language, country-accessibility and magnitude of global public health resources. They include: Anglophone West Africa with hub in Ghana, Central Africa and Indian Ocean with hub in DRC, East Africa with hub in Tanzania, Horn of Africa with hub in Ethiopia, Nigeria with hub in Abuja, Southern and Lusophone Africa with hub in Zimbabwe and Franco-phone West Africa with hub in Burkina Faso. Our total reach is at least 32 African countries. FETP workforce by tier in AFENET region includes 16 Advanced (2 years – degree with a total of 2404 graduates, 14 intermediate (9 months) with 385 graduates and 30 Frontline (3 months) with 7122 graduates.

AFENET CORP of disease detectives was established in 2018 as a civil voluntary professional service of culturally competent field epidemiologists built on the One Health approach, membership-Graduates and Residents of FE (L) TPs in Africa comprising of Advanced FETP, Intermediate FETP and Frontline FETP.

The Suggested FETP Requirements for Somalia are based on a total Population of 15.9 million people, reflecting the need for one field epidemiologist per 200,000 population which means minimum requirements of at least 80 Advanced or Intermediate FETP graduates. Somalia Frontline FETP Road Map since 2018 to date included the following: the AFENET Engagement with MOH leadership on Establishment of FETP; Joint AFENET/IGAD/CDC engagement with MoH leadership (AFENET will subsequently be hiring two embedded Epidemiologists and Administrator); and the selection of the first cohort of 26 participants - Aug 2021. The first cohort mentors training was initiated on 1<sup>st</sup> Cohort on 29 August 2021, where 21 Officers graduated on Jan 25, 2022. A stakeholders' workshop was conducted on 14 Feb 22, and the participants for the 2<sup>nd</sup> Cohort were selected on February 15-17, 2022, and started training on February 20-25,2022

#### **v. Launching the Somali Health Action Journal (SHAJ): Dreams Come True**

*Khalif Bile Editor-in-Chief and Klas-Göran Sahlen Managing Editor*

##### **The Purpose**

The Somali Health Action Journal (SHAJ), launched in November 2021, is an open-access online publication to which every health stakeholder including university students can access its wide range of health information at no cost. It creates a platform where university academics, health system professionals, policy makers and international partners can develop and publish local evidence-based solutions for the health problems of the population.

The Journal is the right technical platform for building collaborative health research partnerships and promoting research capacity building across the health system. The idea of launching the Journal evolved from several consultation seminars organized through the Somali Swedish research collaboration with expressed support by the Federal Ministry of Health, WHO and the Somali universities. It aims to focus on rebuilding the Somali health care system, recognizing the crucial role of universities in building research capacity in the country. Another important reason for launching the Journal is to encourage local research at national level and promote its dissemination and the translation of the generated evidence into policy and action to drive the health system towards the attainment of Universal Health Coverage (UHC) and other health related Sustainable Development Goals (SDGs) by 2030.

##### **The SHAJ Public Health Role**

The Journal will act as a health research forum predominantly focusing on health research addressing priority issues in the Somali context that include communicable diseases; reproductive,

maternal, neonatal, child health, nutrition, and adolescent health; the non-communicable diseases; injuries and the other pillars of the health system. SHAJ will give special attention to community-based research, as a vital strategy for developing effective and culturally relevant and essential health interventions. The SHAJ will also encourage multisectoral health research, addressing the underlying environmental and social determinants of ill health. SHAJ will also promote the attainment of UHC through the wider and equitable dissemination and implementation of the Essential Package of Health Services in the framework of primary health care. Another core mission of the Journal is to communicate and disseminate updated evidence to influence health care decisions, policy, and practice. The Journal will serve as a bridge for peace and a voice for reconciliation and trust-building across the health care system.

### **Articles to be Accepted**

SHAJ will accept original articles aligned with the SDGs and UHC priority interventions; short communications that include pilot studies, field-oriented surveys, and qualitative interviews; capacity building papers documenting how essential research infrastructure and capability can be developed; networking experiences reflecting on how partnerships are beneficial in a post-conflict country; educational articles that outline the design, implementation, and evaluation of initiatives to improve the competence and performance levels of the health workforce and the services they provide; review articles on health promotion, disease prevention, diagnosis and care; debate articles sharing critical reflections about public health issues; guideline articles of relevance for public health and evidence-based health care, and perspectives in public health articles presenting practice-based knowledge and opinion articles based on case studies and public health relevant news.

### **Promoting Research Collaboration**

To promote collaboration, researchers and other health stakeholders will need to develop the practice of working in partnerships. To effectively respond to the existing networks of research collaboration opportunities, the collaboration offered by Sweden and other international stakeholders need to be coordinated and put into action. In this regard, the public health research functions of the Somali National Institute of Health, the collaborating Sweden Public Health Agency, the Swedish universities, WHO, the Somali universities and the research supportive national and international stakeholders are expected to improve health systems' performance and research capacity across the country.

The platform created by SHAJ is expected to generate solutions to the prevailing health problems and pursue strategies that are relevant in the local context. SHAJ will encourage the young Somali professionals through its team of international advisors, the Journal editorial team, and editorial board and through its innovative mentorship strategies. In its capacity building efforts in undertaking research and its publication and dissemination, gender mainstreaming in research and health system recovery and resilience will constitute the key priorities of the Journal.

#### **vi. Building capacity for Somali health research training of trainers in a blended learning model; Implications for university collaboration and the way forward**

*Klasse-Göran Sahlen, Deputy head of department, Associate professor Department of Epidemiology and Global Health, Umeå University*

The Somali-Swedish Research Cooperation for Health (SSRCH) initiative builds on a collaboration between six Somali universities (East Africa University, University of Hargeisa, Galkayo University, Benadir University, Puntland University of Science and Technology, Amoud

University), five Swedish universities (Umeå, Lund, Uppsala, Karolinska Institutet and Dalarna) and the Somali-Swedish Researchers' Association (SSRA, a small Swedish NGO). Presently the Somali National University and the Somali National Institute of Health have joined hands and strengthened the collaboration. The initiative aims at developing a health action-oriented programme for country-based research and at strengthening research capacity of relevance to Somali development as well as to promote Swedish development cooperation with Somalia and other fragile states. The participation of SSRA has helped establish a valuable link to the Somali diaspora, with contextual knowledge and academic competence.

Several experts from all parts of Somalia stressed on the need for and importance of our collaboration:

- Prof Dalmar outlined the need for academic training.
- Dr Maryan Qasim outlined the poor health situation.
- Dr Deria Ereg stressed that the civil war has seriously affected the health sector.
- Dr Abshir Abdi mentioned national standardized curricula and lack of skilled faculty.
- Prof Abdirashid Omar Ibrahim added the need for better research capacity with special attention given to research ethics.
- Prof Shirwa asked for more national and international collaborative partnerships in research.
- Prof Mohamed Hussain Aden mentioned the absence of support from international partners.

The short-term aim of our present initiative is to consolidate the ongoing cooperation, offer basic research training to an extended group of Somali university staff members. The outcomes of the first completed training course were thoroughly evaluated and jointly labelled as successful and feasible to be executed within a fragile country context. An agreement was reached on organizing a second research training course enabling young Somali faculty staff to build research and teaching capacity and give opportunities for postgraduate research training.

Course participants will be selected from participating universities (including Somali National University as a new member), federal and regional health institutions, and staff from the Somali National Institute of Health. We expect a total of 30 participants. The course will last for two years including the recruitment period. It will be conducted by teachers from Swedish universities in close collaboration with co-teachers from Somali universities and with input also from the National Health Institutes. A digital platform will be used for web-based training material and virtual classroom events for supervision. The course work will include two weeks of face-to-face theoretical training, some supervised research activities, a midterm and a final theses defense session.

The details and particulars surrounding the execution are presently being worked on within the SomSwe network, holding senior and junior researchers from East Africa University, Benadir University, and Umeå University. The theoretical sessions will focus on understanding and applying both quantitative and qualitative methodologies. Ethical considerations and academic writing will be discussed. These sessions will form the basis for the development of projects (study protocols) that should focus on an identified health issue of relevance for the Somali context and be tested in practice. The participants will be provided with Swedish and/or Somali supervisors, receive on-line supervision for the research work and in the writing of a thesis that is to be orally presented and discussed in the final examination.

**vii. Development of National Ethical Guidelines for Health Research: providing the ethical framework within which the ethical review process will operate across the health system**

*Mayeh Omar, Associate Professor: University of Leeds, UK*

Health research that involves human subjects requires compliance with ethical principles and guidelines. National Ethical Guidelines for Health Research in Somalia could play an important role in maintaining the high ethical and scientific standards for conducting health research. This keynote presentation emphasized on the importance of National Ethical Guidelines for Health Research whose compliance could ensure the autonomy, dignity, and well-being of research subjects, as well as the integrity and credibility of research results.

Ethical Review Boards (ERB) are proposed to be established and mandated to ensure that research proposals are scientifically sound and ethical, based on the examination of the requirements of ethical research. The primary mandate of ERBs would be to review research proposals before any data collection ensues. This process includes a rigorous scientific review and a detailed examination of ethical issues that may arise. This ensures research subjects are respected, are autonomous and not exposed to excessive risks without direct benefits. Additionally, ERBs would have a secondary mandate of protecting the integrity of their research institution from any misconduct that may tarnish their reputation and result in public mistrust.

A framework consisting of seven general requirements (see figure below) that make human subject research ethical is proposed. This practical framework would serve as a valuable tool to guide the review process conducted by ERBs.



Figure: Framework for Ethical Evaluation by Ethical Research Committee

The National Institute of Health (NIH) has been entrusted with the responsibility of promoting quality health research because of its mandate that situates it as the apex body for all health research in the country. It could be the responsible body to publish and disseminate guidelines in order to make health research more scientific and ethically sound. It needs to undertake unique steps with the contributions and inputs from various experts as well as from different disciplines by organizing workshops and meetings in order to publish these ethical guidelines.

## viii. Humanitarian emergencies in the framework of primary health care practices and approaches: a scoping review focusing on their mutually reinforcing goals and results to achieve

*Moderator: Khalif Bile, Chair NIH Board of Directors & Editor-in-Chief of the Somali Health Action Journal (SHAJ)*

### Background

The past few decades have witnessed a significant global increase in the prevalence of natural and complex humanitarian emergencies causing widespread destruction and generating the worst suffering in human history. Humanitarian crises directly affect more than 140 million people, over 65 million of which have been forcibly displaced from their homes. Out of these, over 45% belong to countries from the WHO's Eastern Mediterranean Region (EMR) and are driven by intense political and armed conflicts, causing unprecedented levels of mortality and morbidity. The major EMR epicenters of these crises are seven of its member states, namely Afghanistan, Iraq, Libya, Somalia, Sudan, Syria, and Yemen have suffered catastrophic public health consequences, mostly affecting mothers, children, and adolescents.

### Objectives

The panel presentation and discussions were based on a review aiming to study the primary health care (PHC) practices and approaches in health emergency situations and the necessary adaptations to introduce in the humanitarian response to enhance access to lifesaving health interventions. The initiative also aimed to offer the opportunity to draw lessons about the knowledge gaps to be filled within health staff to improve the health of affected populations.

### Methods

This panel presentation is based on a scoping review conducted by a team led by the author for the East Mediterranean Region of WHO. The study was pursued to gather the existing knowledge and practices both from peer reviewed and other publications focusing on member states of that region. The review mapped the technical and operational aspects generated by the humanitarian health interventions in the context of PHC service delivery structures and functions. The implementation of different humanitarian interventions within the PHC framework were reviewed. The pursued operational strategies were those categorized across the WHO's six health system building blocks (HSBB), linked to active training and effective early response and recovery during the fight against such disasters.

### Results

- The review outlined that the seven indicated EMR countries were afflicted by multiple natural disasters or armed conflicts leading to complex humanitarian emergencies and a protracted crisis with highly catastrophic public health consequences. It was noted that PHC was the most effective approach for generating unity of purpose and mutually reinforcing humanitarian response interventions while garnering opportunities for wider implementation coverage.
- The operationally pursued PHC structure of service organization was positively influenced by HSBB for strengthening service delivery, health information, leadership and governance, workforce, essential medicines, vaccines and technologies and financing.
- The epidemiological surveillance, using the WHO's Early Warning, Alert and Response Network (EWARN) is a network of health partners that collect and report surveillance data on selected epidemic-prone diseases. This has in turn significantly improved the disease outbreak detection in emergencies. The disease early warning system (DEWS), focusing surveillance on priority

communicable and vaccine preventable disease in the planning of humanitarian health services' delivery interventions, places them at the center of health emergency responses in EMR countries' complex emergencies.

- Community based interventions involving households through the PHC system effectively improved the disaster awareness and readiness, while providing the requisite advance notice concerning the likelihood of disease outbreaks and undertaking the relevant response interventions.
- An intervention to be launched at the outset of humanitarian emergencies and sustained is child routine immunization, as even in countries with effective coverage, disasters have led to the re-emergence of earlier well controlled diseases such as polio, measles, and pertussis.
- Certain consequences of war or conflicts are affecting these communities, especially children subjected to internal displacement, or with deceased or missing parents, lower access to safe drinking water, sanitation, and nutrition. In these situations, scaled up PHC delivery services are immediately required.
- The PHC health facilities should provide the designed standard EPHS in which a priority is assigned to reproductive health (RH) interventions supported by a trained health workforce, while mainstreaming other activities such as integrating the prevention, treatment, and care of mental health conditions and other noncommunicable diseases.
- A crucial role is played by community health workers (CHWs) to support the delivery of basic health care at the doorsteps of the families residing both in the rural areas and urban slums and to consolidate the effectiveness of PHC services in humanitarian settings, especially among underprivileged communities.

## Conclusions

- Improve information and management coordination among all stakeholders at all levels in disaster preparedness, response and recovery producing effective outputs, outcomes, and impact.
- Support capacity building at all tiers to bridge knowledge gaps concerning technical, logistic or managerial aspects of the humanitarian response efforts in all affected countries and improved leadership and governance as well as the effective implementation of various programs and interventions.
- Introduce the disease early warning system and put it in place as soon as practicable in the aftermath of a disaster, while ensuring its integration into the PHC network of the health services, to investigate and mitigate disease outbreaks.
- Enable the linking of humanitarian interventions to the PHC infrastructure and ensure that the delivered package of services is coordinated with humanitarian activities of disaster risk and vulnerability reduction, preparedness, response, and resilience building in a way that serves the needs of the population.
- Integrate the prevention and management of noncommunicable diseases into the humanitarian health response interventions, especially in protracted emergencies to reduce their burden.
- Promote the undertaking of implementation/action research in humanitarian crises to bridge knowledge gaps by generating evidence of importance for improving the effectiveness of emergency response interventions, and their uptake and translation into policy and practice by all engaged humanitarian health partners.

## ix. Who published what on Somali health issues? A bibliometric study 1945-2020

*Stig Wall, Emeritus Professor, Department of Epidemiology & Global Health, Umeå university, Sweden*

### Background

There are three dimensions of the health gap – health itself, resources for health research and the access to health information. Fragile states like Somalia are disadvantaged on all three dimensions. Low income and fragile countries like Somalia still lack smooth and reliable access to health information, both from the global and national as well as at the local level. The new era of open access publishing of scientific research may be a lever for amending the third gap.

### Aims

The aims of the study are to examine the past and present patterns of dissemination of information and research on Somali health issues and specifically ask questions about who initiated the research, the positioning of Somali authors and institutions, the origin and analysis of data and what topics were addressed. The ultimate aim was to serve as a *raison d'être* for initiating the Somali Health Action Journal as a forum for disseminating and sharing health information of relevance for Somalia.

### Material and methods

We opted for a bibliometric study to describe the patterns of publications on Somali health issues. Referring to our aims above and in order to capture core medical and health issues, we chose to use all data bases offered by Web of Science as of 1945. To arrive at a search string to be used for selecting the study population of articles, we successively added relevant keywords, moving from broad to specific categories until we reached saturation. This search string was then applied on the whole study period 1945-2020, generating a total of 2,824 papers. A sample of 454 papers, stratified by time periods motivated by different societal and academic eras in Somalia, were read and classified by relevance and information to address the above questions.

### Main findings

- During pre-independence and pre-academia, papers were authored by non-Somalis only
- During the past 20 years more than half of relevant papers were authored by non-Somalis only
- One out of three relevant papers included a Somali-affiliated author
- One out of five have Somali affiliated first authors
- One out of ten have Somali affiliated last authors
- Funding information was lacking for more than a third of the papers
- Very few were stated as having national funding

### Conclusions

The study raises concerns about the scarcity of research publications on Somali public health issues. This points to the need for research capacity strengthening in general with special attention to the important role of the newly established Somali universities. We note a lack of balance regarding the topics and public health relevance of published papers in relation to the burden of prevailing health problems which calls for efforts to set research priorities in tune with the broad needs of the communities. Another observation is that the papers reviewed indicate a heavy dependence of

the research agenda on external organizations and funders, which calls for active attention to research ownership issues in terms of Somali leadership and authorship. There is a lack of dissemination channels for Somali based health research and limited possibilities for young Somali scientists to publish their studies. As a Somali-owned journal, we envisage that SHAJ can play a catalytic role in the promotion and dissemination of “Essential Somali Health Research”.

#### x. **Translating Research into Action: Strengthen Health Research Partnerships and Collaboration**

*Khalif Bile, Chair NIH Board of Directors & Editor-in-Chief of the Somali Health Action Journal (SHAJ) and Board Member of Somali Swedish Researchers’ Association*

##### **Background**

Research partnerships and collaboration will bring together researchers, the academics and research institutions both national and international; individual researchers, beneficiaries, and stakeholders as well as policymakers, practitioners, organizations, patients, public health professionals, clinicians, health system managers, research funders and the community/the public with the process of generating and using knowledge and evidence for improved healthcare.

Health research is necessary for the advancement of population health and national development, with particular focus on developing countries where significant challenges are being faced in terms of human resource expertise, institutional capacities, and availability of adequate financial resources. These limitations raise the imperative necessity to build health research partnerships in order to bridge the existing health research gap, bringing locally generated solutions to the weak healthcare systems, and the high burdens of disease, mostly affecting the underprivileged population groups with sustained poverty conditions. In Somalia, research partnerships and networking are critical for its evolving health institution such as the NIH, the large number of the newly established academic institutions in the country as well as the health services’ delivery network. The disruption that took place in the country in the past three decades has produced a weak health services system, with limited infrastructure and human and financial resources that are necessary to improve their productivity, quality, and capacity. The humanitarian challenges that are repeatedly affecting the country every year have generated large population displacements, and security challenges impeding access to basic lifesaving health interventions in many districts of the country. The humanitarian responses have also been supported by a plethora of national and international organizations operating in the field with limited coordination and integration of the service delivery system. To overcome these challenges, a comprehensive essential package of health services (EPHS) was jointly planned by the government health sector and health partners. The program requires the health partners to unify and coordinate their implementation efforts in post-conflict contextual realities in terms of health priorities, the health network infrastructure, the access to care and care seeking and utilization behaviour.

The intended research partnership between local, regional, and international partners is also aimed at strengthening the weak national health research capacity with focus on the training of academic and health professional groups, facilitating the needed technology transfer, and mobilization of the requisite financial resources. These capacities will enable NIH, the Somali academic institutions, and the national health services’ system to generate research evidence needed to solve the challenges facing the health system and disseminating these solutions across the country. This will transform these institutions from solely knowledge consumers to knowledge producers as well.



### **Aims of Research partnerships**

- To build and scale up the capacity of national institutions drawing on the partners' expertise and address complex operational issues and translate these into policy and practice.
- To address the paucity of human and financial resources by attracting grants and making operational research an integral part of the program implementation.
- To create opportunities for academic research training by facilitating the learning of new skills and engage in research partnerships with reputed international institutions and closely interact with experts on all the priority health research fields across the country including the development of health research ethics guidelines.

### **Promoting and Building Research Partnerships**

- To build solid health research partnerships, it is necessary to focus on how to strengthen the national health research systems, through well-coordinated strategies and coherent approaches of implementation that are flexible and creative in their collaborative research activities
- To make the capacity building and governance, research financing and production the central pillars that constitute research partnerships that place research as an integral component of the health development process.

### **Elements in research partnerships**

- Streamline the partnership's research planning agenda and related health research needs assessment, and thus setting the national health research priorities
- Plan jointly with the research partners, the capacity building of the health research training programs and their processes of implementation
- Pursue evidence-informed policy approaches by promoting the use of the generated research evidence for policy and practice
- Establish a relationship built on trust, credibility, respect, dignity, and transparency, recognizing the diverse expertise and decision-making, being shared in a platform founded on equity.
- Address jointly with partners the ethical issues related to the collaborative research activities

### **An action agenda for research partnerships**

- i. Establishing partnerships which meaningfully contribute to the development of health research and positively impact the health care service delivery through:
  - Enhanced research capacity building
  - Building research infrastructures (IT and library capacities)
  - Establishing special research committees and supportive managerial steps
  - Designing research budgets
  - Establishment of Demographic Health Surveillance System Sites and Conduct Rural Health Research and Rural Needs Assessment
  - Establishing contacts with the health sector to link research to policy and practice
  - Promoting models of Somali inter-university academic partnerships & research collaboration networks

ii. Resolving the research barriers through:

- Mobilisation of adequate human and financial resources
- Reducing the concerns about the research quality
- Developing a sufficient level of trust amongst research team members
- Bridging the power, knowledge, and skills imbalances amongst the team
- Addressing the inadequate professional incentives and formal remuneration of researchers and their motivation by the health system and academic governing bodies
- Building adequate and sustainable research infrastructure through the provision of the required necessary facilities and equipment

iii. Partnership Research Gaining Momentum

- Partnership research has become more prevalent and is becoming a priority by attracting grants to the research active academic and health system institutions
- Partnership research projects promoting equality and health equity
- Supporting research co-production by researchers and knowledge-users
- Research providing benefits in terms of outcomes and impact
- Establishing promising approaches to translate the findings into policy and practice.
- Develop research partnerships into a long-term collaborative relationship

iv. Establishing Community Based Partnerships: A Critical Juncture for Universal Health Coverage (UHC)

- Addressing the poor health literacy by developing functional health literacy skills
- Promoting community participation by:
  - a) Obtaining information on health risks and averting them using the relevant mechanisms embedded in health system.
  - b) Engaging the community in the prevention and control of diseases and the elimination of culturally harmful practices and by the provision of immunization services, ANC, colostrum feeding, EBF, cholera prevention and control, and raising awareness about TB, HIV/AIDS & mental health issues; and
  - c) regulating the practices of traditional healers through awareness building and implementation of norms of compliance.

v. Directing Partnerships to Tackle Inequalities in Public Health

- Directing partnership research on poverty-related and neglected tropical and infectious diseases, which constitute the main causes of death, disability, and ill health
- Increasing research focus on emerging and re-emerging pathogens such as COVID-19 in the framework of the health system and through intersectoral collaboration
- Addressing the constant rise in antimicrobial resistance that reduces the efficacy of existing treatments and the need to regulate the prescribing patterns of professionals and significantly reducing over-the counter sales of these medicines.

## xi. Scientific writing and publishing – some rules and sins

*Stig Wall, Emeritus Professor, Department of Epidemiology & Global Health, Umeå University, Sweden*

### Background

Publishing in scientific journals is competitive and may for young scholars be a hard experience if not mentored by senior professionals. Advice and basic tools are needed to avoid discouraging young researchers from entering into a career with many obstacles but they should also be guided into an exciting field where they will use their curiosity to work for a good cause – people's health.

### Aims

This presentation will address some basic rules and deadly sins in publishing, give criteria for authorship and advice on how to respond to peer-reviews.

### Main messages

*Some "truths" about writing:*

Publishing is often a lengthy process but also rewarding and all manuscripts will most certainly pass through many versions before submission. All papers also probably benefit from reducing the size and condensing the presentation. This increases the readability which also increase the likelihood that reviewers will recommend acceptance. A general rule is that the last 10 % of efforts by the author means 50 % of the outcome result, i.e a favorable recommendation from the reviewers. The title catches the interest of the reader, and every article needs a conceptual and stylistic frame. This is why one should "write", i.e think through, the entire paper before analyzing the data.

*Before writing:*

There are a number of questions that one should ask oneself before starting to write.

- Who will be interested in reading it?
- What will they learn?
- What is new, exciting?
- How will the editor react?
- What possible journals would be interested?

Some rules that are not negotiable:

- Read and follow Author Guidelines
- The peer-review evaluation is meant to improve your article
- Address the peer-review evaluation and motivate but you need not buy everything

There are three deadly sins in scientific writing:

- Falsification, e.g. to edit your data to better fit the expected findings
- Fabrication, e.g. to invent data to produce expected findings
- Plagiarism, to steal ideas or results from others without recognition of origin

“Plagiarism is the appropriation of another person’s ideas, processes, results, or words without giving appropriate credit, including those obtained through confidential review of others’ research proposals and manuscripts”. (Office of Science and Technology Policy, 1999)

“Self-plagiarism occurs when authors reuse their own previously written work or data in a “new” written product without letting the reader know that this material has appeared elsewhere”. (Roig, 2003)

The field of public health is multidisciplinary which requires input from several competencies. This means that a paper will commonly have several authors. It is then of utmost importance that they agree beforehand on and comply with criteria for authorship as they have been stated by the scientific community: <http://www.icmje.org>. These criteria can be graphically displayed as below.



### 4.3 Conference Proceedings: Presented Research Abstracts

#### 4.3.1 Health systems

##### 1. Promoting partnership and local ownership: a case study of how donors engage in the Health Care Sector in the Jubaland State of Somalia

Jamal A. Mohamed<sup>1</sup>

*Introduction:* Protracted conflicts in Somalia affected the delivery of health services with negative consequences. International and local organizations responded to provide essential health packages to the communities. This study was aimed at examining how donors coordinate and collaborate with the

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Jubaland State of Somalia (JSS) to promote meaningful partnership and local ownership to improve health care services.

*Methods:* This was a cross-sectional study based on literature review and interviews with key informants from international development partners and Somali government officials based in Somalia. Thirty-four key informant interviews were conducted using a semi-structured interview guide. The study examined how partnership and local ownership work in practice between donors and JSS and other local actors; the nature of coordination between the various layers (donor, state and federal) engaged in promoting health services in Somalia; and the extent to which power relations between these actors can affect meaningful partnership and local ownership of projects on the ground. Pfeffer's (1981) Power and Politics Organizational Model, which explains the role and influence of power in decision-making processes in organizational management was used in the analysis of data.

*Results:* The findings of this study show that (i) effective coordination is an important pillar in promoting meaningful partnership and localization of health projects in Somalia; (ii) donors face the challenge of achieving the dual goals of promoting "meaningful partnership" and "local ownership" of projects in a complex post-conflict reconstruction process; (iii) the process of state formation in Somalia, which has produced multiple layers of federal administrative blocks with different power structures, has further complicated the coordination of health projects; and there are overlapping efforts that affect the coordination of partnership and localization by different actors involved in health programmes in Somalia.

*Conclusions:* Donors face the dual challenge of promoting the goals of partnership and local ownership in a fragile and conflict-ridden environment. This becomes even more complicated in a context where there are different complex vertical and horizontal layers of administration. A health care coordination body dedicated to promoting meaningful partnerships and localizing health projects in JSS could alleviate the problems. Such facility could inform donors, local JSS administration, and others to strengthen health care delivery and address gaps in service delivery at various levels.

## 2. Linkages between Sustainable Development Goals in Somalia - A Focus on Health

Hassan W. Nor<sup>2</sup>, Rage M. Adem<sup>2</sup> Mohamed M. Fuje<sup>2</sup>, Nina Viberg<sup>3</sup>, Abdinor M. Hussein<sup>2</sup>, Tobias Alfvén<sup>3</sup>, Ahmed Y. Guled<sup>2</sup>, Mohamed M. Biday<sup>2</sup>, Daniel Helldén<sup>3</sup>

*Background:* The Sustainable Development Goals (SDGs) were internationally adopted in 2015. They comprise 17 universal and indivisible goals for sustainable development. However, the interactions between the SDGs in the Somali context have not been adequately comprehended. The current study aimed to identify, describe, and classify the linkages between the SDGs with a focus on health and well-being (SDG 3) in Somalia.

*Methods:* A two-day workshop on SDG linkages was conducted jointly by Benadir University (BU) and Karolinska Institutet (KI) on November 16-17, 2021, in Mogadishu, Somalia. Following the SDG Synergies approach, 35 key stakeholders from the public sector, private sector, academia and civil society were brought together for a workshop. They scored each individual interaction between the SDGs, with the exception of SDG 17, on a seven point-scale from -3 (highly restricting) to +3 (highly promoting). Each score was briefly explained. Based on this, a cross-impact matrix was created, and network models were used to showcase the direct and indirect interactions between the SDGs with a focus on SDG 3. The entire scoring was validated by all stakeholders and ultimately consensus was reached on all interactions.

*Results:* The cross-impact matrix reveals many promoting and a few restricting interactions between the different SDGs. Overall, SDG 16 (peace, justice and strong institutions) and SDG 7 (sustainable energy) seem to influence the other SDGs the most. Intriguingly, progress on SDG 16 has the largest positive impact on SDG 3 when second-order interactions are considered. SDG 3 was found to be heavily

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influenced by progress on other SDGs in Somalia and making progress on SDG 3 was found to positively influence the possibility of making progress on all other SDGs. Furthermore, with regards to SDG 3, there seems to be a positive feedback loop in which progress on SDG 3 enables improvements on other SDGs that in turn enable progress on SDG 3.

*Conclusions:* The findings illustrate the importance of a multi-sectoral approach to accelerate work toward achieving the SDGs in general and SDG 3 on health, specifically in Somalia. In addition, the workshop provided an opportunity for a practical and lively interaction between stakeholders that can lead to new and closer collaborations to harness the synergies found and mitigate the trade-offs. The interactions between the SDGs is key to progress on SDG 3 (health and well-being) in Somalia, and special consideration should be made improving SDG 16, as this might have the largest positive effect on health and sustainable development in Somalia.

### 3. Evaluation of Universal Health Coverage of Maternal Health Policies and Programs in Low/middle-Income Countries (LMIC): A Scoping Review Protocol

*Jamila Aden*<sup>4</sup>

*Background:* Maternal health care is a health priority globally and nationally. As part of the global agenda, LMICs have implemented maternal health policies to improve the accessibility and utilization of maternal health services. This scoping literature review aims to understand the overall context, policies, and programs for achieving Universal Health Coverage (UHC) of maternal health services at a global level and to examine the progress towards achieving UHC of maternal health services in LMICs. Moreover, the review aims to map the methodological approaches and indicators used to evaluate the progress.

*Methods:* The scoping review will adopt the methodological framework proposed by Arksey and O'Malley and refined by Joanna Briggs Institution. Literature research for peer-reviewed journal articles related to the impact of maternal health policies in Somalia published from 1991 to the present will be conducted on the following databases: Web of Science, Medline, Scopus and ScienceDirect. Pre-set criteria for screening and appraising relevant articles will be developed using the 'population-concept-context' framework. The screening will be conducted by the principal investigator and checked by a colleague. Data from the reviewed articles will be extracted and charted using descriptive numerical summary analysis and qualitative thematic analysis. This evaluation protocol will include a table of concept grid of keywords for the initial search and a table of data extraction framework.

*Conclusions:* This scoping review protocol will inform about the effectiveness of UHC of maternal health care policies in reducing maternal mortality in LMICs including Somalia. Furthermore, the study findings from these policies' evaluations will inform policymakers and stakeholders to plan, prioritize, fund, and implement quality, effective and evidence-based programs and practices to improve maternal health outcomes. Additional benefits to be gained from the dissemination of this protocol in terms of research capacity building specially in Somali context include providing tools and techniques to identify theoretical and methodological approaches used to evaluate health care policies in Somalia and in general raise the knowledge of Somali based researchers to conducting a scoping literature review study. A limitation of the study is by including only English-language publications, where relevant articles may be excluded.

### 4. Systematic Review of the Post-Conflict HealthCare System in Somalia from 2000 to 2020

*Adam Sheikh Said*<sup>5</sup>, *Kicha Dmitry Ivanovich*<sup>5</sup>

*Background:* Somalia, formerly known as the Somali Democratic Republic, is a coastal country in East Africa with a population of about 16 million in 2020. Somalia's health-care system is underdeveloped,

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underfunded, and unequally distributed. The goal of this review article was to conduct a comprehensive evaluation of previous literature on Somalia's health-care system. The literature covered the years 2000 through 2020. Several national and international research papers were examined, including content published in a peer-reviewed journal or as part of a formal scholarly program. Only English-language literature was considered. Abstracts, correspondence, case reports, literature reviews, and NGO reports all include interviews and cross-sectional surveys. Meanwhile, the various outcomes in the research's results and discussion sections have been kept in mind. Some statistics have been added to the document. As Somalia has been highlighted for its political instability, which is thought to be leading to chronic health crises and a poor health care system, this review paper aims to analyze the literature on Somalia's post-conflict health care system and fill the various study gaps and obstacles hindering proper research on the Somalia health care system.

*Methods:* We conducted a literature review of health care in Somalia for the past 20 years (2000-2020). This review has a systematic type and includes a description of the experimental design. Articles were published in either a peer-reviewed journal or as part of an educational program receiving formal review. Using the resources of the search engines Scopus, Google Scholar, PubMed, WEB OF SCIENCE analysis of the literature on this issue shows that other research organizations of the WHO Bureau of EMRO and the African Development Bank Group. A quick overview of Somalia for the keywords as mentioned above has been done. All studies meeting minimum eligibility criteria were reviewed using online databases regarding Somalia-based co-authorship, research topic, and specific quality measures for this meta-analysis. We used articles containing public health materials for the Somali population on the most current issues related to public health and the state of transformation over the past 20 years. We also reviewed Somali expert professionals in the field of public health working last 20 years in the Somalia health system.

*Results:* Almost 50 studies have been reviewed in this paper, including the journal articles and surveys done from 2000 to 2020. Of these, only 36 (46%) had co-authorship by Somalia-based researchers. These papers have been retrieved from the science web, Scopus, PubMed, and NCBI. Of the 20 studies reporting ethical approval, 16 (64%) received approval from the Somalia Ministry of Health, which is published in Somalia Health and SDGs short documentation, along with the journal of health system profile Somalia. Five received permission from a university or national commission. Twelve papers were sourced from WHO; more than two-thirds of published research was limited to a few areas of investigation, with most (51%) following basic cross-sectional study designs. There are some surveys, case studies, and interviews are included which are conducted by 3rd party. These case studies are included from different scientific websites like academia, BMC (conflict and health), etc. Similarly, we used 3 articles from the health care system website and the website of Regional Health Systems Observatory - EMRO. Furthermore, the number of articles has also been observed from 0 to 5 per year in 2000–2005 to a maximum of writing pieces in 2010-2020. Furthermore, long periods of conflict and instability have made Somalia a quintessentially fragile state. The current health infrastructure has been damaged because of this continuous instability, and effective institutional investment in quality health care has been prevented.

*Conclusions:* This is the first study in post-conflict Somalia to use a systematic review of the health system. Our findings reveal that research into Somalia's health system is currently limited.

The study highlights the need for the Somali government to develop regulatory mechanisms and guidelines that can guide health care system to provide adequate and affordable health care.

## 5. Role of Assistant Community Based Midwifery in Maternal Health Care System in 12 remote rural villages of Bari and Karkaar regions of the Puntland State of Somalia

Abdikani Said Farah<sup>6</sup>; Mohamed Abdulkadir Yusuf<sup>6</sup>; Osman Ismail Ahmed<sup>6</sup>

*Background:* The present study explored the role of Assistant Community Based Midwives (ACBMs) in mother and newborn health care. The ACBMs have been distributed in 12 different villages in Bari and Karkaar regions to provide basic health care, to assist during and after pregnancy and childbirth. Most of the maternal and newborn deaths occur in the rural areas due to poor health system, inadequate care before, during and after delivery.

*Objectives:* The main objective of this study was to assess the role of ACBMs in providing health services for pregnancy women and childbirth in rural villages and communities of Bari and Karkaar Regions of Puntland.

*Methods:* The present study was conducted in 12 villages in the rural areas of Bari and Karkaar regions of Puntland. Married female residents in these villages who had completed their primary or intermediate education were selected to be trained on maternal health care service and the project was implemented by Aragan Health Organization (AHO), a local non-governmental and not-for-profit organization focusing on reproductive, maternal, newborn and child health services. This was undertaken in collaboration with the Bari regional health officer and the Citycode training college in Bosaso. The selection of these 12 women was aligned with the WHO community health workers' selection criteria and the training curriculum designed was approved by the Ministry of Health, and the regional health authority. The training was held in the Citycot College in addition to practical training in Bosaso General Hospital and in 6 MCHs in Bosaso. Upon completing the training program, each woman received a delivery and a Neonatal resuscitation kit. Data on services provided to mothers i.e. antenatal care, assisted delivery, high risk pregnancy referrals, and postpartum care were collected by the ACBMs. Under 2-year-old children's nutrition and their most common health problems faced between July and November 2021 were collected through the monthly reports submitted by the ACBMs.

*Results:* Between July and November 2021, a total of 517 pregnant women were contacted through home visits by the 12 ACBMs to deliver antenatal care services. Of these, 224 pregnant women were referred to the nearest district or regional health facilities. 146 deliveries were assisted by the ACBMs of which 2 women died, one during labor and one after delivery, while 23 deaths of neonates in the first 23 days of their lives have been reported by the ACBMs. The remaining 147 cases were during the prenatal period. Most of the cases were referred to Bosaso General Hospital, located 300-400km from these villages or Balidhidin District Health Center, 100-150 km away from these villages. Among the referrals, 30 cases had vaginal bleeding, 51 cases had prolonged labor and 19 had infections during the puerperium period. During the same period, 564 children were examined by the ACBMs. Of these, 135 were diagnosed as malnourished.

*Conclusions:* This study revealed that the ACBMs play an important lifesaving role in maternal and child health care by providing antenatal care during pregnancy and assisting normal deliveries with postpartum follow up services to remote and hard to reach villages. They are the only primary care providers for these underprivileged communities. In view of the above, we recommend the replication of this successful initiative and develop strategies for their effective supportive supervision and provision of supplies. The government should also link this community program with the district health services and ensure the provision of a standard remuneration for the sustainability of this innovative and vital intervention.

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<sup>6</sup> Aragan Health Organization (AHO)



## 6. Factors affecting practice of hand hygiene among adult women: a case study of Wartanabadda District, Benadir Region

Abdiaziz Aden Hashi<sup>7</sup>

*Background:* Hand hygiene has been considered for decades as the single most effective and efficient means of preventing hospital acquired infection, as well as an effective means of preventing hygiene related illness in the community.

*Objective:* The main purpose of this study was to assess the level of hand hygiene practices among adult women at Wartanabadda.

*Methods:* A descriptive, cross-sectional study was used. Main variables include socio-demographic characteristics, familiarity of hand hygiene, and hand hygiene practice. Four hundred participants were interviewed using a structured questionnaire. The sample was selected from adult women in all five sections of Wartanabadda district. The researcher trained five medical students for data collection assistance. Fieldworkers were instructed to visit the houses of selected areas and seek the consent of the head of the household to undertake the questionnaire, and the accepting respondent was asked to complete the questionnaire. SPSS with Binary logistic regression were used for data analysis, univariate and bivariate also conducted.

*Results:* The results showed that 51% of respondents did not know the importance of hand hygiene, 79% of respondents never attended trainings about hand wash, and about 66% of respondents never used hand sanitizers. Respondents asked whether they wash hands or not after change baby diapers and approximately 62.5% answered negatively. Participants were also questioned on whether they wash their hands after visiting hospitals and 65.5% mentioned that they never wash their hands after visits to the hospitals. Looking for factors affecting hand hygiene practice, we compared the importance of hand hygiene practice to human health that were significantly associated ( $P=0.000$ ) COR 2.547 (1.702-3.812). The high association between training and hand hygiene practice was shown, where women attending hand hygiene training were seven times more likely to practice hand hygiene ( $P=0.000$ ) COR 7.223(4.0483-12.778), compared to women who never attended training on hand hygiene. Moreover, there was an association between hand hygiene practice and the use of warm running water ( $P=0.871$ ) COR 1.186 (0.698-2.014).

*Conclusions:* This study indicated that most women did not sufficiently value the importance of adequate hand hygiene practices. This study highlights the number of issues associated with poor hand hygiene that include low level of education among most women, lack of awareness, lack of information receiving through public institutions, lack of mobile teams that make interventions at the household level, poor understanding of effective hygiene and hygiene practices and inadequate training. Most (79%) of the respondents never attended hand washing training. The government and other relevant institutions/organizations should be aware about this issue through awareness and education using media such as TVs, while health institutions should educate the public about the use of hand sanitizers and disinfectants.

## 7. Knowledge, attitude & practices of hand washing among mothers in Badbaado IDP camp, Dharkenley district, Mogadishu, Somalia

Hafsa Mohamud Mohamed<sup>8</sup>, Abdiaziz Mukhtar Mohamed<sup>8</sup>

*Background:* Hand washing is the rubbing together of all surfaces and crevices of the hands using soap or chemical disinfectants and water. A washing time of 10 to 15 seconds is recommended to remove transient flora from the hands. Handwashing is one of the most cost-effective *Public Health* interventions to reduce communicable diseases that include the Acute Respiratory Infection (ARI). To stress the essentiality of handwashing, October 15 has been proclaimed as the Global Hand Washing

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<sup>8</sup> Benadir University, Mogadishu, Somalia

Day since 2008. There was not enough available data on handwashing in Mogadishu leading to the need for this study to be conducted.

*Objective:* The general objective was to assess the knowledge, attitude and practice of hand washing among mothers in Badbaado Internally Displaced People (IDP) Camp located in Dharkenley district in Mogadishu - Somalia.

*Methods:* This research was conducted from February 2020 until August 2020. The research applied community-based, descriptive cross-sectional study, of quantitative and qualitative approaches. The targeted population was mother's resident in Badbaado IDP camp with the sample size of 352 respondents acquired through random sampling. Prior to the data collection, respondents' consent was sought. By administering a close-ended questionnaire using the data collection platform Kobo Collect, we were able to gather quantitative data. There were 22 questions for the quantitative data collection, and these were as follows: 6 on demographics, 6 on knowledge, 5 on attitude and 5 on practice. On the other hand, the Focus Group Discussion (FGD) was conducted using open-ended questions consisting of seven questions with a group of selected mothers. The quantitative data was analyzed using the software STATA (version 15.1), while the qualitative data was presented in a summary form.

*Results:* When it comes to mothers' knowledge in regard to hand washing, most of the mothers (72%) were aware of hand washing procedures in general. Additionally, almost half of the samples (56%) were able to identify the critical times (after defecation, after changing diapers, before preparing food and after eating) of hand washing. Looking at the attitude of mothers towards hand washing, about half of the respondents (43%) were comfortable with their hand hygiene practices; even though more than half of the respondents (66%) believe that hand hygiene products have negative impact on their hands. When it comes to practices of mothers towards hand washing, most of the mothers (80%) wash their hands three times a day. Among those that wash their hands regularly, they only use water and practice hand washing at critical times only. During the FGD, the responders were asked to re-enact the hand washing steps. It was observed that their enactment was rather incorrect.

*Conclusions:* The responders have good knowledge about hand washing and the majority of them believe the hand washing is important to their health. Furthermore, this study identified that 66% of respondents think that hand hygiene products have negative impact on their hands. Lack of resources, mainly soap and water, and inadequate sanitation facilities could be the two main reasons mothers do not wash their hands. As a result, the study recommended the development of a water system in Badbaado camp to the Ministry of Water, local government and organizations. The Ministry of Health was also urged to implement a hand washing program to raise awareness in the community.

## 8. Medical doctors' awareness of radiation exposure in diagnostic radiology investigations in Somalia

Ahmed Adam Osman<sup>9</sup>

*Background:* Diagnostic investigations using radiation have become a critical feature of medical practice in recent times. However, the possibility of doctors' underestimation of risks of over-exposure of patients to diagnostic radiation still warrants further evaluation.

*Objective:* The study aims to investigate medical doctors' awareness of radiation exposure in diagnostic radiology investigations in Somalia.

*Methods:* This was a descriptive cross-sectional study of the awareness of doctors about radiation exposure in diagnostic radiology investigations in Somalia. Online questionnaires were distributed to 200 participants through internet platforms across the country to avoid gatherings during COVID 19 pandemic period. Consent and approval of the participants was sought and obtained digitally before the questionnaire administration between August 2021 and December 2021. Our data analysis is descriptive with quantitative method, using univariate level analysis only for all variables.

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<sup>9</sup> Somali-Turkish Training and Research Hospital in Mogadishu, Somalia

**Results:** Results showed that of the 200 participants, 69% had no formal training on radiation exposure and 31% of them correctly estimated natural background radiation. Correct estimates of the effective dose from a single-view abdominal X-ray (AXR) were expressed by 10.5%, quantity of radiation of a single-phase computed tomography (CT) abdomen by 20% and dosage from a two-view unilateral mammogram by 12% of the participants. More than 70% of participants agreed that children are more sensitive to radiation, but only 11% suggested medical termination of pregnancy for a woman who had CT abdomen and pelvis with contrast. Dosage and risk of inducing fatal cancer from common but more complex imaging procedures were poorly understood. Radiology department doctors showed the highest percentage of knowledge in relation to their radiation awareness, while general practitioners were the highest intended target group for the study as most doctors in the country have no specialization.

**Conclusions:** Because of the high rate of poor awareness of radiation risks observed in this study, it is important to initiate, early in the medical curriculum for medical students, the need for a rotation in the Department of Radiology, similar to such rotations in other medical specialties.

## 9. Needle stick and sharps injuries and the associated factors among health care workers at SOS Hospital in Heliwa district, Mogadishu Somalia

*Nor Haji Osman Abdi*<sup>10</sup>

**Background:** Needle Stick Injuries (NSI) are among the most common occupational hazard for health care workers (HCW). Occupational exposure to NSIs is a significant source for transmitting blood-borne pathogens such as HBV, HCV, and HIV. Therefore, determining the occurrence and prevalence of needle stick injuries among HCWs in Somalia is necessary, particularly in lowering NSI. Wearing gloves and other preventive measures can reduce the risk of a needlestick injury.

**Objective:** The aim of this study was to determine the occurrence of needle sticks and sharps' injuries and their associated factors among health care workers in SOS Hospital, Mogadishu - Somalia. It also examines the preventive measures of needle stick injuries, gloves, safety boxes, plastic bags, and vaccination against Hepatitis B.

**Methods:** A hospital based cross-sectional study was employed using a questionnaire as a research instrument. A self-administered questionnaire was distributed to 210 respondents from different job categories of healthcare workers, doctors, nurses, midwives, laboratory staff, other technicians, and cleaners at the hospital who were selected as the sample size. Participation in the study was voluntary. Quantitative data was analyzed using statistical software Version 21 (SPSS) and simple percentages were used to describe categorical variables. Association between socio demographic factors, organizational factors, and environmental factors were determined using Chi-square test and Prevalence Odds Ratios. Level of significance was set at  $P < 0.05$ . Associations were examined using multivariate logistic regression. Those which were significant at bivariate were entered into logistic regression for further analysis to adjust confounders.

**Results:** In this study the prevalence of needle stick/sharp injury was 25.7%. Fifty-four respondents (25.7%) reported that they were exposed to needlestick/sharps injuries at the hospital, while most of the respondents 156 (74.3%) did not experience any needlestick/sharps injuries during their service at SOS hospital.

The study has shown that gender was associated with the prevalence of the needle stick and sharp injuries. Most of the participants were male, 116(55.8%), while the remaining 94(44.8%) were female. Males were almost two times more likely to be exposed to needle stick and sharp injuries than females. (OR 2.447, 95% CI 1.291-4.616). (P-value 0.04). Among the study population, 198 participants were between the ages of 15-35 (94.2%), while the remaining 12 participants were aged 36 and above (5.8%).

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<sup>10</sup> Benadir University, Mogadishu, Somalia

*Conclusions:* 25.7% of occurrence of needle stick/sharps' injury was demonstrated among health care workers in SOS hospital. This result is lower than a cross-sectional descriptive study conducted in Delhi where 79.5% of students were exposed to needle stick injury in the past 12 months. It is recommended that the SOS hospital management provide adequate protective equipment and safe medical devices that will minimize needle stick and sharps' injuries. There should also be some form of regular evaluation put in place.

## 10. Motivation of maternal health workers in conflict setting of Mogadishu, Somalia

*Naima Said Sheikh<sup>11,12\*</sup>, Abdi Gele<sup>12</sup>*

*Background:* Motivated health workers play an important role in delivering high-quality maternal health services, especially in low-income countries where maternal mortality rates are high, and shortage of human resources for health is prevalent. The aim of this study is to investigate maternal health workers' motivation in three tertiary hospitals in Mogadishu Somalia.

*Methods:* To investigate health worker motivation in Somalia, we used a semi-structured questionnaire that was validated and widely used in Sub-Saharan Africa. Data were collected from 220 health workers across three tertiary hospitals in Mogadishu between February and April 2020. Health worker motivation was measured using seven constructs: general motivation, burnout, job satisfaction, intrinsic job satisfaction, organizational commitment, conscientiousness, timeliness and attendance. A multivariate regression analysis was performed to determine the predictors of health worker motivation.

*Results:* The study found that male health workers have a higher work motivation, with a mean score of 92.75 (SD 21.31) versus 90.43 (SD 21.61) in women. A significant correlation was found between health workers' motivation and being an assistant, nurse, physician, pediatric-assistant, midwife, supervisor and pharmacist. Unexpectedly, the gynecologists and midwives were the least motivated groups among the different professions, with mean scores of 83.63, (SD: 27.41) and 86.95 (SD: 21.08), respectively. Of the aforementioned seven motivation constructs, the highest mean motivation scores (from 1-5) were observed in conscientiousness and intrinsic job satisfaction.

*Conclusions:* The results highlight the importance of targeted interventions that increase female health workers' motivation, particularly gynecologists and midwives in Somalia. This can be done by providing non-financial incentives, in addition to encouraging their participation in the decision-making process. Further research is needed to investigate the effect of a lack of motivation among gynecologists and midwives on maternal health in Somalia.

### 4.3.2 Reproductive, maternal, newborn, child and adolescent health

## 11. Determinant factors for the occurrence of tuberculosis among people living with HIV after ART initiation in selected public hospital in Mogadishu Somalia 2020

*Abdulkadir Mohamed Ahmed Keynan<sup>13</sup>*

*Background:* Tuberculosis is a major cause of death among HIV/AIDS patients. The risk of contracting tuberculosis in people living with HIV is believed to be 20-37 times higher than in people who have never been infected with HIV. Many patients in the developing world either have a history of tuberculosis when they initiate antiretroviral medication or develop TB while on it. As the CD4 count rises, ART reduces the risk of TB, but the increased risk of TB never goes away, even if CD4 levels return to normal.

*Objective:* To assess determinant factors for the occurrence of TB among people living with human immunodeficiency virus (PLWHIV) after ART initiation in public hospitals Mogadishu, Somalia 2020.

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<sup>12</sup> Somali Institute for Health Research (SIHR)

<sup>13</sup> Banadir Mother and Child National Referral Hospital

*Methods:* From July to December 2020, case-control research was undertaken in two public hospitals in Mogadishu, Somalia. The study's sample size was 75 people (25 cases and 50 controls). Adults living with HIV who developed tuberculosis after starting antiretroviral therapy and were on anti TB treatment in the six months prior to data collection were considered cases. Adults living with HIV who did not acquire tuberculosis after starting antiretroviral therapy (ART) served as controls. The data was gathered using an interviewer-administered structured questionnaire. To evaluate independent factors of TB among people living with HIV after ART beginning, researchers used bivariate and multivariate analysis with logistic regression.

*Results:* After adjustment for potential confounders, the presence of INH prophylaxis (AOR=.036,203; 95% CI: 0.03,0.45; P=0.03) had an independent protective benefit against risk of tuberculosis. Study subjects with baseline WHO clinical stage III or IV (AOR=1.35,323; 95% CI: 0.12,1.60), as well individuals with hemoglobin level <10mg/dl (AOR=(.042, 292; 95% CI: 1.02,9.07) were independent predictors for increased risk of tuberculosis in people living with HIV after ART initiation.

*Conclusions:* Increasing INH preventive therapy coverage lowered the overall risk of tuberculosis in HIV patients who began treatment. Patients with advanced disease (WHO clinical stage III or IV disease, hemoglobin level less than 10mg/dl) should be given additional attention to prevent the risk of new TB infection. It is also suggested that housing conditions and living standards be improved.

## 12. Knowledge, attitude and practices regarding induction labor among pregnant mothers utilizing services in Bosaso General Hospital

*Sharmake Hussien Abdi<sup>14</sup>; Asia Bashir Said<sup>14</sup>*

*Background:* Induction of labor is the process of artificially stimulating the uterus to start labor, which is usually performed by administering oxytocin or prostaglandins to the full-term pregnant woman or by manually rupturing the amniotic membrane. It is quite a common procedure used to deliver a baby. According to WHO secondary analysis study on the unmet need for induction of labor, African rates of labor induction are still much below the expected level. In Bosaso however, induction of labor and Caesarean section (CS) deliveries are commonly employed in obstetric care and have increased in frequency, consistent with global trends.

*Objective:* This study was conducted to assess the knowledge, attitude and practices towards induction of labor among pregnant mothers utilizing services in the Bosaso General Hospital (BGH).

*Methods:* A cross-sectional study design was used by administering a semi-structured questionnaire to 80 mothers in BGH using convenience sampling to collect the epidemiological data. The sample size was being determined using Slovene's formula ( $n = \frac{N}{1+N(e)^2}$ ;  $(e)^2 = (0.1)^2$ ) with n being the sample size; N being the Total population = 500 pregnant women utilizing services in BGH on average annually;  $e^2$ = margin Error  $(0.1)^2=0.01$ . Data were analyzed using Statistical Package for Social Sciences (SPSS) version 16.

*Results:* Eighty (80) mothers were interviewed of which more than half (52.5%) were 25-35 years of age while more than one third (35%) were 15-25 years old and a small proportion (12%) in the 35-45 year age group. 46.2 % of the respondents were married while 45% of them were either divorced or widowed. Around 21.2% of the respondents had not attended any formal education, while 36.2% had attended primary level education, 21.2% at secondary level and 19.2% had attended college or university. The majority of the respondents (85%) had no knowledge of the different methods of inducing labor, although 81.2% of them had received an induction labor earlier. In their opinion, 60%, 16% and 10% of the mothers, responded that prolonged labor, oligohydramnios, and diabetes were the main reasons for labor induction, respectively. An overwhelming majority (93.8%) of the respondents stated that the induction of labor was not expensive, however, 58.8% of them responded that the health

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center was far away from their home, constituting a barrier to accessing services. 62% of the respondents felt that the vaginal delivery was more painful than C-section.

*Conclusions:* This study revealed that although the rate of labor induction among pregnant mothers utilizing services in BGH is very high, their knowledge of the different methods of labor induction and its indications were low. Therefore, their knowledge should be improved through a focused approach of raising awareness and health education. The services also need to be closer to the doorsteps of the women through skilled community midwives.

### 13. Knowledge, attitude and willingness to accept cesarean section among pregnant woman attending antenatal care at Banadir Hospital Mogadishu, Somalia

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*Background:* Cesarean section (CS) is the operation for delivering a baby through incisions made in the mother's abdominal wall and uterus. It is one of the most performed major surgeries in obstetric practice intended to save the lives of the mother and child, significantly reducing maternal and prenatal mortality.

*Objective:* The objective of this study was to investigate Somali pregnant women's knowledge, attitude, and willingness to accept cesarean section in Banadir hospital, Mogadishu, Somalia.

*Methods:* This is a descriptive study conducted at Mogadishu's Banadir Hospital. 208 participants were chosen from a target population of 435 pregnant women who visited the hospital for antenatal care and delivery. The study was conducted over a period of 1 month (3<sup>rd</sup> April to 5<sup>th</sup> May 2021). The systematic random sampling technique was used to select respondents, with a sample interval of two. The inclusion criteria were met by any pregnant woman who was mentally and physically capable of being interviewed during the time frame specified, while those refusing to participate in the study, non-pregnant women, women with mental illness and severely ill patients were excluded. Data was collected using an interviewer-administered questionnaire. The survey was conducted by the Zamzam University Medical Faculty's graduated students' research team. The statistical package for social sciences (SPSS), version 25.0, was used to analyze the data.

*Result:* Of the 208 respondents, 31.7% were within the age group of 25-29 years. Most of the participants (92.8%) were married, 4.3% were divorced and 2.9% were widows. 62% of the women were multigravida. Over two-thirds (76.9%) gave birth through normal vaginal delivery. About 67.3% mentioned that CS requires a longer stay in hospital, 51% said CS may lead to admission to ICU, 82% considered that abnormal woman delivered by CS, while 89% mentioned that women who undergo C-section are at risk to die due to this procedure. However, 42.8% were willing to accept CS delivery if indicated, while over half (57.2%) responded that they were not willing to accept CS delivery, the main reasons being: fear of death (15.9%), C-section would lead to a disability (12.5%), non-acceptance by the husband (9.1%) and CS is an expensive procedure (8.2%).

*Conclusions:* The study concluded that most of respondents had inadequate knowledge and negative attitudes about CS. The study also revealed that the refusal rate for CS was high, leading to low rates even where indicated and was significantly contributing to raising both the prenatal and maternal morbidity and mortality. We accordingly recommend that this issue be addressed through mass awareness to change the attitude of pregnant women towards CS and dispel the myths leading to CS refusal.

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#### 14. Fertility outcomes after successful obstetric fistula repair: a retrospective study in Keysaney Hospital, Mogadishu, Somalia

Abdirisak Hassan Artan<sup>16</sup>

*Background:* An obstetric fistula is an abnormal opening between the vagina and the bladder/ureter or rectum of a woman resulting in constant leakage of urine and/or faeces (VVF or RVF) through the vagina. According to World Health Organization, obstetric fistula is the single most devastating consequence of obstructed/difficult labor to a mother in Sub-Saharan Africa, so this study intends to determine the fertility outcome after successful fistula repair.

*Methods:* A retrospective study has been conducted in 2021, using semi-structured questionnaire. Target population was 140 patients who were in their reproductive age, and who attended a fistula repair surgery in 2018. All participants had completely cured after the repair at Keysaney hospital. 94 respondents fulfilled the inclusion criteria, and were thus included in the study.

*Results:* The majority of respondents were between the ages of 15-20 years old (47.8%), while 34% were between 20-25 years old. Approximately 29.8% of our respondents were pregnant while the remaining were not. The estimated time between repair and pregnancy was less than 1 year for 48% of participants. Many of these pregnancies resulted in a live birth, and 10% of the women who became pregnant reported incontinence after delivery. Most of the respondents had normal menstrual cycle (70.2%). Abortion, postpartum hemorrhage and recurrence of the fistula were the major complications during labour.

*Conclusions:* Hospitals and fistula centers should ensure that their patients are provided with comprehensive educational counseling that emphasizes the need to wait at least 2 years before the next pregnancy, and in case of pregnancy, to seek appropriate antenatal care and institutional delivery.

#### 15. Achievements in improving maternal and neonatal Health care in Bosaso

Hinda Jama Ahmed<sup>17</sup>

*Background:* In Somalia, the maternal mortality ratio is one of the highest in the world. Maternal mortality is mainly caused by severe bleeding, placenta Previa, breech position and complications during delivery. Developing and implementing a strategy for action to contribute to the reduction of maternal and neonatal mortality is tremendously required. Ayaan Foundation for humanitarian assistance is erected/ constructed for a brighter future that is important to offer the community opportunities benefiting health care facilities that can implement and provide necessary adequate Emergency Obstetrics.

*Methods:* Established Ayaan Specialist hospital that directly addresses the shortcomings of existing infrastructure. It has set the standards required in terms of facility, equipment and supplies for comprehensive emergency obstetric and neonatal care (CEMONC) that implements advanced quality services. Recruited and run by highly qualified specialized doctors and well-trained midwives and nurses that are available 24 /7. In addition, the hospital has other specific specialties, clinical laboratory diagnostics, medical imaging, and safe drugs.

Hospital records of maternity clients provided data for quantitative analysis

*Results:* To provide access to the mothers regardless of their income, socioeconomic or health status to full package of CEmONC, a basic cost-recovery approach was supported by UNFPA, enabling all vulnerable mothers to seek this comprehensive care freely and attain a high-quality service. Starting from July to 30 December 2021, 691 women attended Ayaan S. Hospital. 253 women were full term mothers and 438 were there for antenatal care. Among the full-term mothers, 88 had a normal deliver and 165 were indicated for caesarean section by ultrasound. More than 86 % of the CSs were

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<sup>17</sup> Ayaan Specialist Hospital, Bosaso, Puntland State of Somalia

emergencies. All delivering pregnant women blood analysis is done for Hb, blood group and screening for HBsAg, HCV and HIV. The newborns whose mothers were HBsAg positive were given the hepatitis B vaccine within 24 hours. In addition, BCG and the Polio vaccine were administered, and a birth certificate provided. Anti-D was given to mothers who were Rh-ve and baby and father Rh+. The lives of all attended mothers and babies were saved except one with severe preeclampsia and two babies ingesting a lot of meconium.

*Conclusions:* The provisions of CEmONC saved the lives of mothers and newborns; and contributed in the reduction of maternal and neonatal mortalities. This indicates the importance of establishing CEmONC facilities in all public and private hospitals; building partnerships with the government and international partners to support the cost-recovery that will support the vulnerable families to seek care; the positive impact of such interventions in increasing the self-referral and institutional referral of pregnant mothers with high-risk pregnancy to such hospitals where cost-recovery support is operational; community awareness and knowledge about the danger signs of pregnancy complication and timely consent to save mothers and their newborns.

## 16. Gender roles and their influence on the sexual and reproductive health of youth in a post-conflict context.

*Gallad Dahir<sup>18</sup>, Fatumo Osman<sup>19</sup>*

*Background:* The sexual and reproductive health and rights of the world's 1.8 billion young people—24% of the population—are frequently overlooked, and young people aged 19–24 years are particularly vulnerable to poor sexual and reproductive health outcomes. Somalia has one of the world's highest fertility rates, at 6.6 children per woman of reproductive age, and early marriage is one of the factors influencing this. Poverty and lack of education, particularly for girls, may precipitate early marriage and gender inequality.

*Objective:* To understand the impact of gender roles on the sexual and reproductive health and rights of Somali youth.

*Methods:* An explorative qualitative study was undertaken. Four focus group discussions were conducted with 28 young men and women living in Mogadishu, Somalia—one with males only, one with females only, and two with both genders. The data were analyzed using thematic analysis.

*Results:* Three themes emerged from the analysis: “acceptance of combining work and family life”, “social impact on gender roles”, and “young people as agents of change”. Preliminary analysis shows that both young men and young women see the importance of women combining work with family life and of a partner who supports women's decision-making and that they viewed women's education as a benefit to society. The participants also highlighted society's influence on gender roles—noting that it favoured more traditional roles—but they perceived the younger generation as having different views on gender roles than older generations.

*Conclusions:* This study helps in understanding the views and perceptions of young Somali men and women regarding how gender influences sexual and reproductive health. Higher levels of education for both men and women were perceived to benefit society as a whole and cultivating a discussion of gender roles in sexual and reproductive health at an early age was viewed as crucial.

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### 17. Prevalence of intrauterine fetal death among women that gave birth at Benadir Hospital: 1 year retrospective, cross-sectional study

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*Background:* In 2015, the World Health Organization estimated that 2.6 million Intrauterine Fetal Death (IUFD) occur globally each year. The rate of IUFD is ten times higher in developing countries than in developed countries. This study aimed to determine the prevalence of intrauterine fetal death among women delivering at Benadir Hospital in Mogadishu.

*Methods:* A retrospective cross-sectional study was conducted to assess IUFD among mothers delivering at Benadir hospital between August 2020 to July 2021 using hospital registers. All delivered women with complete records were included in the study, and women with incomplete information were excluded from the study. The diagnosis of IUFD was made by obstetrician using ultrasound or fetal Doppler. All information on mothers with IUFD was collected using checklist which was adapted to the variables in the registry. Variables extracted included place of residence, age, gravidity, parity, duration of pregnancy, mode of delivery, weight of baby, and diagnosed pregnancy complication. Four qualified midwives and one supervisor were involved in data collection after receiving training in data collection tools. Descriptive analysis was performed and the prevalence rate of IUFD was calculated as the proportion of mothers with IUFDs out of the total number of mothers who delivered during the study period.

*Result:* A total of 7942 women gave birth in Benadir hospital during the one-year study period, of whom 335 had IUFD (42.1/1000). Of the women with IUFD, 26% (n=88) were between 15 and 20 years old, 48.7% (n=163) had more than five children, and 87.8% (n=294) delivered through the vagina spontaneously. Forty-three (12.8%) of the women had pregnancy complications such as antepartum hemorrhage anemia and pre-eclampsia. Moreover, 186 (55.5%) of the babies were full term, 134(40.0%) were pre-term and 15(4.5%) were post term and 141 (42.1%) delivered with normal weight. Two hundred-ninety-seven (88.7%) of the babies were macerated while 38(11.3%) were fresh death. Of the Out of 335 mother, 264 (78.8%) had singleton IUFD babies while the remaining 71 (21.2%) had twin IUFD babies.

*Conclusions:* The overall prevalence of IUFD was 4.2%. This calls for immediate preventive measures including creating community awareness as well as strengthening the care during pregnancy, child-birth and puerperium and correct diagnosis.

### 18. Factors associated with stunting among 6-59 months old children attending two public hospitals in Mogadishu, Somalia: A case control study

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*Background:* Stunting is one of the major causes of morbidity among under-five year children. Understanding factors associated with stunting is an important precondition for developing and strengthening nutritional intervention strategies. This study investigated the factors associated with stunting among children aged 6 -59 months attending two public hospitals in Mogadishu, Somalia.

*Methods:* A health facility-based case-control study was conducted between February 2020 - January 2021 at a public hospital in Mogadishu, Somalia. Stunted children aged 6 -59 months served as case studies while controls were those children of the same age group who were not stunted. A total of 64

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cases and 64 controls were studied. Data were analyzed using SPSS 20 and ENA Software. Descriptive statistics were used to summarize the data, and associations between exposure variables and stunted was assessed by odds ratio with a significance level of p-value < 0.05.

*Results:* Children coming from a family with more than one child of under five years were more likely to be stunted than those with a family size of one child (OR: 3.958, 95% CI, p= 0.017). Children of illiterate mothers were more likely to develop stunting than those with educated mothers (OR: 5.875, 95 % CI, p=0.014). Children who were exclusively breast fed for <6 months [AOR: 6.550, 95% CI, p= 0.00] were more likely to develop stunting than children who were exclusively breast fed for the first 6 months. Children were most likely to be stunted if they were given complementary feeding containing cow milk compared to those given other feeds (OR: 2.761, 95 % CI, p=0.032). Other risk factors included less frequent visit of antenatal clinic by mother (OR: 1.429, 95% CI, P=0.03), delivering at home (OR: 1.798, 95 % CI, p=0.00), not vaccinated (OR: 3.269, 95 % CI, p=0.028), family members used common public water point compared to those using tap water since (OR: 2.491, 95 % CI, P-value = 0.032).

*Conclusions:* The mother's education level, number of under-five children in the household, child vaccination status, place of delivery, duration of exclusive breastfeeding, and complementary food ingredients were associated with stunting. Thus, public health interventions working on improving child nutrition should consider these determinants. Keywords: Stunting, Children, Factors, Somalia.

#### 19. Factors associated with incomplete immunization among children aged 12-23 months attending WARDI Community Hospital Mogadishu in Somalia: case control study

Ja'far Abdullahi Omar<sup>26</sup>

*Background:* Incomplete immunization may increase the risk of diseases in children. Occurrence of vaccine-preventable diseases, in conjunction with poor immunization is a major public health challenge in developing countries. This study examined factors associated with incomplete childhood immunization in Somalia.

*Methods:* An unmatched case control study was conducted between December 2018 and August 2019 at WARDI Community Hospital in Mogadishu. Eighty cases and 80 controls were selected using the purposive sampling technique. The cases were children aged 12 to 23 months who had not completed the recommended vaccination schedules for Bacillus Calmette Guerin (BCG), pentavalent, polio and measles. The controls were children in the same age group but who had completed these vaccination schedules. A questionnaire was used to collect socio-demographic information and vaccination knowledge of parents, and health system factors. Descriptive statistics were used to summarize the data, and bivariate analysis was performed to describe associations between exposure variables and childhood immunization and assessed by odds ratio with a significance level of p-value < 0.05.

*Results:* Children of illiterate mothers were more likely to have incomplete immunization (OR: 2.708, 95 % CI; p-value was 0.000). Children of illiterate fathers were also more likely to be incompletely vaccinated (OR: 2.079, 95 % CI, p-value=0.006). In addition, a significant association was found between incomplete childhood immunization and parents' knowledge about immunization (OR: 2.008, 95 % CI, p<0.0001), immunization schedules (OR:1.640, 95 % CI, p<0.0001), immunization benefits (OR: 1.724, 95 % CI, p<0.0001) and side effects of immunization (OR: 1.666 95 % CI, p<0.0001). Health system factors that increased the risk of incomplete immunization of children included unavailability of immunization clinics (OR: 2.113, 95 % CI, p=0.006), home delivery (OR: 1.266, 95 % CI, p =0.001), lack of attendance at antenatal clinics (OR: 1.497, 95 % CI, p=0.001), and unvaccinated mothers (OR: 1.834, 95 % CI, p<0.0001).

*Conclusions:* The low level of education and poor knowledge (about immunization, immunization schedule, benefits, and side effects of vaccines) of parents as well as unavailability of immunization clinics, delivery at home, non-attendance of antenatal clinic and unvaccinated mothers were identified as risk factors for incomplete childhood immunization. The Ministry of Health should intensify its efforts

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and support for health promotion and health education on immunization and increase awareness on immunization and availability of immunization clinics.

## 20. Measles outbreak investigation Deynile district, Banadir region, Somalia

*Sadia Hassan Hussein*<sup>27,28</sup>, *Amelework Getinet Alene*<sup>28, 29</sup>

*Background:* Measles is an acute, viral disease caused by a Morbilli virus, usually in children. Humans are the only reservoirs. The transmission is usually person-to-person through aerosolized droplets or by direct contact with the nasal and throat secretions of infected persons. An outbreak was investigated for rapid implementation of control measures to decrease morbidity and mortality.

*Objective:* To confirm the existence of a measles outbreak and implement prevention and control measures in Daynile district of Mogadishu, October 2021

*Methods:* Data were collected using a line list and a modified case investigation form. Health facility registers and line lists were reviewed and a house-to-house case search was carried out to find additional cases. A case was defined as any person with a maculopapular rash with fever  $\geq 38.5^{\circ}\text{C}$ , with Coryza, conjunctivitis, a cough or epidemiologically linked by contact with laboratory confirmed measles cases. Immunization coverage and vaccine-storage facilities were assessed. Data were entered and analyzed using Microsoft Excel.

*Result:* From August 3<sup>rd</sup>, 2021, till October 17<sup>th</sup>, 2021, a total of 96 suspected measles cases epidemiologically linked to confirmed cases were reported from Daynile district. Of these, seven (7.3%) cases were confirmed by laboratory investigation (IgM positive). More than half of the measles cases 51 (53.1%) occurred in males while 83 (86.5%) cases occurred in children below five years. The mean age of cases was 30 months (3-168 months). The overall attack rate (AR) was 19.9/100,000 population. The age specific attack rates varied and was higher in children <5 years (123/100,000 populations). None of the reported measles cases were vaccinated against measles and only 8 cases (8.3%) were not eligible for measles vaccination schedule, being below the age of nine months.

*Conclusions:* A confirmed outbreak of measles occurred in Daynile district affecting primarily those below 5 years of age. Low vaccination coverage resulting from the unavailability of functional cold chain facilities significantly contributed to the outbreak. Efforts to strengthen the routine immunization coverage and supplementary immunization activities (SIAs) should focus on improvement in cold chain operation, while considering the internally displaced populations (IDPs) in the planning and allocation of vaccine needs to be emphasized in the district. In addition, enhancing the awareness of the community toward measles transmission with provision of cold chain maintenance at health facility level and strengthening the measles surveillance are required for prompt interventions to reduce the incidence rate of measles infection.

## 21. Prevalence and factors associated with anaemia among children aged 6 to 59 months attending Banadir hospital in Mogadishu, Somalia.

*Ibraahim Abdullahi Guled*<sup>30</sup>

*Background:* Anaemia is a global health problem affecting children in developing and developed countries with major consequences on human health and socio-economic development. The impact of Anaemia affects mostly children under five years of age. In Somalia, the prevalence of Anaemia in children below 5 years is 59.3 %, as shown by an earlier study. However, the underlying factors for Anaemia are not known.

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<sup>28</sup> Somalia Field Epidemiology Program

<sup>29</sup> African Field Epidemiology Network, Somalia

<sup>30</sup> Somali National University, Somalia

*Objective:* To determine the prevalence of Anaemia and associated risk factors among children under five years of age attending Banadir hospital in Mogadishu, Somalia.

*Methods:* This is cross-sectional study in children < 5years at Banadir hospital in Mogadishu, Somalia. Three Hundred and seventy-two children <5 years were enrolled in the study. Data was collected using a pre-tested structured questionnaire and measurements, which included: anthropometry, full blood count, stool specimen examination, microscopy for detection of helminthiasis, and a blood smear for malaria parasite examination in children and HIV test for the mothers. The quantitative data from semi structured questionnaires was sorted, edited and entered into Epi- Info version 3.5.1 software. We analysed the data with STATA version 12.0. The primary outcome of prevalence of Anaemia in children <5 years, and the independent factors associated with anaemia were determined using logistic regression.

*Results:* A total of 372 children were enrolled between December 2014 and Feb 2015 of whom 51.1% were Male. Out of the 372 children, 260 (69.9%) had anaemia; 11% had severe anaemia, 37.4% had moderate anaemia and 21.2% had mild anaemia. Failure to provide exclusive breastfeeding was independently associated with anaemia [OR 2.37 (95%CI: 1.26 – 4.62)]. A mother having at least a secondary school education [OR 0.22 (95%CI: 0.08 - 0.59)], maternal age 25 – 35years [OR 0.58 (95%CI: 0.08 - 0.788)], and child not being sick in the previous 2 weeks [OR 0.08 (95%CI: 0.007 - 0.788)] were protective factors from Anaemia.

*Conclusions:* There is a high prevalence of anaemia among children 6 to 59 months attending Banadir hospital in Mogadishu, Somalia. Factors independently associated with anaemia included: failure to provide exclusive breastfeeding, low maternal education, young maternal age, and sickness of the child in the preceding two weeks. To reduce anaemia in this setting, we should promote exclusive breastfeeding and educate females to at least secondary level in schools and above.

## 22. Pertussis outbreak investigation in Galkayo district, south Mudug region, Somalia, November, 2021

Mohammed Hassen<sup>31</sup>, Amelework Getinet Alene<sup>32</sup>, Steven Ssendagire<sup>33</sup>

*Background:* Pertussis is a highly contagious respiratory illness caused by Bordetella pertussis. It is one of the most common vaccine-preventable bacterial infections that affect all susceptible individuals, regardless of age. An investigation was undertaken to verify the existence of an outbreak and implement control measures in Galkayo district, south Mudug region.

*Methods:* Data were collected using a line list and a modified case investigation form. Health facility registers and line lists were reviewed, and a house-to-house case search was done to find additional cases. To identify cases, the following case definitions were adopted: A person with a cough lasting at least 2 weeks AND ONE or more of the following signs: Fits of coughing (paroxysms), making whooping sound when breathing in (inspiratory whooping) or vomiting immediately after coughing without other cause (post-tussive vomiting). Immunization coverage and vaccine-storage facilities were assessed. Data were entered and analyzed using Microsoft Excel.

*Results:* A total of 101 cases and no deaths were identified with an overall attack rate of 6 per 10000 population. The mean and median age of the cases was 2.5 and 1.4 years (ranged from 1 months to 8 years) respectively. The majority (87%) of the cases were unvaccinated. Among the total cases, 46 (45.5%) were females and cases were reported from four sections of Galkayo town (Garsoor 18, Hawlwadag 20, Horumar 34 and Wadajir 15) and 14 (14%) cases were identified from Harhaar IDP camps located on the outskirts of the city. A higher number of cases were reported from the last week of October to first week of November 2021.

*Conclusions:* A suspected outbreak of pertussis has occurred in Galkayo district and children under five years were more affected. Low vaccination coverage and a weak surveillance system are major factors

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<sup>32</sup> African Field Epidemiology Network, Somalia

<sup>33</sup> World Health Organization, Somalia

that contributed to the occurrence of the outbreak. The majority of cases and all deaths of the outbreak occurred before the zonal health office, district health office and cluster health center were alerted and response activities initiated. Routine immunization services and treatment of infected patients with appropriate antibiotics should be intensified. MOH-Galmudug and the implementing partners should establish and implement routine EPI service in Galkayo district.

### 23. Breastfeeding practice among Somali mothers in Kisenyi, Kampala district Uganda

Mohamed Mohamud Shobow<sup>34,35,36</sup>

*Background:* Breastfeeding is so important that it has the potential to save the lives of over 820,000 children under the age of five each year. Globally, approximately 44% of infants aged 0–6 months are exclusively breastfed. In Somalia, less than 10% of infants under 6-months of age are exclusively breastfed. The reasons were vigorous advertising of infant formulas and the persistence of inaccurate information.

*Objectives:* To identify the socio - demographic characteristics, knowledge and attitudes of Somali women in Kisenyi on different breastfeeding options.

*Methods:* This was a cross-sectional study with both quantitative and qualitative data collected using a questionnaire and key informant for a sample size of 287 Somali mothers with children under the age of 24 months. These were recruited using the purposive sampling technique. Key informant interviews were conducted with 10 experts, including medical doctors, nurse officers, and managers. The data was analyzed using SPSS.

*Results:* The quantitative study shows a significant relationship between number of children produced and the mother's level of income ( $X^2 = 12.955$ ;  $p = 0.011$ ). Although women are willing to breastfeed for two years, they have less knowledge towards breastfeeding as recommended by WHO. For example, the majority of Somali women in Kisenyi initiated breastfeeding 1 – 24 hours after birth. The reasons for not breastfeeding include (i) illness, (ii) pregnancy, (iii) insufficient breast milk, and (iv) lack of enough nutrients. Most of the women reported that they provided pre-lactating food/drinks like water to their babies. In addition, the qualitative results indicated that the existing health systems approaches were not promoting good breastfeeding practices among Somali mothers in Kisenyi.

*Conclusions:* Regarding attitude towards breastfeeding, Somali women in Kisenyi prefer the predominant breast-feeding options. However, there is a gap in the existing health system approaches towards promoting good breastfeeding practices.

### 24. Knowledge, attitudes and practice of female genital mutilation among women in reproductive age in MCH Hodan district in Mogadishu, Somalia

Fatima Ismail Mohamed<sup>37</sup>

*Background:* Female Genital Mutilation (FGM), also known as Female Genital Cutting (FGC) is by definition the removal of female genitalia partially or completely for non-medical purposes. The former term is widely used by World Health Organization (WHO). FGM is a long-held tradition in the society of Somalia. It is practiced for a variety of reasons including socio-cultural reasons, varying from one ethnic group and region to another but the primary reason is that it is part of the cultural tradition and history of the community. FGM predates Islam and is also performed in some Christian communities whilst it is not practiced at all in many Muslim countries.

*Methods:* The current researcher collected primary data using questionnaire and focus group discussions as a research instrument. Descriptive statistics were used. This study targeted a population

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<sup>36</sup> Lincoln University postgraduate

<sup>37</sup> Capital University, Mogadishu, Somalia

of 323 subjects and a sample size of 149. The shape of the questionnaire in the demographic section is looked upon in terms of age, marital status, level of education. Occupation analysis of data in this study was done concurrently with data collection. After collection of the data, the questionnaires of respondents were sorted out and their responses verified, coded, categorized and entered into the computer using Statistical Package for Social Sciences (SPSS) version 20.0 Software.

*Result:* This study found that all participants 149 (100.0%) have an insufficient or even low-level knowledge about FGM whereas 95(63.8%) respondents have neutral attitude and highly practice FGM. Interestingly, only 68 (45.6%) have shown positive attitude towards FGM and are likely to mutilate their daughters, while the 81(54.4%) were against the idea of mutilating their daughters. Indeed, the majority of respondents 97(65.1%) preferred that FGM practice should continue in the community, while only 52(34.9%) were against this practice in the community. The majority of respondents 103 (69.1%) did not try to intervene when FGM was being practiced, while only 46 (30.9%) are in favor of making an intervention against FGM.

*Conclusions:* The current study sheds light on the level of awareness of FGM in the community and thus recommends that the Government should conduct an awareness program for the community about FGM. The researcher recommends that the Minister of Health (MoH) may inform the community about health problems that FGM can cause. One of main reasons why FGM is carried out is to control women's sexuality, which is sometimes said to be insatiable if parts of the genitalia, especially the clitoris, are not removed. FGM is seen as part of a girl's initiation into womanhood and as an intrinsic part of a community's cultural heritage.

#### 4.3.3 Communicable Diseases

##### 25. Utilization of Long-Lasting Insecticide Nets (LLINs) among household members for protection against mosquito bites in Mogadishu districts

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*Background:* Understanding the Long-Lasting Insecticidal Nets (LLINs) utilization is important for monitoring and quantifying the impact of past and current malaria prevention and control efforts. This study examined the ownership, source, physical integrity, and use of LLIN, and assessed barriers to their use.

*Methods:* A cross-sectional study was conducted on a sample of 409 households in districts of Mogadishu, Somalia, between November 2020 and March 2021. A standardized questionnaire was used to collect data from the head of household on demographics, knowledge of malaria, ownership and source of LLINs and their use as a preventive measure. Use of LLINs was assessed using multivariable generalized estimating equations (GEE), taking into account the clustering of study participants within the same household. Data collectors also observed the physical integrity of LLINs by observing the available LLINs.

*Results:* Of the 409 households, only 155 (37.9%) owned LLINs. The respondents were predominantly female (87.3%). The median age of respondents was 30.0 years (interquartile range [IQR] = 15.0). About 25% had a primary education. Of the 237 who owned LLINs, 199 (84.0%) used them. Median household size was 6.0 (3.0), intra-household net accessibility was low, with one net (42.6%) ownership frequency per household. Most nets were from mass distribution (55.7%) 12 months ago. Unpartnered (widowed/divorced) female respondents (adjusted odds ratio [AOR] 0.227, 95% CI 0.067–0.776;

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p=0.018) compared with married, large-sized household (AOR 0.873, 96% CI 0.785–0.971; p=0.012), older nets of 25–48 months (AOR 0.099, 95% CI 0.021–0.460; p=0.003) were associated with marginal evidence of lower odds of LLIN use. Knowledge of malaria was associated with higher odds of LLIN use (AOR 4.937, 95% CI 1.603–15.21; p=0.005), indicating that lack of knowledge was a barrier to LLIN use.

*Conclusions:* LLIN ownership was low in the study community, affecting access and use. LLIN utilization was modest and was mainly driven by recently acquired nets, showing a desire to use them despite low coverage. Large household size, older nets, the poor physical integrity of the nets, lack of knowledge of malaria causes and preventive methods, unpartnered heads of households, and misconceptions of low susceptibility of the residents to the malaria infection were barriers to net use. Although mass and facility-based distributions, and social health education campaigns remain critical, efforts for willingness to pay for LLINs need to be strengthened to maintain coverage and replacement of worn-out nets.

## 26. Incidence of adverse drug reactions among patients on new MDR-TB treatment in Forlanini hospital, Mogadishu, Somalia

*Osman M. Abdulle*<sup>43</sup>

*Background:* Drug-resistant tuberculosis (DR-TB) has been an emerging public health threat to Somalia and the treatment is more complicated, more toxic, and expensive. This study aims to determine the incidence of adverse drug reactions (ADRs) associated with the new MDR-TB medicines.

*Methods:* This study was a retrospective, record-based, observational study. The data were collected from the medical records of DR-TB patients registered and enrolled on treatment from 1st January 2020 to 30th September 2020. A structured form was designed and utilized to collect the data that include variables on the ADR profile of diagnosed MDR-TB cases on new, shorter, and longer regimens.

*Results:* A total of 134 subjects were studied, out of which 90% were reported with ADRs. The majority of them suffered from gastrointestinal disorder (123, 91%), followed by neurological disorder (106, 79%) and psychiatric disorder (50, 37%). Other side effects (118, 88%) suffered include weight loss, body weakness, anemia, and others. Most ADRs were managed symptomatically, whereas others were managed by changing the antitubercular drug, use of vitamin B6, and use of antidepressants.

*Conclusions:* Early detection, management, and reporting of ADRs remain key factors in the management of MDR-TB with remarkable relevance to preventing the emerging threat of global MDR-TB.

## 27. Clinical Outcomes of 1,111 Patients with Multi-Drug Resistant Tuberculosis in Somalia

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*Background:* Multidrug-Resistant Tuberculosis (MDR-TB) is an emerging global health threat, where the treatment outcome remains poor in most settings. Somalia has one of the highest MDR-TB death rates in the world and no recent data on the treatment outcomes of patients treated for MDR-TB is established. This study aimed to determine the clinical outcomes and factors associated with poor treatment outcomes.

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<sup>48</sup> College of Health Sciences, Makerere University, Kampala, Uganda

<sup>49</sup> Gulu University, Gulu, Uganda

*Methods:* A retrospective cohort study was conducted at the Forlanini Hospital MDR-TB center in Mogadishu between 2015-2020. Eligible participants were individuals aged 18 years or older with microbiologically confirmed MDR-TB. We defined poor treatment outcome as a composite of lost to follow up (LTFU) or death. Multivariable logistic regression model was constructed to determine predictors of poor treatment outcomes.

*Results:* Data of 1,111 participants was analysed. Of this, 728 (66.7%) were female, with a median age of 25 (interquartile range: 20 - 33) years. The majority (n=999, 90.9%) had pulmonary TB and were on a treatment regimen consisting of amikacin/levofloxacin/cycloserin/ethionamide/ pyrazinamide (n=895, 82.6%). Eight (0.9%) were HIV-infected. Overall, poor outcomes were registered in 137 (12.3%) participants; 66 (5.9%) died and 71 (6.4%) were LTFU. Participants aged 26 years or older were 2.2-fold at a higher risk of having poor outcomes compared to those younger than 26 years of age (aOR: 2.2, p<0.0001). Also, HIV-infected individuals had a 5-fold higher risk of poor outcomes (aOR: 5.0, p=0.012), while females had nearly 2-fold higher odds of poor outcomes (aOR: 1.7, p=0.01). The treatment regimen bedaquiline/cycloserine/levofloxacin/clofazimine/linezolid was associated with an 80% reduction in the odds of having a poor outcome (OR: 0.2, p<0.0001).

*Conclusions:* Among the predominantly young and HIV-negative MDR-TB patients in Somalia, the newer MDR-TB regimen significantly led to a reduction in poor outcomes, meanwhile a disproportionate number of HIV-infected individuals, like women are at increased risk of poor outcomes.

## 28. Rifampicin Resistant Mycobacterium Tuberculosis Prevalence and Risk Factors in Children under the Age of Fifteen Years among MDR Patients Attended at the MDR-Centre in Mogadishu, Somalia: Retrospective Cross-Sectional Study

Mohamed Abdirahaman Omar<sup>50</sup>, Ahmed Yusuf Guled<sup>51</sup>

*Background:* MDR-TB is characterized as tuberculosis resistant to at least one of the two most powerful first-line anti-TB medications, isoniazid (INH) and rifampicin (RMP) (Paul 2001). Drug-resistant tuberculosis affects youngsters as well. Every year, it is predicted that around 30,000 children are infected with multidrug-resistant bacteria (MDR-TB). The primary goals of this study are to assess the prevalence and risk factors of Rifampicin Resistant Mycobacterium Tuberculosis in Children under Fifteen Years old among MDR Patients Attended at Mogadishu MDR Centre at Forlanini Hospital, Mogadishu, Somalia.

*Methods:* The study was a retrospective cross-sectional study, and the sample size was small. Consecutive sampling was used, and the sample size was all MDR children under the age of 15 who were registered throughout the research period. This study included all patients who were tested for MDR-TB from the start of Gene Xpert testing in December 2015 and June 2018. Data were analyzed using the Statistical Package for Social Sciences (SPSS) version 20.

*Results:* The following are the findings from this study: 540 MDR cases were treated in total throughout that period. 59 of them (10.9 %) were children under the age of 15 with rifampicin-resistant bacilli. The most common risk factors for Rifampicin resistance were: children with MDR case Contact (AOR=3.818 [CI 1.293-11.275]; p =0.01), previous history of TB treatment (AOR=1.896 [CI 1.650-2.528]; p =0.02), TB case contact (AOR=2.224 [CI 1.042-3.190]; p =0.04), 1 time TB episodes (AOR=3.973 [CI 1.638], Previous Treatment Outcome (Cat II Relapse) (AOR=2.234 [CI 1.750-2.653]; p =0.014), Duration of the First Course of TB Treatment (3-5 months (AOR=1.742 [CI 1.102-3.639]; p =0.036).

*Conclusions:* This study found the significant prevalence of risk factors for Rifampicin Resistant Mycobacterium Tuberculosis in children under the age of 15 years. Existing TB control methods must target such risk factors if MDR-TB development is to be greatly reduced. To avoid the spread of MDR-

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TB in the country, more thorough anti-TB drug delivery as well as more effective follow-up procedures are necessary.

### 29. Delay of TB patients' diagnosis in a conflict setting of Mogadishu, Somalia - a cross-sectional study

*Abdulwahab M. Salad*<sup>52</sup>

**Background:** The TB case detection rate in Somalia is 42%, which is much lower than the WHO target of detecting 70% of new TB cases. Understanding the factors contributing to the delay of TB patients in the diagnosis and reducing the time between the onset of TB symptoms to diagnosis, is a prerequisite to increase the case detection rate and to ultimately bring the TB epidemic in Somalia under control. The aim of this study is to examine the duration of delay, and factors associated with the delay among patients in TB management centers in Mogadishu, Somalia.

**Methods:** An institution-based, cross-sectional study was conducted in TB management clinics providing directly observed treatments (DOTS) programs in Mogadishu. A total of 276 patients were interviewed using a structured questionnaire from June-October 2018. We analyzed data using descriptive statistics and different logistic regression models.

**Results:** Approximately 78% of study participants were male. Nearly a third (36.5%) came from a household of nine individuals or more, while 73% were unemployed. The median patient and provider delays were 50 days and one day, respectively. The median total delay was 55 days, with an inter-quartile range of 119 days. Patients who had poor knowledge of the symptoms of TB had 3.16 times higher odds of delay over 50 days than their counterparts. Furthermore, higher odds of delay were associated with the poor knowledge of the symptoms of TB (aOR 4.22, CI 2.13-8.40); not making one's own decisions in seeking TB treatment (aOR 2.43, CI 1.22-4.86) and a poor understanding of the fact that TB can be treated with biomedical treatment, as opposed to traditional treatment (aOR 2.07, CI 1.02- 4.16), these being the predictors of patient delays over 120 days.

**Conclusions:** The duration in the delay of TB patients' diagnosis in Mogadishu is one of the highest reported in developing countries, exceeding two years in some patients. Training local community health workers to detect suspected TB cases and referring the cases of a prolonged cough over three weeks for TB care centers for diagnosis, is imperative to help break the transmission and reduce the infectious pool in the population of Mogadishu. This may not only increase the community awareness of TB disease, but it may also facilitate the early referral of TB patients to diagnostic and treatment care centers.

### 30. Magnetic resonance imaging findings of intracranial tuberculoma patients in tertiary hospital in Mogadishu, Somalia

*Ismail Gedi Ibrahim*<sup>53</sup>, *Mohamed Gedi Shikhow*<sup>54</sup>, *Eren MUTLU*<sup>53</sup>

**Background:** Tuberculosis (TB) is a fatal disease caused by *Mycobacterium tuberculosis* (M. tb), with over eight million annual mortalities reported worldwide, attributed to the disease's direct or indirect effects. Among the most severe form of M. tb is infection of the Central nervous system (CNS-TB). This infection is characterized by meningitis, tuberculoma, and tuberculous brain abscess. Tuberculomas are the most common variety of intracranial parenchymal tuberculosis. They occur because of conglomeration and conjugation of tubercular microgranulomas, that tend to occur at the grey-white matter junction due to arrest of the haematogenously disseminating microbes caused by decrease in the calibre of vessels in that region.

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<sup>54</sup> Somaville university, Mogadishu Somalia

**Objectives:** The purpose of this study was to evaluate the findings of the MRI scan of patients with intracranial tuberculoma using retrospective analysis of hospital records.

**Methods:** We conducted a retrospective data analysis of 73 patients who were diagnosed with intracranial tuberculoma using imaging features at the Radiology Department, Somali-Turkey Recep Tayyip Erdogan hospital. All the patients' magnetic resonance imaging (MRI) was evaluated, including conventional and contrast sequences, as well as MR diffusion.

**Results:** The findings of this study, revealed that the majority of tuberculoma patients 43 (58.9%) were female, while 30 (41.1%) were male. Based on the distribution of the conglomerate's tubercles, 39 (53.4%) were located in the supra-tentorial region, while 24 (32.9%) were found in both the supra-tentorial and infra-tentorial regions, with 10 (13.7%), residing in the infratentorial region. This study also discovered that the majority of the tuberculoma patients 43 (58.9%) had multi-focal lesions, with 30 (41.1%) having single lesions. Also, associated abnormalities were detected in 28 (38.4%) of the patients with meningitis, while 7 (9.6%) had both hydrocephalus and meningitis, and 2 (2.7%) had hydrocephalus, and one patient had cerebral infarction.

**Conclusions:** The outcome of this investigation showed that MRI is a suitable diagnostic tool for the identification of intracranial tuberculoma and associated abnormalities.

### 31. Determinant factors for the occurrence of Tuberculosis among people living with HIV after ART initiation in selected public hospital in Mogadishu-Somalia 2020 - case control studies

*Abdulkadir Mohamed Ahmed Keynan*<sup>55</sup>

**Background:** Tuberculosis is a major cause of death among HIV/AIDS patients. The risk of contracting tuberculosis in people living with HIV is believed to be 20-37 times higher than in people who have never been infected with HIV. Many patients in the developing world either have a history of tuberculosis when they initiate antiretroviral medication or develop TB while on it. As the CD4 count rises, ART reduces the risk of TB, but the increased risk of TB never goes away, even if CD4 levels return to normal.

**Objective:** To assess determinant factors for the occurrence of TB among people living with human immunodeficiency virus (PLWHIV) after ART initiation in public hospitals Mogadishu, Somalia 2020.

**Methods:** From July to December 2020, case-control research was undertaken in two public hospitals in Mogadishu, Somalia. The study's sample size was 75 people (25 cases and 50 controls). Adults living with HIV who developed tuberculosis after starting antiretroviral therapy and were on anti TB treatment in the six months prior to data collection were considered cases. Adults living with HIV who did not acquire tuberculosis after starting antiretroviral therapy (ART) served as controls. The data was gathered using an interviewer-administered structured questionnaire. To evaluate independent factors of TB among people living with HIV after ART beginning, researchers used bivariate and multivariate analysis with logistic regression.

**Result:** After adjustment for potential confounders, the presence of Isoniazid (INH) prophylaxis (AOR=.036,203; 95% CI: 0.03,0.45; P=0.03) had an independent protective benefit against risk of tuberculosis. Study subjects with baseline WHO clinical stage III or IV (AOR=1.35,323; 95% CI: 0.12,1.60), as well individuals with hemoglobin level <10mg/dl (AOR=(.042, 292; 95% CI: 1.02,9.07) were independent predictors for increased risk of tuberculosis in people living with HIV after ART initiation.

**Conclusions:** Increasing INH preventive therapy coverage lowered the overall risk of tuberculosis in HIV patients who began treatment. Patients with an advanced disease (WHO clinical stage III or IV disease, hemoglobin level less than 10mg/dl) should be given additional attention to prevent the risk of new TB infection. It is also suggested that housing conditions and living standards be improved.

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### 32. Assessment of non-adherence to anti-TB drugs and associated factors among TB patients attending TB centers during COVID-19 pandemic in Mogadishu, Somalia

Abdullahi Abdirahman Omar<sup>56</sup>, Mariam Abdi Hassan<sup>56</sup>

*Background:* Tuberculosis continues to be a public health challenge around the world. Non-adherence to tuberculosis treatment is the main barrier of the tuberculosis treatments success rate for prevention and control of tuberculosis. Poor adherence to tuberculosis treatment may result in infectious diseases persisting, through drug resistance, (and in relapse and death.)

*Objectives:* The aim of this study was to assess the level of non-adherence rate and factors that influence non-adherence to anti-tuberculosis medication among tuberculosis patients attending selected TB centers in Mogadishu during the first wave of COVID-19 in 2020.

*Methods:* An analytic cross-sectional study design was adopted for this study. The study was conducted among 255 tuberculosis patients from three selected tuberculosis centers located in Mogadishu. The period of study was from 15 April up to 15 July in 2020. All the study subjects were interviewed with a structured standard questionnaire. The 8-item of Morisky Medication Adherence Scale was used to measure adherence to anti-tuberculosis medication. The primary data were organized, entered and analyzed in SPSS. The analysis of descriptive statistics and logistics regression were carried out in this study by using frequency, percent, odds ratio, confidence interval, chi square test, and p-value represented as tables and figures.

*Results:* The prevalence of non-adherence towards anti-tuberculosis medication was 34.5%. The binary logistic regression analysis demonstrated statistically significant associations with non-adherence towards anti-tuberculosis treatment. The factors significantly associated with non-adherence to treatment were sex of the tuberculosis patients (X<sup>2</sup> 5.377, P-value= 0.020\*), age of tuberculosis patients (X<sup>2</sup> 8.274, P-value= 0.041\*), smoking habit of patients that had tuberculosis (OR= 1; 95% CI: 0.049-0.246), tobacco using habit of tuberculosis patients (OR= 0.074; 95% CI: 0.024-0.222), khat chewing habit of tuberculosis patients (OR= 0.081; 95% CI: 0.081-0.387), poor knowledge of tuberculosis and its treatment (OR= 1.876; 95% CI: 1.249-2.917), and continuation phase of anti-tuberculosis treatment (OR= 2.7; 95% CI: 1.544-4.718). The major reasons of the study participants for interruption of taking anti-TB medications were forgetting 29 (33%), feeling well 26 (29%), missing treatment due to the side-effects 16 (18%), and 14 (16%) were missed due to experiences and fear of COVID 19.

*Conclusions:* The proportion of anti-tuberculosis treatment non-adherence rate in tuberculosis patients was higher in Mogadishu, capital of Somalia through the first wave of COVID-19. This study pointed out the main significant barriers and associated factors of anti-tuberculosis treatment adherence, especially in COVID-19 period. Interventions of patient centered development and promoting strategies of adherence at the pandemic time are strongly essential.

### 33. Prevalence of COVID-19 Vaccination Acceptance and Its Associated Factors Among Elderly People [>60 Years] Living in Benadir Region, Southeastern Somalia

Abdiweli Mohamed Abdi<sup>57</sup>, Ahmed Abdulkadir Khalif<sup>58</sup>

*Background:* Desire or hesitation to take a COVID-19 vaccine have a significant public health role since they can actually be determinants of transmission, morbidity, mortality, increased or decreased cases of the disease among vulnerable elderly people living in a country with limited and fragile health care services. This study investigated the prevalence of COVID-19 vaccine acceptance and those factors associated with its acceptance or hesitancy among elderly people.

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<sup>57</sup> Modern University for Science and Technology

<sup>58</sup> Ministry of Health, Mogadishu, Somalia

*Methods:* A descriptive cross-sectional community-based study design using a quantitative approach through questionnaires administered by interviewers was carried out among 427 participants in Benadir region, Southeastern Somalia, from September 1 to October 15, 2021. A quota based non-probability sampling technique was used to include participants from all seventeen districts in the region and enhance the representativeness of the study results. 10 trained and qualified data collectors participated in the data collection process. To assess factors associated with COVID-19 vaccination acceptance, a multivariate logistic regression model was employed. Statistically a P-value of <0.05 was thought to suggest significance of association.

*Result:* Overall, among the 427 participants of the study, a total of 172 (40.3%) participants were either already vaccinated 45 (10.5%) or had a desire to take the vaccine in the future 127 (29.7%). The main reasons that convinced most of them to take the vaccine were due to their old age (32.8%), fast spreading nature of the disease (27%) and fatality of the disease (16.1%). The main reasons presented among the 255 (59.8%) respondents who hesitated to take the vaccine were lack of adequate information (36.9%), safety concerns (23.1%) and reasons related to religion (14.1%). Furthermore, participant's acceptance of COVID-19 vaccination was associated significantly with having a close friend who died of COVID-19 (OR = 3.960; 95% CI = 2.171- 7.226), educational status (OR = 0.101; 95% CI = 0.033- 0.309) or having heard about the COVID-19 vaccine (OR = 0.160; 95% CI = 0.084- 0.307).

*Conclusions:* The results of the study showed that the prevalence of COVID-19 vaccination acceptance among elderly people living in Benadir Region, Southeastern Somalia is low, therefore the federal Ministry of Health, member states and regional ministries and authorities of health, the media, the religious leaders and all other concerned international and local organizations should co-operate and create an increased level of awareness about the lack of adequate information, safety concerns, religious misconceptions and promote the need to take the vaccine.

#### 34. Perceived stress, anxiety and depression and its associated factors during covid 19 pandemic among healthcare workers in COVID 19 health facilities in mogadishu somalia

Abdirazak Yusuf Ahmed<sup>59</sup>, Ikram Adam Aburrahman<sup>59</sup>, Mustafa Yusuf Ahmed<sup>59</sup>

*Background:* Coronavirus disease 2019 (abbreviated "COVID-19") is an emerging respiratory disease that is caused by a novel coronavirus and was first detected in December 2019 in Wuhan, China. The rapid spread of the disease created challenges for healthcare systems and forced healthcare workers to grapple with clinical and nonclinical stressors, including shortages of personal protective equipment, mortality and morbidity associated with COVID-19, fear of bringing the virus home to family members, and the reality of losing colleagues to the disease.

*Objective:* The COVID-19 pandemic health challenge has cried out for finding-out the perceived anxiety, depression, stress as well as their associated factors among healthcare workers in COVID-19 health facilities in Mogadishu Somalia.

*Methods:* The study was cross-sectional, descriptive analysis was used, involving all healthcare workers in COVID-19 health facilities in Mogadishu, more specifically Demartino hospital, Benadir hospital and Dr Summait hospital. The calculated sample size was 168 using the Slovin formula. Since the target population was known from the staff registration book, candidates were selected through systematic random sampling from each hospital in accordance with their proportion in the total population.

*Results:* Anxiety was perceived mostly among respondents since only 30.7% were at a normal level, however only 10.7% had severe anxiety. Stress on the other hand, was perceived the least since only 84.8% of participants were normal. Female participants were much more likely to have anxiety and stress. The level of perceived anxiety, depression or stress also varied depending on which department the respondent worked in. Participants working in the ICU and emergency were the most likely to have anxiety or stress compared to others.

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*Conclusions:* Perceived anxiety was the highest while only 1.1% of respondents had severe stress. Being of the female gender as well as department of work was significantly associated with the level of anxiety and stress while average income, motivation and living conditions were associated with depression. COVID-19 pandemic has profoundly affected the health care workers' mental wellbeing. Therefore it is imperative to ensure they receive the necessary support and motivation, as well as the protection they deserve for optimal healthcare delivery.

### 35. Knowledge, attitude and practice (KAP) towards COVID-19 among faculty of Health Sciences students at Mogadishu University

*Walid Abdulkadir Osman*<sup>60</sup>

*Background:* Up until June 23, 2020, 2,416 cases are registered and 85 deaths, with the majority of these deaths falling between the ages of 60 to 70. The country's authorities have applied necessary measures to prevent mass spreading of the virus. The aim of this study is to assess knowledge of, attitudes towards, and practices against (KAP) COVID-19 among Faculty of Health Sciences students at Mogadishu University.

*Methods:* A cross-sectional study was carried out on April 11, 2020, two weeks after the closure of schools and universities in Mogadishu to June 28, 2020. A total of two hundred and fifty-eight subjects was randomly selected to give their responses. The survey was conducted online using a KoBo Toolbox form distributed through "WhatsApp" groups. Health Sciences Students at Mogadishu University, who were explained the objectives and purpose of the study, who also agreed to participate in the study, were asked to complete the questionnaire by clicking on the link. A t-test based approach was used to determine the variance of students' responses according to their age, gender and academic year. The major limitation of the present study is that the sample sizes are limited to the students of Health Sciences Faculty at Mogadishu University, and hence the results based on the used sample sizes could not be generalized to all the populations of Mogadishu and Somalia as well. Although it can certainly help the state and the country to enhance the awareness regarding KAP in the general population. Due to the questionnaire being self-answered by the participants, there is also a high chance of errors or misrepresentation of information. Less demographic variables are also a limitation.

*Results:* 60.5% of them were 21–23 years old, 70.5% were females; and 31.8% were in academic year four. Most of the respondents reported that COVID-19 is a virus infection (93.8%), COVID-19 is transmitted by close contact with the infected person (80.2%), and the main clinical symptoms of COVID-19 are fever, fatigue, dry cough, and myalgia (84.1%). The majority of the respondents agreed that if infected with COVID-19, they will accept isolation in health facilities (61.2%). 83.7% agreed that wearing a well-fitting face mask is effective in preventing COVID-19, and COVID-19 will finally be successfully controlled (61.6%). The vast majority of the participants have worn a mask when in contact with people or leaving home (55.8%), frequently washed hands with soap or sanitizer (72.5%), had not visited any crowded place (40.3%), and sneezed between elbows (54.7%).

*Conclusions:* The knowledge about COVID-19 in the Faculty of Health Sciences Students of Mogadishu University during the outbreak was acceptable, attitudes have been mostly favorable, and the practices are mostly adequate. However, it is necessary to implement massive education campaigns in order to increase the proliferation of knowledge about COVID-19, to stop its spread.

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<sup>60</sup> Mogadishu University, Mogadishu, Somalia

### 36. Level of knowledge on health care workers toward prevention of hepatitis B infection in Ex-Digfer and Abu-Bashir hospitals in Mogadishu, Somalia.

Ahmed Sheikh Ali Ahmed<sup>61</sup>

*Background:* Health care workers are constantly exposed to the dangers of acquiring hepatitis B due to contact with the blood and body secretions of patients. (al., 2012) It's also a well-known fact that an unvaccinated person has a 6% to 30% chance of contracting the infection after coming into contact with HBV-infected blood or body fluids. (Perl1, 2011) HBV infection poses a grave public health problem worldwide, with over 2 billion people infected. An estimated 387 million people are infected with chronic HBV, with around 10 million new carriers every year. (al, 2009)

*Objective:* The main purpose of this study was to assess the level of knowledge of health care workers towards the prevention of hepatitis B infection in two hospitals in Mogadishu-Somalia.

*Methods:* We conducted a cross-sectional study involving all health care workers at Abu-Bashir voluntary and Digfer hospitals in Mogadishu, Somalia. The target population of this study was 398 persons including doctors, nurses, laboratory technicians, and cleaning staff. A sample of 199 participants was purposely selected from both hospitals. The study was collected via questionnaire and analyzed with SPSS.

*Results:* The majority of the respondents 130 (65.3%) were male. The study findings show that a fairly high proportion of health care workers (HCWs) (78.6%) had adequate knowledge about HBV. The vast majority of the HCWs (97.9%) had heard about Hepatitis B diseases and 97.7% knew that it was caused by a virus. The attitudes of the majority (59.8%) of the HCW towards hepatitis B vaccination were positive. Although vaccination is an important step in preventing HBV infection in health care workers, this study found that only 18.6% of the target HCWs had received the hepatitis B vaccine.

*Conclusions:* The study shows that only a small number of HCW in the study hospitals had received vaccination, indicating a low level of knowledge about the importance of the Hepatitis B vaccine among Somali HCWs. Given the HCW's risk of contracting HBV, we suggest mass Hepatitis B immunization among HCWs in the study sites.

### 37. Uptake of hepatitis B vaccination among healthcare workers in selected hospitals, Mogadishu, Somalia

Abdirazaq Ali Yusuf<sup>62</sup>, Abdulwahab M. Salad<sup>62</sup>, Roble Abdullhi<sup>62</sup>, Abdiiaziz Mohamed<sup>62</sup>

*Background:* Hepatitis B vaccination (HBV) is the most effective preventive method for hepatitis B virus infection. It is a major public health problem in Somalia, and health care workers (HCWs) are at increased risk. This study determined the uptake of hepatitis B vaccination among health care workers (HCWs) in selected hospitals in Mogadishu, Somalia.

*Methods:* A hospital-based cross-sectional study was conducted between July and August, 2020 using self-administered structured questionnaires among 278 HCWs in Benadir, Yerdemelli and Jazeera Specialist hospitals, Mogadishu, Somalia. Data was analyzed using SPSS version 22. Descriptive analysis was used to determine the uptake of vaccination. Ethical clearance was obtained from the Somali National University School of Public Health Ethics Review Board.

*Results:* Out of the 278 HCWs included in this study, 38.2 % received full course vaccination against HBV. The most frequently mentioned reasons for not being vaccinated against HBV are unavailability of the vaccine (76.7%) and its cost (19%). In this study, more than half (69.7%) of health care workers were knowledgeable about HBV. Two of the study hospitals did not have HBV advocacy mechanisms in place.

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<sup>62</sup> Somali National University

*Conclusions:* HBV coverage among HCW in Benadir, Yermdemelli and Jazeera Specialist Hospitals is inadequate. This mostly due to unavailability of the vaccine and its cost. We recommend making the vaccine available and accessible.

### 38. Assessment of Hepatitis B Vaccination Status and Associated Factors among Health Workers in Bosaso, Puntland, Somalia

*Nur Ahmed Hussein<sup>63</sup>, Saaid Said Jama<sup>63</sup>, Abdiwahid Mohamed Ismail<sup>63</sup>*

*Background:* Hepatitis B virus (HBV) is a major cause of both acute and chronic liver disease leading to cirrhosis and hepatocellular carcinoma. According to the 2019 World Health Organization (WHO) estimate, two billion people worldwide have serologic evidence of past or present HBV infection. The risk of infection is particularly high among health professionals due to the greater risk of contact with fluids of infected patients and needle stick injuries. This study aimed at assessing HBV vaccination coverage and the reasons for not receiving HBV vaccination among health care workers (HCWs) in Bosaso.

*Methods:* This was a community-based cross-sectional study conducted by using a quantitative survey research carried out from September 2020 to November 2020 among the HCWs working in Bosaso city health facilities. The study targeted all the 283 HCWs operating, and not on leave, during the study period, in all the public and private healthcare facilities. This included 5 hospitals, 8 MCHs and 19 Clinics that had direct contact with patients and their blood and body fluids encompassing doctors, nurses, midwives, dentists, and laboratory workers. All the HCWs of both shifts and day workers were informed about the study aim and 242 agreed to be interviewed using a self-administered questionnaire after obtaining the ethical clearance and securing their consent, while the remaining 41 HCWs declined to participate. The SPSS software package (version 20) was used for the data analysis.

*Results:* 232 of the HCWs successfully revealed their HBV vaccination status, and of those, 16.4% were reportedly fully vaccinated with three doses, whereas 4.3% and 3.4% stated to have received one and two doses, respectively, and the remaining 75.9% were totally unvaccinated. The main reasons for not receiving the vaccine were its unavailability (42%), high vaccine cost (28.7%), lack of time (20.7%), and fear of vaccine side effects (7.5%). The majority (69.7%) of HCWs demonstrated good knowledge about HBV infection. The vaccination uptake was significantly higher among midwives in relation to other health professionals ( $p=0.02$ ;  $OR=1.21$ ;  $95\%CI=1.39-67.41$ ) and individuals aged under 30 years ( $p=0.03$ ;  $OR=8.6$ ;  $95\%CI=1.17 - 63.26$ ).

*Conclusions:* Our study revealed that the HBV vaccination coverage of the HCWs in Bosaso was very low owing to vaccine unavailability, its high cost, lack of time and fear of side effects. We therefore stress the need for a well-regulated strategy with sufficient funding and effective implementation within both the public and private health sectors. We also recommend a state level and national level assessment of the seroprevalence of HBV among the HCWs to generate the necessary evidence to plan the implementation of an efficient and free immunization program for the HCWs who are perpetually at risk for HBV infection.

### 39. Prevalence of urinary tract infection among pregnant women attending antenatal care clinics in Benadir hospital, Mogadishu, Somalia

*Yahye Sheikh Abdulle<sup>64</sup>*

*Background:* Urinary tract infection (UTI) is a common infection in women, and it is more likely to occur during pregnancy due to mechanical and hormonal changes in pregnant women. UTIs can cause many complications for both mother and fetus.

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*Objective:* The objective of the study was to assess the prevalence of UTI among pregnant women attending ANC clinics.

*Methods:* A descriptive cross-sectional study was conducted among pregnant women who attended ANC Benadir hospital, Mogadishu, Somalia, from April to May 2021. A total of 154 pregnant women participated in this study. A purposive nonprobability sampling technique was employed to select samples from the population. Structured questionnaires were distributed among participants. A urine sample was taken using a rapid dip stick and the data was analyzed using SPSS version (20.0).

*Result:* Most of participants 110 (71.4%) were 21-35. The prevalence of UTI among pregnant women was 121(78.6%). The prevalence was high in the 21-35 years age group, with 91 of the 110 showing symptoms (75.2%). There was also a high prevalence among illiterate individuals, (61.2%). 101 participants (83.4%) had a history of UTI. According to the parity, (81%) of participants were multipara. Lastly, prevalence of UTI was also high among those in the 3<sup>rd</sup> trimester of their pregnancy (46.2%).

*Conclusions:* The prevalence of UTI among pregnant women was high. Based on the findings, the prevalence of infection was high among women who were illiterate, had a previous history of UTI, multipara, and in their 3rd trimester. Therefore, the study recommends raising awareness among pregnant women with regular antenatal care in reducing the prevalence of the infection.

#### 40. Study of bacterial contamination on mobile phones among healthcare professionals in Wardi Community Hospital

Adam Sharif Abdulkadir Abdirahman<sup>65</sup>

*Background:* Mobile phones spread infections and constitute a health danger to health staff, patients, and their families. It is known that 80% of infections are spread through hand contact. However, bacterial contamination of mobile phones used by health care workers and their potential for spreading infections has not been studied yet in Somalia.

*Objectives:* To determine the frequency of use of mobile phone devices, common bacterial pathogens, determining the level of bacterial contamination and sanitation practice among health professionals.

*Methods:* This was a cross-sectional study, using a self-administered questionnaire and samples collected, using Petri Dish plates, from mobile phones owned by healthcare workers at Wardi Hospital. We used a cotton swab moistened with sterile normal saline for an area of 3 cm<sup>2</sup> of mobile phone or its cover. The swab was placed in 1 ml sterile normal saline tube to maintain the viability of microorganisms. We conducted Bacterial Count, Culture and Identification. A 0.1 ml of the suspension was aseptically pipetted and transferred onto pre-labeled Nutrient Agar (HiMedia, India). Colonies were counted after 48 hours of incubation at 37 °C and expressed as a colony-forming unit per milliliter (CFU/ml) of the sample analyzed. A loopful of the suspension was streaked on Blood Agar and MacConkey Agar. The inoculated plates were incubated at 37±0.50C for 48 hours, after which their cultural characteristics were observed and recorded. Isolates from Blood and MacConkey Agar were sub-cultured to obtain pure isolates. The isolates were then identified by morphology and characteristic growth, gram stain, and pattern of biochemical profile (catalase, oxidase, coagulase,) in accordance with the standard methods.

*Result:* A total of 52 bacterial isolates were identified from mobile phones of health workers. They comprised of Gram-positive (65%) and Gram-negative bacteria (35%). Among the Gram-negative bacteria isolates, Pseudomonas species and non-coliform bacteria constituted close to 77% while 23% were coliforms bacteria. Of the 34 Gram positive bacteria isolates, the most frequently encountered were Staphylococcus aureus (29%) and coagulase negative Staphylococcus (CoNs) representing 23% of Gram-positive bacteria isolates. This was followed by Micrococcus species with 12% while 9% was Bacillus species.

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Conclusions: There is a high contamination rate of mobile phones by health workers. Therefore, strategies for preventing transmission of pathogens through mobile phones, such as hand washing and routine practices to clean mobile phones are recommended.

#### 41. Antimicrobial susceptibility of *Escherichia coli* isolates from diabetic patients in Mogadishu, Somalia

*Shafie Abdulkadir Hassan*<sup>66</sup>, *Yousif Mousa Alobaid Ahmed*<sup>67</sup>, *Bashiru Garba*<sup>68</sup>

*Background:* The most common organism causing urinary tract infections in diabetic patients is *Escherichia coli*, which is also one of the most common antibiotic resistant bacteria in humans. Diabetic patients are more likely to develop urinary tract infections due to frequent urination and high blood sugar levels. The aim of this study was to determine the antimicrobial susceptibility of *Escherichia coli* isolated from diabetic patients in Mogadishu, Somalia

*Methods:* This is a descriptive cross-sectional study conducted at Ummah Hospital, Mogadishu, Somalia, from November 2020 to April 2021. Urine samples were taken from diabetic patients attending at or admitted to the hospital with a target sample size of 350 participants. All samples were cultured in Cystine-Lactose-Electrolyte-Deficient (CLED) Agar, media (Himedia, India). Biochemical tests were performed to identify the isolated organisms. Kirby-Bauer disc diffusion was used to determine antibiotic susceptibility.

*Results:* Of the total 350 urine samples, *E. coli* was isolated in 220 (63%). All isolates were found to be resistant to cefpodoxime (100%). In addition, high resistance rates were observed with ofloxacin (90.8%), ciprofloxacin (77.5%), amikacin (60.8%), ceftriaxone (58.3%) and cefepime (51.7%). The most sensitive antibiotics were colistin and imipenem (99.2% and 88.3% respectively) followed by gentamycin (70%).

*Conclusions:* The results of this study show high rates of antimicrobial resistance to ofloxacin, ciprofloxacin, amikacin, ceftriaxone and cefepime. Colistin, imipenem and gentamycin are considered suitable for empirical treatment of *E. coli* in the study area. Continuous antimicrobial susceptibility monitoring in both community and hospital settings is recommended.

#### 42. Nosocomial infection control among health workers at Banadir and Shaafi hospital in Mogadishu, Somalia

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*Background:* Nosocomial infections, also called “hospital-acquired infections” (HAIs), are defined by the World Health Organization (WHO) as “infections acquired during hospital care, which are not present or incubating at admission and occurring more than 48 hours after admission”. This study was carried out on health workers at Banadir and Shaafi hospitals in Mogadishu aimed at assessing the healthcare workers' compliance with infection prevention and control (IPC) measures of hand washing techniques, sterilization procedures and adherence to the use of personal protective equipment (PPE) for the control of nosocomial infections.

*Methods:* This was a descriptive, cross-sectional study that employed qualitative and quantitative methods, conducted from February 2020 to August 2020. Participants included doctors, nurses, health care assistants and laboratory technicians. A sample was picked randomly from the listed staff. The questionnaire was pretested and collected for a total sample size of 162 with ages between 18-45 years.

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Key informant interviews for qualitative questionnaires were also used to collect data for which six collectors were trained on the requisite tools and study procedure. The data was analyzed using SPSS.

*Results:* In regards to hand sanitation, the overwhelming majority, 154 respondents (95.1%), stated using antimicrobials while 8 (4.9%) did not. Nearly two-thirds, 105 (64.8%) of the respondents, used iodine as an antiseptic, followed by chlorine used by 41 (25.3%) while 16 (9.9%) used other antiseptics. Moreover 147 (90.7%) out of 162 were also using alcohol hand rubs for additional protection. Concerning the use of PPE, most of the respondents 115 (71%) discarded gloves after contact with body fluids, while 45 (27.8%) sometimes discarded gloves while 2 (1.2%) never discarded gloves after contact with body fluids. Roughly two-thirds 107 (66%) of the respondents routinely used disposable rubber bands mask followed by 38 (23.5%) who routinely used other disposables face masks, while 17 (10.5%) reused washable masks. Regarding sterilization, the vast majority 149 (92%) used the heat sterilization process, while 13 (8%) did not. Furthermore 86 respondents (53.1%) stated that light radiation was also used in their hospitals. Based on the qualitative findings on training towards infection control for health workers, the majority of the respondents indicated that *“they availed in-service opportunities to enhance infection control knowledge and practice”*. The rest of the respondents indicated that regular training programs were formally planned for health workers although occasionally conducted for the staff”.

*Conclusions:* The study revealed incomplete health workers’ compliance with available IPC measures. To reduce the incidence of HAIs, the development of IPC guidelines with effective low-cost strategies for their implementation was necessary, backed by adequate staff training and managerial support for surveillance and control. These efforts will protect patients and healthcare workers alike and build a more resilient health system.

#### 4.3.4 Non-communicable diseases

### 43. Patterns of Limb Amputations at a Selected Hospital in Mogadishu, Somalia: A retrospective study

Mohamed Awale<sup>70,71</sup>, Ayan Muse<sup>71,72</sup>, Bashiru Garba Bvat<sup>71,72</sup>

*Background:* Limb loss is a potentially devastating event in a person's life, often resulting in physical and psychologic consequences. In Somalia, limb loss is frequently attributed to outcomes of the civil war since 1990. Victims are usually seen with amputated limbs or young men with two crutches and prosthetic legs. However, there is no report in Somalia related to limb amputation. The study examined the causes, age, gender and geographical characteristics of the patients.

*Methods:* This is a retrospective study using hospital registries covering all patients who underwent limb amputation at International Hospital Mogadishu between November 16, 2016 and December 31, 2017. Information on the causes of amputation, sociodemographic characteristics, including patient age, gender, and place of residence, and outcomes were extracted from the registers and patient files.

*Results:* Twenty-four patients underwent limb amputation, with an age group between 55 to 100 years old. Also, the rate of amputation between females and males were equal. The leading cause of limb amputation was diabetes, accounting for 75% (n=18). Other causes were arterial occlusive diseases (n=3; 12.5%), trauma such as bomb explosion or gunshot wounds (GSW) (n=2; 8.3%) and one case of osteosarcoma (4.2%). Twenty-two cases were of lower limb (92.7%) amputations and two cases (8.3%) were upper limb amputation (associated with trauma and Rhabdomyosarcoma). Of the lower limb amputations (n=22), 14 (63.6%) were below the knee, four cases (18.2%) were above the knee, two (9.1%) were metatarsal amputation and two (9.1%) cases were great toe amputation. Of the 18 diabetic amputees, ten (55.6%) cases reported to engage in cigarette smoking, five (27.8%) were obese, and the remaining three cases were free from smoking and obesity. All the diabetic cases had an uncontrolled

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blood sugar level. Geographically, majority of the amputees were from Benadir region (n=19; 79.2%), two (8.3%) from Southwest, one (4.2%) from Jubaland, one (4.2%) from Galmudug and one (4.2%) Hirshabelle respectively. With respect to the outcome of the cases, eight (33.3%) healed spontaneously after two dressings, nine (37.5%) cases were followed up to one month and healed after long dressing and re-stitches, three (12.5%) cases needed re-amputation and healed after longtime of dressing debridemen. One case (4.2%) was lost to follow up, and three individuals (12.5%) died during the study.

*Conclusions:* Diabetes was the leading (75%) cause of limb amputations, and lower limb amputations were the most frequent. Appropriate diabetes management and foot care are critical to prevent foot ulcers and its consequences.

#### 44. Cardiovascular Risk Factors and Clinical Outcomes of Patients Hospitalized with COVID-19 Pneumonia in Somalia

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*Background:* Coronavirus-2019 (COVID-19) pneumonia is a potentially life-threatening illness with no established treatment. Cardiovascular risk factors (CRF) exacerbate COVID-19 morbidity and mortality.

*Objective:* To determine the prevalence of CRF and clinical outcomes of patients hospitalized with COVID-19 pneumonia in a tertiary hospital in Somalia.

*Methods:* We reviewed the medical records of patients aged 18 year or older with a real-time reverse transcription-polymerase chain reaction (RT-PCR) confirmed COVID-19 pneumonia hospitalized at the De Martino Hospital in Mogadishu, Somalia, between March and July 2020.

*Results:* Medical records of 230 patients were reviewed; 159 (69.1%) males where the median age was 56 (41 – 66) years. In-hospital mortality was 19.6% (n=45), 77.8% in the ICU compared to 22.2%, in the general wards (p<0.001). Age ≥40 years (OR: 3.6, 95% CI: 1.2 – 10.6, p=0.020), chronic heart disease (OR: 9.3, 95% CI: 2.2 – 38.9, p=0.002) and diabetes (OR: 3.2, 95% CI: 1.6 – 6.2, p<0.001) were associated with mortality. Forty-three (18.7%) patients required ICU admission. Age ≥40 years (OR: 7.5, 95% CI: 1.7 – 32.1, p=0.007), diabetes (OR: 3.2, 95% CI: 1.6 – 6.3, p<0.001) and hypertension (OR: 2.5, 95% CI: 1.2 – 5.2, p=0.014) were associated with ICU admission. For every additional CRF, the odds of admission into the ICU increased three-fold (OR: 2.7, 95% CI: 1.2 – 5.2, p<0.001) whilst the odds of dying increased two-fold (OR: 2.1, 95% CI: 1.3 – 3.2, p<0.001).

*Conclusions:* We report a very high prevalence of CRF among patients hospitalized with COVID-19 pneumonia in Somalia. Mortality rates were unacceptably high, particularly among those with advanced age, underlying chronic heart disease and diabetes.

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#### 45. Knowledge, Attitudes, and Practices Concerning Breast Cancer, Cervical Cancer, and Screening Among Healthcare Professionals and Students in Mogadishu, Somalia

Mohamed Abdullahi Awale MD<sup>838485</sup>, Lucas Walz<sup>86</sup>, Kaveh Khoshnood<sup>86</sup>, Deqa Mohamed<sup>85</sup>

*Background:* Somalia faces exceptionally high incidence and mortality rates from both breast and cervical cancer. The age-standardized breast cancer incidence rate in Somalia is 41.7 per 100,000 women while the age-standardized breast cancer mortality rate is 29.1 per 100,000 women, the highest in all of Africa. After breast cancer, the second highest cancer among Somali women is cervical cancer. Given the high incidence and mortality of the two cancer types among Somali women, it is critical to identify factors that may influence healthcare workers' management of both cancers. At present, there is no consensus regarding providers' knowledge of different cancers and screening.

*Methods:* A cross-sectional questionnaire was administered to 469 healthcare professionals and medical students and was completed by 405 respondents (86%). We used a purposive sampling strategy for the recruitment. Healthcare workers and medical students were recruited from Mogadishu-based hospitals.

*Results:* 197 healthcare professionals and 207 students completed the survey and were included in the analysis. 89% and 73% of respondents demonstrated good knowledge of breast and cervical cancer, respectively. Only 46% knew that a vaccine could prevent cervical cancer, and 89% of healthcare professionals disagreed that HPV vaccines were available to their patients. Attitudes towards cancer screening, in addition to breast self-examination, were overwhelmingly positive. For both breast and cervical cancer, 24% reported having treated a patient and 30% reported having conducted a screen for either disease.

*Conclusions:* Overall, while knowledge of both diseases and screening was good, there remain areas for clear educational targeting such as HPV vaccine availability and breast cancer preventability. Attitudes to screening for both diseases were exceedingly positive but, with the exception of breast self-examination, failed to translate into practice due to inadequate resources and patient refusal. Future investments into Somalia's chronic care management should prioritize technology necessary to conduct screenings for both diseases, expanding HPV vaccine access, and understanding patients' potential motivations for refusing screening at the current moment.

#### 46. Effects of the Coenzyme Q10 on the Peripheral Nerve Injury: An Electrophysiological Study

Ahmed Omer Mead<sup>87</sup>

*Background:* Peripheral nerve injuries are a serious clinical concern due to the limited treatment options available. Peripheral nerve injuries are a global health problem that affect mostly young people. Peripheral nerve injuries result from gunshots, automobile accidents, penetrating injuries, and blunt trauma. Coenzyme Q10 (CoQ10) is a natural enzyme that acts as an antioxidant present in both animal and plant cells. CoQ10 is important for health where it protects the DNA and proteins and plays an important role in ATP synthesis.

*Objective:* This study aimed to evaluate the electrophysiological effects of CoQ10 on an experimentally induced acute sciatic nerve injury in a rat model.

*Methods:* In this study, 36 Wistar albino male adult rats (aged 10±2 weeks), weighing 200±50g received from the Animal and Experimental Research Centre of Ondokuz Mayıs University, Samsun, Turkey were used. The rats were randomly divided into six equal groups each consisting of six male rats. Rats were normally kept and housed in plastic cages under normal conditions of 12/12 hours of dark and light

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cycle, at a temperature of about 24°C, with free open access to drinks and food. An experimental sciatic nerve injury model was induced. The rats in short term injury (STI) and long term injury (LTI) groups were induced to 15 and 60 seconds sciatic nerve injury respectively, with a pressure force of 50 Newtons. CoQ10 was administered to the given groups at a dose of 10 mg/kg orally for 21 days. After 21 days, functional nerve recovery was assessed using electromyography (EMG), and the animals were sacrificed.

*Results:* In terms of latency values, a highly significant difference was observed between control (Cont) and STI groups ( $p<0.01$ ), between Cont and LTI groups ( $p<0.01$ ), between Cont and STI+CoQ10 groups ( $p<0.01$ ), and between Cont and LTI+CoQ10 groups ( $p<0.01$ ). In terms of amplitude, a highly significant difference was observed between Cont and STI groups ( $p<0.01$ ), while a similar highly significant difference was observed between Cont and LTI groups ( $p<0.01$ ), between Cont and STI+CoQ10 groups ( $p<0.01$ ), and between Cont and LTI+CoQ10 groups ( $p<0.01$ ). CoQ10 showed improvement in peripheral nerve function. In terms of amplitude and latency, CoQ10 treatment after sciatic nerve injury was more effective in the STI group than in the LTI group.

*Conclusions:* CoQ10 showed positive effects on peripheral nerve injuries by repairing neurological deficits in the sciatic nerve of rats. The oral administration of CoQ10 may improve peripheral nerve functions and nerve regeneration capacity.

#### 47. Mental Health Systems Structure and Innovations in the Horn of Africa: A Systematic Review of the literature

Jibril I.M Handuleh<sup>88,89</sup>

*Background:* The countries included in the Horn of Africa are Somalia, Djibouti, Eritrea and Ethiopia. Health systems in this region are mainly affected by political instability, climate change effects, wars and a weak health infrastructure. The mental health approach from health systems perspectives is a new paradigm in understanding the mental health state of the region. The countries belong to two World Health Organization regional offices namely the Eastern Mediterranean and the African region.

*Objectives:* The objectives of the study are to: examine the health systems of individual countries; and compare countries for public mental health policy direction; and describe the gaps in health systems for innovation using the WHO health system building blocks.

*Methods:* A systematic search of the literature was made between July 2020 to November 2021. Search engines like PsycInfo, Embrace, PubMed and Cochrane were used. MeSH terms Somalia AND Somaliland AND Ethiopia AND Djibouti AND Eritrea are used. The other terms are Human Resources OR Health Policy OR Health Services OR Human Resources OR Medicine and Technologies OR Clinical Pathways. Papers were selected using the Prisma Guideline. Studies meeting the inclusion criteria were those conducted in the four countries during the period 1980-2020, while the studies conducted before the stated date and the papers outside the region were excluded. Thirty papers that met the inclusion criteria were included in the study.

*Results:* The study showed that mental health policies are in the initial phases of preparation in all countries and the mental health funding is extremely low. It also showed almost the same health resources for psychiatry services. Ethiopia is the only country in the region with training programs in psychiatry

*Conclusions:* Despite the different WHO regions, the Atlas reports of the four nations is almost the same. Clinical pathways in the region are mainly different. The Orthodox Church dominates the Ethio-Eritrean presentation while in Somalia and Djibouti the Muslim faith and the Somali culture affects mental health systems. Djibouti and Eritrea have the most limited number of psychiatry services and literature. Further

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research is needed to study the potential implications of innovation using the WHO Atlas report to drive research into the mental health systems of the Horn of Africa.

#### 48. Prevalence and Associated Factors of Khat Chewing among Amoud University Students in Awdal Region, Somaliland

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*Background:* Khat abuse is endemic in East Africa and the Arabian Peninsula. It is the leaf of a tree chewed for euphoric effect and can cause many problems for the individual who consumes it as well as the wider community.

*Objective:* The study aims to find the prevalence of chewing Khat among Amoud university students.

*Methods:* Cross-sectional research was carried out between March 10, 2018, to May 2, 2018. A two-stage stratified cluster sampling scheme was used and selected a total sample of 1153. In the first stage, ten departments from undergraduate programs of Amoud University (primary sampling units) were selected by simple random sampling. In the second stage, one section (secondary sampling unit) was randomly selected (if the number of sections was more than one) from each year of study in each selected program. The study included all the male students in the selected sections, which is a preferred method in most school surveys. In addition, the World Health Organization (WHO) questionnaire for student drug-use surveys was adapted.

*Results:* Finding revealed that 29.4% (339/1153) of Amoud University students chewed khat at least one time in their life. About 17% (196/1153) of total students are current chewers, of whom the majority of them started chewing khat regularly less than a year ago. It was also found that there was a strong relationship between smoking and chewing khat. Also, having a friend who chews khat was strongly associated with the individual chewing khat. Furthermore, having a father or siblings who chew khat was mildly related to the person chewing khat.

*Conclusions:* The study indicates that khat chewing among university students is higher in Amoud students than in studies from neighboring countries.

#### 49. Malpractice among community pharmacy technicians in Mogadishu, Somalia: a case of erectile dysfunction

Abdikarim Hussein Mohamed<sup>91</sup>, Hussein Ali Mohamud<sup>91</sup>, Najib Isse Dirie<sup>92</sup>

*Background:* Erectile Dysfunction (ED) is the most common sexual dysfunction worldwide; approximately 150 million men are affected and their quality of life impaired, including a negative psychosocial impact, feelings of shame, embarrassment, and depression. This study is the first reported from Somalia to the best of our knowledge.

*Objective:* The current study aims to assess knowledge, attitude, and practice (KAP) regarding erectile dysfunction and its medication among community pharmacy technicians in Mogadishu, Somalia.

*Methods:* We have used a cross-sectional descriptive study conducted among pharmacy technicians in Mogadishu, to assess their KAP regarding erectile dysfunction (ED) and its medications. A convenient sampling technique was used. All pharmacy technicians in Mogadishu who were selling erectile dysfunction medications were included in the study. Participants, who refused to participate, held a university degree in pharmacy and pharmacy technicians in hospitals were excluded from the study. A structured questionnaire contained 45 questions, including demographic characteristics (4 items), the

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knowledge of erectile dysfunction and its medications (18 items), attitudes (5 items), and practice (15 items) were assessed among technicians. A total of 200 respondents participated in the study.

*Results:* 79% and 72.5% of technicians had knowledge on the condition of ED, and who it affects, respectively. However, about half did not have knowledge of the underlying risk factors and complications associated with phosphodiesterase 5 inhibitors (PDE5) inhibitors. In addition, 77% to 85% of technicians believe medication requires prescriptions, medications may have complications, and quality medications are important. Regarding practice, 64% of technicians give ED medication with prescriptions, and 64.5% always provide the same type of medication. About half of the technicians also vend herbal medicines to clients such as honey, fish, and sea urchins.

*Conclusions:* The findings of this study suggest pharmacy technicians have some knowledge, although not sufficient for understanding the risks and complications of the medications. Technicians also had beliefs about the importance of quality medication and medical prescriptions. Technicians did not engage in good standard practices despite this knowledge and attitude. These findings highlight the need for regulations to support good practice among pharmacy technicians on the quality, safety, and efficacy of medicines in Mogadishu by establishing the National Medicine Regulatory Authority.

## 50. Scarcity of Peer-reviewed Articles Among Somali Public Health Lecturers

*Abdiwahab Mohamed Hassan*<sup>93</sup>, *Abdulkadir Mohamed Muse*<sup>94</sup>

*Background:* Despite three-decade-long struggles Somalia suffered, universities offering health sciences have significantly increased. Public health is among the fastest-growing disciplines. Well-trained health professionals are necessary for the Sustainable Development Goals (SDG) in Somalia. Health professionals should be able to publish groundbreaking studies. There is no doubt in the significance of health research data for Somalia's health care, however, research publications are scarce compared to other developing countries. This study aims to identify lecturer publications and barriers to research progress.

*Methods:* We utilized online survey tools to collect data from thirty-three current Somali public health lecturers. Further, we determined the sample size using a convenience method depending on the accessible target population. Our selection method was non-randomized, and we shared the survey link in different health professional groups and via emails. Using SPSS and spreadsheets, we analyzed and presented data in graphs and tables.

*Results:* 21% (7) of the participants were females. The majority of the lecturers, 85% (28) hold master's degrees but none hold PhDs. Out of the 7 females, 57% (4) hold master's degree. 21% of the lecturers have been teaching public health for less than 2 years (7), 55% for 3-5 years (18), 21% for 6-8 years (7), and 3% for more than 8 years (1). 51% (17) of the 33 surveyed lecturers have not published any peer-reviewed articles. Of the 48% (16) who have published, 75% (12) of them published only one article; the maximum peer-reviewed articles published by a lecturer were 7. 63% (21) of the lecturers were participating in an on-going research project(s). When we asked about barriers hindering research progress, 72% (24) of the lecturers identified 'lack of resources (e.g., funds, access to databases, etc.)' as a major barrier. 26% (6) identified 'improper research skills', 'lack of inspiration', and 'lack of collaboration' as major barriers. 63% of the lecturers (21) indicated that universities have no clear policy for research publications. Regarding research progress in Somalia, 78% (26) responded 'poor' progress. Collaboration, biostatistics training, funding, clear university research policy, and research political commitment, were among the identified recommendations for remedying Somalia's health research.

*Conclusions:* Lecturers realize the importance of health research in Somalia. Peer-reviewed publications are scarce and lack of resources is a major barrier. Research collaborations and government-level commitment to health research are needed. Continuous studies evaluating progress and barriers of

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health research are crucial. Lecturers show readiness to participate in peer-reviewed publications, although unfortunately, funds and guidance are not in place.

## 5 CLOSING SESSION

### 5.1 Conference Declaration: Working Towards a Brighter Future from Public Health Research to Action in Somalia

*Presented by Dr. Mohamed Abdi Jama, Senior Policy Advisor to the Federal Ministry of Health*

Prior to the closing session of the Garowe Health Research Conference held on the 1<sup>st</sup> February 2022, a final declaration was drafted and shared with the delegates and participants. Queries were encouraged and clarifications provided accordingly. Following this interactive exercise, the participants strongly reaffirmed their endorsement to health research development in support of UHC and SDGs through the following resolution.

#### GAROWE HEALTH RESEARCH CONFERENCE DECLARATION

We, the Representatives of the Federal and State Ministries of Health and other officials of the government of Somalia, Vice Chancellors, Deans, Senior Academicians and researchers from Somalia, Sweden and Norway, the Public Health Agency Sweden, WHO Country Representative and team, other United Nations' agencies, the Somali Swedish Research Cooperation for Health, the Somali Swedish Researchers' Association and the Civil Society organizations assembled in Garowe, Puntland, State of Somalia for a 3-day Conference on health research in the framework of Universal Health Coverage (UHC) and Sustainable Development Goals, held from the 30th January 2022 till the 1st February 2022, wish to express our commitment to cooperate in the advancement of health research as a tool to address the public health challenges in Somalia.

1. We are committed to direct our research focus on health system priorities through the implementation of the Essential Package of Health Services (EPHS) pursuing a roadmap towards Universal Health Coverage, generating the evidence from the burden of diseases analysis and the results from the Somali Health and Demographic Survey (SHDS) 2020, which will enable the Government to define a set of low cost and high impact interventions to be delivered across the health care system.
2. We advocate for a sustained investment in health research and in the implementation of EPHS 2020, which is expected to deliver a proportionate benefit to the population. For instance, the maternal mortality ratio (MMR) is expected to decline to 332 deaths per 100,000 live births (LBs) by the year 2030: signifying a 50% reduction from the present level. Similarly, neonatal, infant and under-five mortality rates are expected to decline from 122, 77 and 38 per 1,000 LBs in 2020, to 63, 42 and 20 deaths, respectively per 1,000 LBs by the year 2030.
3. We are fully cognizant of the low workforce density in the country, which stands at 4.45 doctors, nurses, and midwives per 1,000 population, well below the WHO recommended ratio of 23 per 1,000. According to WHO health workforce guidelines, Somalia will need to bridge the gap of more than 55,000 skilled health professionals, reflecting the magnitude of the human resources for health (HRH) development target. The health system will need to produce and apply an evidence-based practice founded on primary healthcare and aligned with the EPHS and UHC strategy.



4. We applaud the recent efforts of the Government towards the accreditation of the curricula for the preservice educational institutions, the registration and mandatory licensing of the health professionals in line with the National Health Professionals' Council Act, which is a milestone in the health workforce regulation in Somalia.
5. We recognize the absence of properly organized and supported linkages between health research and public policy formulation; and reaffirm our resolve to support and disseminate health system research addressing the barriers to access and utilization and enhance the Government response to epidemics and pandemics such as the current COVID-19 pandemic.
6. We reaffirm our commitment to advanced research in the basic sciences, public health research and to the development of innovative technologies and approaches towards health systems strengthening
7. We will endeavor to foster cooperation between the public and private sector entities in health system research and in delivering scientific practices that can improve services for the Somali people.
8. We are committed to create an environment conducive to research and to the development of new tools through global collaboration, including initiatives supported by the World Health Organization, the Government of Sweden and other development partners of bilateral, multilateral, and philanthropic organizations.
9. We applaud the launching of the Somali Health Action Journal (SHAJ) as a major milestone and an unprecedented instance of the powerful role that a peer reviewed journal can play in bringing together researchers and key national and international stakeholders to work together in addressing the crucial health issues facing the country.
10. We advocate for the journal to serve as a platform for generating constructive interactions between Somali academics and their institutions, the public health professionals, policy makers and health partners and for building collaborative health partnerships based on locally generated knowledge while promoting research capacity building in the country. We laud the efforts of the Somali universities, researchers and international partners who succeeded in placing this open access, peer reviewed health journal on the global map.
11. We are pleased that in the research conference, 50 abstracts and 12 panel presentations and discussions were presented covering all the key health sector priorities, a historic event that opens a new window of opportunity for the young health professionals, serving as a catalyst for capacity development, solidarity and partnerships for health and peace that are closely linked.
12. We commend the panel presentations for addressing all the six key health system components linking them to the research capacity building and illustrating the magnitude of the progress achieved and prospects for organizing research training programs with international health partners.
13. We affirm our commitment to link research to the Primary Health Care (PHC) approach in the EPHS implementation, which will inject the required contextual evidence and build the capacity of future generations, who will use participatory techniques to engage the research users and beneficiaries and will also serve to sensitize national and state leaders about the significance of providing health care as an inalienable human right to everyone regardless of any consideration whatsoever.
14. We affirm to elevate the commitment of young researchers, who once having dipped their toes in the ocean of knowledge, can now not be prevented by any force from swimming far along its beautiful tide of knowledge and knowledge creation, as knowledge is power.

15. We recognize the significant capacity gap in all the components of the health system ranging from service delivery, health workforce, health information systems, access to essential medicines, financing, leadership, policy, and governance. The research evidence gaps in these areas and in public–private partnership will need to narrow down the inherent knowledge gap.
16. We are fully confident in our resolve that by strengthening the link between evidence generation and PHC implementation, the country will be firmly on the path towards the achievement of UHC.
17. We encourage national and international support to strengthen the research institutional capacity of universities in terms of infrastructure, governance, creation of research laboratories with sustainable financing, and ethical boards to oversee the approval of health research involving human subjects
18. We call upon all our national and international partners and stakeholders to make joint efforts towards the attainment of these objectives through mutual accountability and cooperation, and lastly.
19. We thank the organizers and our partners who made this research conference a grand success!

In summary, the Conference Declaration called upon all its national and international research partners and stakeholders to make joint efforts towards the attainment of the set research development objectives through mutual accountability, where Somali researchers take ownership of the research conducted in the country and institutionally contribute to its funding and mentoring of its research activities and create federal and state level boards for research coordination. It also called upon all its national and international research collaborating partners to sustain their support and strengthen the inalienable link between the contextual research evidence and the attainment of UHC.

## 5.2 Closing remarks

On Tuesday, the 1st of February 2022 the Federal Health Minister H.E. Dr Fawziya Abikar Nur chaired the concluding session. This included addresses by the Swedish Ambassador H.E. Per Lindgärde, WHO Representative and Head of Mission, Dr Mamunur Rahman Malik, the Minister of Health for Puntland, H.E Jama Farah Hassan, with closing remarks made by the Chair / Federal Minister for Health.

The Ambassador of Sweden, Mr. Per Lindgärde expressed his delight and satisfaction for joining the closing of the first ever NIH health research conference, laying the foundations for health research in Somalia. “This is a milestone event”, said the Ambassador and thanked all participants, professors, and researchers both from abroad and from within Somalia who had come together and made the conference a great success. His Excellency commended the Puntland state and its Ministry of Health for hosting this national conference in Garowe. He outlined the health research to be an important component of the national health sector development process and NIH evolving as a national center of excellence in the field of public health research. He stressed that because of the COVID-19 pandemic, researchers and research organizations from Sweden and senior Somali Diaspora were only able to *connect through* digital technology, although a few are attending our plenary. “We are indeed very happy”, said the Ambassador for the extensive and crucial knowledge of capacity building that the Swedish institutions and researchers are offering to their Somali partner institutions. The Ambassador commended the Public Health Agency of Sweden (PHAS) for its technical development support to NIH since 2019 and the high-level delegation visit to Somalia in October 2021 led by the PHAS Director General. He regarded the evolving partnership between NIH, the PHAS and WHO as a promising endeavor and truly appreciated the efforts made by Dr. Malik, the WHO Country Representative. Finally, the Ambassador acknowledged the unyielding support offered by H.E. The Minister of Health Fawziya Abikar Nur to NIH and to its Executive Director, while reiterating that the Government of

Sweden will continue to support NIH and Somalia on its path to sustainable peace, development, and good public health for all.

Speaking next, the WHO Country Representative Dr. Mamunur Rahman Malik lauded the Federal Government of Somalia for its exemplary role in organizing this milestone event and commended the international researchers and research institutions from Sweden together with other national and international researchers. Dr. Malik inspired the young and senior Somali researchers by announcing that WHO will work with the NIH to introduce state-of-the-art libraries in federal and state level ministries of health to scale up their research capacities. Moreover, in collaboration with NIH, WHO will award the young researchers capacity building opportunities to present their best research presentation to the forthcoming research conferences. He reminded the audience that in 1990, the concept of the 10/90 gap was introduced, whereby 10% of the global health research is allocated for addressing 90% of global health problems only. A commission set up to address this problem warned that if this disparity was not resolved, the world would experience a large burden of infectious diseases, increasing rates of tuberculosis, malaria, and epidemics of non-communicable diseases including heart diseases. As predicted, Dr Malik informed the audience that the world is currently facing this challenge and called upon the national health research agenda to improve collaboration between the public and private health sector, and through multi-sectoral collaboration address health inequities and increase access to PHC through the EPHS and foster the attainment of the UHC and SDGs across the country.

Subsequently, H. E. Mr. Jama Farah Hassan, the Puntland Minister of Health expressed his pleasure at being a part of this very important conference, and the fact that the first NIH health research conference had been organized in Garowe, the capital city of the state of Puntland, representing the government and the people of Puntland. "We are very grateful to host the conference in Puntland, where priority health topics have been discussed by the national and international researchers attending the conference," said the Minister. He maintained that the high-level participation and enthusiasm demonstrated throughout the duration of the conference was fully acknowledged, as well as the range of research abstracts and panel presentations conducted by Somali researchers and health professionals and academics from national and partner universities or international organizations. He expressed his confidence that such events will lead us to have a better research capacity and quality. The Minister reiterated that our final aim is to use research to enhance the quality of the health services provided to communities to address the most pressing health challenges across the country forging the technical and political commitments necessary to advance UHC.

At the end of the closing session of the conference, the Federal Minister of Health H.E. Fawziya Abikar Nur congratulated the participants of the conference and thanked all the valuable partners who extended their support to the first NIH health research conference held in the country. H.E. expressed her great sense of pride at having launched the establishment of the National Institute of Health in 2019. She had presented the proposal to establish the institute to the Council of Ministers and it had subsequently been endorsed unanimously by the cabinet, with the major role of promoting health research as a driving force of the health system development process and its progress towards UHC and SDGs. The Minister highlighted that the health sector will take the issues raised from the research conference very seriously and that the collected and disseminated evidence will be used for evidence-based decision-making in health policy and practice. The Minister extended her deep gratitude to the Swedish Ambassador, the Swedish International Development Cooperation Agency (Sida), the public health agency of Sweden, the WHO Country Representative, the Puntland Ministry of Health, the SHAJ Editorial Board, the participating Somali, and Swedish universities and all the researchers who attended and contributed to the conference. She outlined that during the 3-day conference, they had presented their research activities through abstracts and plenary presentations on a wide range of priority health system topics that will certainly bring about a huge difference in the future. She highly appreciated the NIH and its Board of Directors that led the conference scientific committee for their contribution to the

success of the conference. Finally, she acknowledged that the research conference was a major avenue for Somali indigenous research dissemination, which would make health research count and accelerate the national political choice, which is the attainment of UHC across the health system.

The conference ended with a Vote of Thanks by NIH Somalia to the Chair and to all the other executives, delegates, and participants.

# ANNEXURES

## A. Conference Organizing Committee

	<b>Name</b>	<b>Title</b>	<b>Organization</b>
1	Dr. Abdifatah Ahmed Diriye	Chairman	Executive Director NIH
2	Dr. Osman Abdi Omar	Member	Consultant Federal Ministry of Health
3	Mukhtar Bulale	Member	Public Health Specialist-NIH
4	Khadar Hussein Mohamud	Member	Head of coordination Federal Ministry of Health
5	Hassan Mohamed Ali	Member	Public Health Emergency operation centre (PHEOC)- NIH
6	Hassan Mukhtar Abukar	Member	IT Officer – NIH
7	Bile Abdi Mohamed	Member	Communication Officer – NIH
8	Sagal Roble	Member	IHR officer – NIH
9	Hamdi Ahmed	Member	Federal Ministry of Health
10	Najma Hirsi	Member	Federal Ministry of Health
11	Siham Abdullahi Mohamud	Member	Federal Ministry of Health
12	Adam Mohamed Hassan	Member	Federal Ministry of Health
13	Kasim Mahdi Sultan	Member	Africa Field Epidemiology Network (AFENET)
14	Abdifatah Mohamed Ibrahim	Member	Africa Field Epidemiology Network (AFENET)
15	Ahmed Mohamed Fidhow	Member	Africa Field Epidemiology Network (AFENET)
16	Sahra Isse	Member	Federal Ministry of Health

## B. Conference Scientific Committee

1. **Khalif Bile Mohamud**, Chair NIH BODs, Advisor to the Federal Ministry of Health (FMOH) and Board member of the Somali Swedish Researchers' Association (SSRA)
2. **Mohamed Abdi Jama**, Senior Policy Advisor to the FMOH and a member of NIH Board of Directors (BODs)
3. **Mayeh Omar**, Associate Professor, Deputy Head and Teaching Coordinator Nuffield Centre for International Health and Development: University of Leeds, UK and a Member of NIH BODs
4. **Abdifatah Diriye Ahmed**, Director of NIH, FMOH
5. **Amina Sekaly**, Deputy Chair of NIH BODs, Associate Professor Faculty of Science, Somali National University, Mogadishu, Somalia
6. **Neima Warsame**, member of NIH BODs
7. **Marian Warsame Yusuf**, Chair of the Somali Swedish Researchers' Association (SSRA), Senior Researcher, Gothenburg University
8. **Abdi Gele**, Senior Researcher, Unit of Migration and Health, Norwegian Institute of Public Health (NIPH), Oslo, Norway
9. **Abdirashid Ali Warsame**, Senior Scientist at Oslo University Hospital
10. **Mohamed Gedi Qayad**, Senior Researcher International Consultant to the World Bank Collaborative Health Project and COVID-19 Advisor to MOH, Somaliland

C. Academic and Health Institutions and Organizations Participating and Presenting at the Research Conference

Somali Universities Participating and Presenting at the Research conference	Somali Health Care Providers and Partner institutions Participating and Presenting at the Research conference
<ol style="list-style-type: none"> <li>1. Somali National University</li> <li>2. Benadir University</li> <li>3. Amoud University</li> <li>4. East Africa University</li> <li>5. Mogadishu University</li> <li>6. Simad University</li> <li>7. Jamhuriya University</li> <li>8. Zamzam University</li> <li>9. Modern University of Science and Technology</li> <li>10. Salam University</li> <li>11. Health Sciences University of Bosaso</li> <li>12. Bosaso University</li> </ol>	<ol style="list-style-type: none"> <li>1. Umeå University-Sweden</li> <li>2. Gothenburg University -Sweden</li> <li>3. Norwegian Institute of Public Health</li> <li>4. Somali Swedish Researcher's Association (SSRA)</li> <li>5. Professionals affiliated with public or private hospitals</li> <li>6. Federal Ministry of Health</li> <li>7. Non-governmental organizations</li> </ol>

## D. Provisional Programme

**First NIH Health Research Conference**  
**“Laying the Foundation for Health Research in Somalia”**  
 30<sup>th</sup> January- 1<sup>st</sup> February 2022

Time	Topics	Presenter/Institution
<b>Day 1: 30/01/22</b>		
7:30-8:30	Registration	
<b>Official opening ceremony (10 min each)</b>		
<b>Chairperson/moderator: Dr Mohamed Mohamud Mohamed, Puntland MOH, Somalia</b>		
08:30-08:35	Recitation of the Holy Quran	Abdirahman Ahmed Ali
08:35-08:45	Welcoming remarks	Dr Mohamed Mohamud Mohamed, Puntland MOH
08:45-09:00	Meeting objectives	Dr Abdifatah Diriye Ahmed, Director of NIH, FMOH
09:00-09:10	Opening WHO remarks	Dr Marina Madeo, Health Policy Advisor – WHO Somalia
09:10-09:20	Opening PHAS remarks	Malin Ahrne, Public Health Agency Sweden
09:20-09:30	Opening AFENET remarks	Dr Herbert Brian Kazoora, AFENET
09:30-09:40	Opening MOH Puntland remarks	H.E Dr. Jama Farah Hassan, Minister of Puntland MOH
09:40-09:50	Official Opening Event	HE Dr Fawziya Abikar Nur, Minister FMOH Somalia
<b>Housekeeping</b>		
09:50-10:00	Housekeeping rules and COVID-19 Guidelines Session	Khadar Hussein Mohamud
10:00- 10:30	Tea & Coffee Break and Group Photo	
<b>Session 1: Health Systems</b>		
<b>Chairperson/moderator: Abdifatah Ahmed Mohamed</b>		
<b>Panel presentation</b>		
10:30-10:50	Health System Research Priorities and the Essential Package of Health Services towards Universal Health Coverage (UHC) are mutually reinforcing	Dr. Mohamed Abdi Jama, Senior Policy Advisor to the FMOH
10:50-11:10	Human Resource for Health - Land Landscape in Somalia	Dr Mohamed Hussein Alasow, Director of HR FMOH
11:10-11:20	IDRS - The way forward	Abdifatah Diriye Ahmed, Director of NIH, FMOH
<b>Abstract presentation</b>		
11:20-11:30	Promoting partnership and local ownership: a case study of how donors engage in the Health Care Sector in Jubaland State of Somalia	Mr Jamal A. Mohammed, Doctoral Candidate, University of Warwick Coventry, UK
11:30-11:40	Linkages between Sustainable Development Goals in Somalia - A Focus on Health	Prof Hassan Warsame Nor, Benadir University
11:40-11:50	Evaluation of Universal Health Coverage of Maternal Health Policies and Programs in Low/middle-Income Countries: A Scoping Review Protocol	Dr Jamila Aden, Africa University, Bosaso, Somalia
11:50-12:00	Systematic Review of the Post-Conflict Health Care System in Somalia from 2000 to 2020	Dr Adam Sheikh Said, RUDN University, Moscow, Russia
12:00-12:20	Discussion	



Time	Topics	Presenter/Institution
12:20-12:30	Role of Assistant Community Based Midwifery in Maternal Health Care System in 12 remote rural villages of Bari and Karkaar regions of the Puntland State of Somalia	Abdikani Said Farah, Aragsan Health Organisation, Puntland, Somalia
12:30-12:40	Factors affecting practice of hand hygiene among adult women: a case study of Wartanabada District, Benadir Region	Dr Abdiaziz Aden Hashi, Benadir University, Somalia
12:40-12:50	Knowledge, attitude and practice of hand washing among mothers in Badbaado Camp, Dharkinley district in Mogadishu, Somalia	Dr Hafsa Mohamud Mohamed, Benadir University, Somalia
12:50-14:10	Prayer and lunch	
14:10-14:20	Medical doctors' awareness of radiation exposure in diagnostic radiology investigations in Somalia	Dr. Ahmed Adam Osman, Somali-Turkish Training and Research Hospital, Somalia
14:20-14:30	Needles stick and sharps injuries and its associated factors among health care workers at SOS hospital in Heliwa District, Mogadishu, Somalia	Nor Haji Osman Abdi, PH Specialist, Benadir Hospital, Somalia
14:30-14:40	Motivation of maternal health workers in conflict setting of Mogadishu, Somalia	Naima Said Sheikh, Health Economist, Norwegian Institute of Public Health, Norway
14:40-15:00	Discussion	ALL
<b>Session 2: Somali Health Research Production and dissemination</b>		
<b>Chairperson/moderator: Dr Klasse Göran Sahlen</b>		
	<b>Panel presentation</b>	
15:00-15:20	Launching the Somali Health Action Journal (SHAJ): new opportunities for research dissemination	Prof Khalif Bile Mohamud, Chair NIH BODs, Sweden; Dr Klasse Göran Sahlen, Umeå University, Sweden
15:20-15:40	Somali health research – past, present and future perspectives: A bibliometric assessment; Policy implications and the Way forward	Stig Wall
15:40-16:00	Development of National Ethical Guidelines for Health Research: providing the ethical framework within which the ethical review process will operate across the health system	Dr Maye Omar, University of Leeds, UK
16:00-16:40	Discussion	ALL
16:40-17:00	Tea Break	
<b>Session 3: Reproductive, Maternal, Newborn, Child and Adolescent Health</b>		
<b>Chairperson/moderator: Dr Mohamed Jama</b>		
	<b>Abstract presentation</b>	
17:00-17:10	Determinants of gestational diabetes mellitus among pregnant women attending antenatal clinics at selected Hospitals, Mogadishu, Somalia	Dr Ibrahim Abdullahi Mohamed, SIMAD University
17:10-17:20	Knowledge, Attitude and Practices regarding Induction Labor among Pregnant Mothers Utilizing Services in Bosaso General Hospital	Dr Sharmarke Hussein Abdi. University of Bosaso.
17:20	Closing of day 1	
<b>Day 2: 31/01/22</b>		
<b>Chairperson/moderator: Dr Mohamed Jama</b>		
	<b>Abstract presentation</b>	

Time	Topics	Presenter/Institution
09:00-09:10	Knowledge, attitude and willingness to accept cesarean section among pregnant woman attending antenatal care at Benadir hospital Mogadishu, Somalia	Dr Abdulahi Ahmed Tahlil, Zamzam University of Science & Technology, Somalia
09:10-09:20	Fertility outcomes after successful obstetric fistula repair; a retrospective study in Keysanay hospital Mogadishu, Somalia	Abdirisak Hassan, Federal Ministry of Health, Somalia
09:20-09:30	Achievements in improving maternal and neonatal Health care in Bosaso, Somalia	Dr Hinda Jama Ahmed, Bosaso, Puntland, Somalia
09:30-09:40	Gender roles and their influence on the sexual and reproductive health of youth in a postconflict context	Gallad Dahir Hassan, Somali National University, Somalia
09:40-09:55	Discussion	
09:55-10:05	Prevalence of intrauterine fetal death among women gave birth at Banadir Hospital: 1year retrospective, cross-sectional study.	Sahra Mire, Benadir University, Somalia
10:05-10:15	Factors associated with stunting among children aged 6-59 months attending two public hospitals Mogadishu-Somalia, a case control study	Dr Mohamed Aden Mohamed, SOS Hopital, Somalia
10:15-10:25	Factors Associated With incomplete immunization among children aged 12-23 month attending WARDI community hospital Mogadishu Somalia	Dr Ja'far Abdullahi Omar Benadir University, Somalia
10:25-11:00	Tea Break	
11:00-11:10	Measles outbreak investigation Deynile district, Banadir region, Somalia	Dr Saidia Hassan Hussein, AFENET, Somalia
11:10-11:20	Prevalence and factors associated with anaemia among children aged 6 to 59 months attending Banadir hospital in Mogadishu, Somalia.	Dr Ibraahim Abdullahi Guled, Somali National University, Somalia
11:20-11:30	Pertussis outbreak investigation Galkayo district, south Mudug region, Somalia, November, 2021	Dr Mohammed Hassen Ali, Galmudug State, Somalia
11:30-11:40	Breastfeeding practice among Somali mothers in Kisenyi, Kampala district Uganda	Dr Mohamed Mohamud Shobow, Salaam University, Somalia
11:40-11:50	Knowledge, attitude and practice female genital mutilation among women in productive age in M CH Hodan district in Mogadishu, Somalia	Dr. Fatuma Ismail Mohamed, Benadir Hospital, Somalia
11:50-12:10	Barriers to Accessing Healthcare Services for Somali Women in Somalia	Abdifatah Ahmed Mohamed, FMOH, Somalia
12:10-12:20	Discussion	
<b>Session 4: Communicable Diseases</b>		
<b>Chairperson/moderator: Dr Marina Madeo Health Policy Advisor – WHO Somalia</b>		
12:20-12:30	Utilization Long-Lasting Insecticide Nets (LLINS) use among household members for protection against mosquito bite	Dr Abdinur Abdullahi Salad, Benadir University, Somalia
12:30-14:00	Prayer and lunch	
14:00-14:10	Incidence of adverse drug reactions among patients on new MDRTB treatment in Forlanini hospital, Mogadishu	Dr Osman Muhyadin Abdule, Benadir University, Somalia

Time	Topics	Presenter/Institution
14:10-14:20	Clinical Outcomes of 1111 Patients with Multi-Drug Resistant Tuberculosis in Somalia.	Aweis Ahmed Moallim, PH Specialist, Mogadishu University, Somalia
14:20-14:30	Rifampicin Resistant Mycobacterium Tuberculosis Prevalence and Risk Factors in Children under the Age of Fifteen Years among MDR Patients Attended at Mogadishu MDR-Centre in Mogadishu, Somalia: Retrospective Cross-Sectional Study	Dr Mohamed Abdirahman Omar, Benadir University, Somalia
14:30-14:40	Delay of TB patients in diagnosis in a conflict setting of Mogadishu, Somalia - a crosssectional study	Abdulwahab M. Salad, PH Specialist, Somali National University, Somalia
14:40-14:50	Magnetic resonance imaging findings of intracranial Tuberculoma patients in tertiary hospital in Mogadishu, Somalia	Dr Ismail Gedi Ibrahim, Somali Turkish Training and Research Hospital, Somalia
14:50-15:00	Determinant factors for the occurrence of Tuberculosis among people living with HIV after ART initiation in selected public hospital in Mogadishu-Somalia 2020 - case control studies	Dr Abdulkadir Mohamed Ahmed Keynan Benadir University, Somalia
15:00-15:10	Assessment of non-adherence anti-TB drugs and associated factors among TB patients attending TB centers during COVID-19 pandemic in Mogadishu, Somalia.	Dr. Abdullahi Abdirahman Omar, SIMAD University, Somalia
15:10-15:30	Discussion	
<b>Chairperson/moderator: Dr Abdi Gele</b>		
15:30-15:40	Prevalence of COVID-19 Vaccination Acceptance and Its Associated Factors Among Elderly People [>60 Years] Living in Benadir Region, Southeastern Somalia	Dr Abdiweli Mohamed Abdi, Modern University Science and Technology, Somalia
15:40-15:50	Perceived stress, anxiety and depression and its associated factors during COVID 19 pandemic among healthcare workers in COVID 19 health facilities in Mogadishu Somalia	Dr Abdirazak Yusuf Ahmed, De Martino Public Hospital, Somalia
15:50-16:00	Knowledge, attitude and practice (KAP) towards COVID-19 among faculty of Health Sciences students at Mogadishu University	Mr Walid Abdulkadir Osman, Mogadishu University, Somalia
16:00-16:30	Tea break	
16:30-16:40	Level of knowledge on health care workers toward prevention of hepatitis B infection in Digfer and Abu-Bashir hospitals in Mogadishu- Somalia	Dr Ahmed Sheikh Ali Ahmed, Somali International University, Somalia
16:40-16:50	Uptake of hepatitis B vaccination among healthcare workers in selected hospitals, Mogadishu, Somalia	Dr Abdirizaq Ali Yusuf, Somali National University, Somalia
16:50-17:00	Assessment of Hepatitis B Vaccination Status and Associated Factors among Health Workers in Bosaso, Puntland, Somalia	Dr Nur Ahmed Hussein, University of Health Sciences, Bosaso, Somalia
17:00-17:20	Discussion	ALL
17:20	Closing day 2	
<b>Day 3: 01/02/22</b>		
<b>Chairperson/moderator: Dr Marian Warsame Yusuf</b>		
	<b>Abstract presentation</b>	

Time	Topics	Presenter/Institution
09:00-09:10	Prevalence of urinary tract infection among pregnant women attending at antenatal care clinics in Benadir hospital Mogadishu Somalia.	Dr Yahye Sheikh Abdulle, Jamhuriya University of Science and Technology, Somalia
09:10-09:20	Study of bacterial contamination on mobile phone among healthcare professionals in Wardi community hospital	Dr Adam Sharif Abdulkadir Abdirahman, Salaam University, Somalia
09:20-09:30	Antimicrobial susceptibility of Escherichia coli isolates from diabetic patients in Mogadishu, Somalia	Dr Shafie Abdulkadir Hassan, Jamhuriya University of Science and Technology, Somalia
09:30-09:40	Nosocomial infection control among health workers at Benadir and Shaafi hospitals in Mogadishu, Somalia	Dr Jamal Muhumed Mohamed, Benadir University, Somalia
09:40-10:00	Discussion	
<b>Session 5: Non-communicable Diseases</b>		
<b>Chairperson/moderator: Dr Abdikamal Ali Salad</b>		
10:00-10:20	Panel presentation Humanitarian emergencies in the framework of primary health care practices and approaches: a scoping review focusing on their mutually reinforcing goals and results to achieve	Prof Khalif Bile Mohamud
10:20-10:50	Tea Break	
<b>Abstract presentation</b>		
10:55-11:05	Patterns of Limb amputations at selected Hospital: A Retrospective study	Dr Mohamed Abdullahi Awale, SIMAD, Somalia
11:05-11:15	Cardiovascular Risk Factors and Clinical Outcomes of Patients Hospitalized with COVID-19 Pneumonia in Somalia	Dr Ahmed Mohamud Hussein, Mogadishu University, Somalia
11:15-11:25	Knowledge, Attitudes, and Practices Concerning Breast Cancer, Cervical Cancer, and Screening Among Healthcare Professionals and Students in Mogadishu, Somalia	Dr Mohamed Abdullahi Awale, Benadir University, Somalia
11:25-11:35	Effects of the Coenzyme Q10 on the Peripheral Nerve Injury: An Electrophysiological Study	Ass. Prof Ahmed Omer Mead, Salaam University, Somalia
11:35-11:45	Mental Health Systems Structure and Innovations in the Horn of Africa: A Systematic review of the literature	Dr Jibril I.M Handuleh, Amoud University, Somaliland
11:45-11:55	Prevalence and Associated Factors of Khat Chewing among Amoud University Students in Awdal Region, Somaliland	Dr Abdifatah Haji Daud, Amoud University, Somaliland
11:55-12:05	Malpractice among community pharmacy technicians in Mogadishu, Somalia: a case of erectile dysfunction	Abdikarim Hussein Mohamed, Mogadishu Somalia Turkish training and research hospital, Somalia
12:05-12:15	Scarcity of Peer-reviewed Articles Among Somali Public Health Lecturers	Mr Abdiwahab Mohamed Hassan, Somali Institute for Development Research and Analysis, Somalia
12:15-12:30	Discussion	
12:30-14:00	Prayer and lunch	
<b>Session 6: Research Training and capacity building - Linking Research to Action</b>		

Time	Topics	Presenter/Institution
<b>Chairperson/moderator: HE Dr Fawziya Abikar Nur, assisted by Dr Mohamed Jama</b>		
14:00-14:10	Field Epidemiology training programme in Somalia: experience and lesson learnt	Dr Tatek, AFENET, Somalia
14:10-14:30	Building capacity for Somali health research: Training of trainers in a blended learning model; Implications for university collaboration and the way forward	Dr Klasse Göran Sahlen, Umeå University, Sweden
14:30-14:50	Bridging research to action: Strengthen health research partnerships and collaboration	Prof Khalif Bile, Chair NIH BODs
14:50-15:30	Statistical methods and software: The choice of methods; The presentation of results and statistical review of a paper	Dr Max Betzold Gothenburg University, Sweden
15:30-16:10	Meeting the Editors: scientific writing and publishing – some rules and sins	The SHAJ Editorial Team and Editorial Board
16:10-16:30	Discussion	
16:30-17:00	Tea Break	
	<b>Official Closing Ceremony</b>	
	Moderator: H.E Dr. Jama Farah Hassan, Minister of Health of Puntland State of Somalia	
17:00-17:10	Conference summary and way forward	Dr. Mukthar Bulale
17:10-17:20	Resolution and Declaration	Dr Khalif Bile
17:20-17:30	Closing remarks SIDA/Swedish Embassy	Ambassador Per Lindgarde, SIDA
17:30-17:40	WHO Country Representative Closing remarks WHO	Dr Mamunur Malik, WHO representative, Somalia
17:40-17:50	Minister of Health of the Puntland State of Somalia closing remarks	H.E Dr. Jama Farah Hassan, Minister of Health Puntland
17:50-18:00	Federal Ministry of Health and Social Care closing remarks	HE Dr Fawziya Abikar Nur, Minister of Health Somalia
18:00-18:10	President of the Puntland State of Somalia closing remarks	HE Siciid Abdullahi Deni, President of Puntland, FGS

## E. Photo Gallery





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