

# **Ethiopian Public Health Association (EPHA)**



## **Abstract Book**

**33<sup>rd</sup> EPHA Annual Conference**

**13-15 March 2022**

**Main Theme: Conflict, Public Health and Health System Resilience**

**March, 2022**

**Addis Ababa**

**Compiled by:**

Tesfanesh Masresha  
Mercy Abebaw

**Edited by:**

Prof. Alemayehu Haddis  
Tesfa Demelew  
Zewd Teferra  
Yusuf Abdu

**Ethiopian Public Health Association**

**Tel. +251-11-416-60 83/41**

**Fax: +251-11-416-60 86**

**P. O. Box: 7117**

**Addis Ababa, Ethiopia**

**E-mail: [info@etpha.org](mailto:info@etpha.org)**

**Website: [www.etpha.org](http://www.etpha.org)**

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## *Message from the Executive Director*

*Ethiopian Public Health Association (EPHA)'s membership has grown to over 8800 ever-registered members of diverse background including public health, bio medical and social science disciplines.*

*EPHA existed to achieve its mission to “promoting better health for the public and maintaining professional standards through advocacy, active involvement of its members, networking and evidence generation”.*

*One of the significant and flagship of EPHA as a professional association is organizing annual conference that creates a platform of a scientific forum to members working in Public Health, research institutions both government and Non-government and the Academia.*

*EPHA conducts its 33<sup>rd</sup> Annual Scientific Conference and General Assembly Meeting that will be held 13-15 March 2022 at Inter-Luxury hotel, Addis Ababa. The main theme of the Conference this year is: **“Conflict, Public Health and Health System Resilience”**. Similar to the previous year, this year too EPHA conducts its annual conference while combating COVID-19 spread that left millions of life morbid and dead.*

*This year, research abstracts covering a wide range of Public Health issues including Conflict and Public Health, Epidemiology, RH and Gender, Mental Health and NCD, Health Literacy and Health Behaviors, Health System, Nutrition and Food Science, Biomedical Science, Environmental Health and Traditional Medicine have been submitted, reviewed and made ready for presentation. A total of 100 scientific papers 50 each for oral and poster have been selected through a series of peer review process. Moreover, moderated panel sessions will be held under three sub-themes of the conference namely: Public health consequences of conflict; impact of conflict on RMNCH and recovery and rebuilding resilient health system.*

*EPHA would like to extend its sincere gratitude to all scientific paper contributors' reviewers and to those who have accepted the invitation to serve as Moderator of both panel and concurrent sessions and speaker of the panel.*

*Last but not least, EPHA would like to extend its appreciation to all who have made their contributions to make the 33<sup>rd</sup> EPHA annual scientific conference and General Assembly Meeting a reality.*

*Alemayehu Mekonnen (MD, MPH, Associate professor of Public Health)  
Executive Director, EPHA*

# **Oral Presentations**

## Conflict and Public Health

Abs 1

### **Policy Implication of Burden and Trend of Violence in Sub-Sahara 1990-2019, A Systematic Analysis for The Global Burden of Disease Study 2019.** *Dr.Atael Fentahun Awedew*

**Background:** Violence has contributed sizable portion of morbidity, mortality, economic hardship, psychological scaring, and social unrest in sub-Sahara

**Objective:** To provide regional and national incidence, mortality, and DALYs of violence and policy implications in Sub-Sahara Africa from 1990-2019

**Methods:** Data source, classification and analysis methods were according to Global burden of Disease (GBD) 2019 analytic methodology.

**Results:** In 2019, there were 4.9million (95%UI: 4-5.9million) incident cases, 163,000(95%UI: 141,000-186,000) deaths, 9.9million (95%UI: 8.6-11.4million) DALYs of violence in Sub-Sahara. From 1990-2019, Incident cases, death and DALYs counts of violence were decreased by 73%(95%UI :-75 to 71%), 2%(95%UI : -14 to 11%), and 6%(95%UI : -17 to 5%) respectively while age-standardized rates of incident, death, and DALYs of violence were also decreased by 87%%(95%UI : -88 to -86%), 50%(95%UI : -55 to -44%0, and 53%(95%UI : -58% to -47%) respectively. In 2019, Shared violence related mortality were Self-Harm 42 %( 95%UI: 40-45%), Interpersonal violence 50 %( 95%UI: 49-52%), Conflict and terrorism 6.8 %( 95% UI: 6.5-7.2%), and Executions and police conflict 0.66 %( 95%UI: 0.63-0.7%) . Conclusion: Despite of trends of violence has decreased with national and regional heterogeneity during the study period, burden of violence has played substantial portion of morbidity, mortality, and economic hardship in sub-Sahara.

**Key words:** Burden, violence, Sub-Sahara, GBD, Global burden of Disease

**Reducing Road Traffic Accident: Rapid Evidence Synthesis.** *Tesfaye Dagne Weldemariam*

**Background:** The number of roads traffic death remains unacceptably high. Global estimate shows that about 1.35 million people die and millions are seriously injured by road traffic accident. Road traffic accident is the 8th leading cause of death among people of all ages and it is the leading cause of death for children and young adult of 5-29 years of ages. Such disastrous problems is worsening with the increasing number of vehicles.

**Objective:** To summarize the best available evidence on intervention that can reduce road traffic accident.

**Method:** A rapid evidence synthesis approach adapted from the SURE Rapid Response Service was applied to search, appraise and summarize the best available evidence on effective intervention in reducing road traffic injury. To answer the question under review we searched for relevant studies from databases including PubMed, the Cochrane Library, TRANSPORT, Health system evidence, Epistemonikos and SUPPORT summary. The following key terms were used for searching: Road traffic accident, RTA, Injury, Reduce\*, Prevent\*, Minimize\*, “Low and middle income country”, LMIC. We found 18 articles through search of different data bases mentioned above. After screening for the titles and abstracts of the articles, four of them which satisfy the inclusion criteria were included in the final review.

**Finding:** The identified interventions to reduce road traffic accident were Legislation and enforcement, Public Awareness/Education, Speed Control/ rumble strips, Road Improvement, Mandatory motorcycle helmet, graduated driver license (GDL), Street lighting

**The Burden of Internal Conflict on Expanded Programs on Immunization in Northwest Ethiopia: Implementation Science Study:** *Geta Asrade, Kassahun Alemu, Ejigu Gebeye, Melkamu Walle, Alemayehu Teklu, Zeleke Abebaw Mekonnen, Amsalu Shiferaw, Abraham Assan, Binyam Tilahun*; Email: [ejigugebeye@gmail.com](mailto:ejigugebeye@gmail.com) , Phone: +251902744887; Affiliation: University of Gondar

**Background:** Despite the rapid progress in immunization service delivery systems worldwide, populations in areas of conflict often have limited or no access to lifesaving vaccines. Hence, evidence generation and translation for context-specific strategies and tailored action would be supreme important before, immediate and post aftermath of an acute humanitarian emergency.

**Aim:** To explore factors affecting immunization services during and following conflict among internally displaced communities in Northwest Ethiopia.

**Methods:** Qualitative and quantitative research methods were applied. phenomenological study design and in-depth interview was applied to collect the lived experiences of participants in the affected areas. Transcribed and translated data were analyzed and thermalized using open code software. Quantitative data were analyzed descriptively using an excel sheet to develop immunization coverage trend for tracer antigens.

**Results:** We found that the immunization program was seriously deteriorated during and following the conflict in the study area. The monthly EPI service report in the affected areas showed a decline with the lowest records in December and January when the internal conflict was peak. Security problems, displacement of health workers, destruction of health infrastructures, mixing of the displaced community in the host community and poor coordination among stakeholders and partners, clients having other emergent needs and shortage of resources were important barriers for immunization services.

**Conclusion and recommendations:** Vaccination services were highly compromised in conflicts. Security problems affected not only the service utilizers but also service providers and the overall health system. To minimize this burden, the coordination of stakeholders and strong leadership system is required.

**Key words:** Conflict, internally displaced, immunization services

### **Validation of Risk Prediction Model for Outcomes of Severe Community Acquired Pneumonia Among Under- Five Children in Amhara Region, Northwest Ethiopia.** *Zelalem Alamrew Anteneh*

**Background:** Globally, pneumonia accounts for 15% of under-five deaths, and it is the cause of more than 17% of under-five mortality in Ethiopia. Clinical decision-making is a key aspect of intervention to be offered to the child with pneumonia in the clinical setting. However, there are limited tools such as models and risk score available to assist the clinical judgment by health care providers in low income setting. Therefore, the aim of this study was to validate prediction model and develop risk scores for poor outcomes of severe community acquired pneumonia in children.

**Methods:** A prospective cohort study was conducted among under five years children hospitalized with severe community acquired pneumonia in public hospitals, Northwest Amhara region from February to May 2020. A total of 539 under children were included in the study. Data analysis was performed using R version 4.0.5 software; bivariate logistic regression was done to select candidate prognostic determinants, a p-value of 0.25 used as a cut-off value to enter into the multivariate prediction model. A stepwise backward multivariable analysis was done to validate the prediction model. We developed a simplified risk score from the model to facilitate clinical utility. Model performance was evaluated using the area under the receiver operating characteristic curve (AUC) and calibration plot. All accuracy measures were internally validated using the bootstrapping technique. A decision curve analysis was used to evaluate clinical and public health utility of our model across various threshold probabilities.

**Results:** The incidence of poor outcomes of pneumonia was 151(28%) (95%CI: 24.2%-31.8%). Out of 14 candidate predictors entered the original multivariate model, Vaccination status, fever, pallor, unable to breastfeed, impaired consciousness, CBC positive, entered ICU, and vomiting were remained in the reduced model. The AUC of the original model was 0.927, 95%(CI (0.90, 0.96). There is no difference between observed and predicted probabilities (p-value of 0.132). Based on Youden index cut of point, the sensitivity(S), specificity (SP), positive predictive value (PV+), and negative predictive value (PV-) of the model were 80%, 94%, 83%, and 92% respectively. Our decision curve analysis for the model provides a higher net benefit across ranges of threshold probabilities.

**Conclusion:** Our model has an excellent discrimination and calibration performance. Similarly, the model with simplified risk score has a magnificent discrimination and calibration ability with insignificant loss of accuracy from the original model. The model use can have potential to improve care and outcomes in the clinical setting.

**Keywords:** Prediction Model, Outcomes of Pneumonia, Risk score, Children, Ethiopia

**Malaria and Helminthic Co-Infection during Pregnancy in Sub-Saharan Africa: A Systematic Review and Meta-Analysis.** *Minyahil Tadesse Boltena*

**Background:** Malaria and helminthic co-infection in pregnancy cause feto-maternal haemorrhage and fetal growth retardation. Concurrent malaria and helminthic infection during pregnancy continue to be a public health concern in low – resource settings. This study aimed at determining the pooled burden of comorbid gestational malaria and helminthic infections in sub-Saharan Africa.

**Methods:** CINAHL, EMBASE, Google Scholar, Scopus, PubMed, and Web of Science databases were used to retrieve published and unpublished literature. No restrictions were made to the language and year of publication of articles. The Joanna Briggs Institute’s critical appraisal tool for prevalence studies were used for quality assessment. STATA Version 14.0 was used to conduct the meta-analysis. The  $I^2$  statistics and Egger’s test were used to test the heterogeneity and publication bias. The random effect model was used to estimate the pooled prevalence at 95% confidence interval (CI).

**Result:** A total of 14, 087 pregnant women participated in this study. Twenty-four cross-sectional studies were eligible for the final analysis. The pooled prevalence of gestational malaria and helminthic co-infection were 20% (95%CI 15 – 26). The pooled prevalence of malaria among pregnant women with clinically confirmed helminthic infection was 33% (95%CI 25 – 41). The pooled prevalence of gestational helminthic infection among pregnant mother immune-suppressed by plasmodium parasitemia was 35% (95%CI 25 – 45). The most prevalent helminthic infections reported among pregnant women immune – compromised by gestational malaria were *Hookworm* (48%), *Ascaris lumbricoides* (37%), *Trichuris trichuria* (15%).

**Conclusion:** Significantly higher malaria and helminthic co-infection during pregnancy were observed. Health systems strengthening gatekeepers and health policy framers in sub-Saharan Africa must put in place home-grown innovative solutions to underpin context-specific policies and practice for early initiation of effective intermittent preventive therapy for prevention of malaria in pregnancy. Investments in reverse vaccinology to augment cutting – edge research and innovations in the comorbidity of malaria and helminths during pregnancy through public –private partnerships must be implemented by sub-Saharan African countries and their international development partners.

**Keywords:** Co-infection, Comorbidity, Helminthic infections, Pregnancy malaria, sub-Saharan Africa.



## **Individual and Community Level Factors of Pre-Marital HIV Testing Status among Married Women in Ethiopia: A Multi-Level Factor Analysis Model.** *Molla Yigzaw Birhanu*

**Introduction:** Marriage with sero-discordant couples puts HIV negative spouses at risk and accounts for 65–85 percent of new infections acquired. Pre-marital HIV testing opens the door to HIV prevention and control by reducing heterosexual transmission between partners and protecting against negative spouses and vertical transfer from mother to child. As a result, pre-marital HIV testing is essential in order to fully enjoy the right to marry and begin a family. In Ethiopia, there is no information about pre-marital HIV testing status, both at the individual and communal levels. Accordingly, this individual and community-level associated factors of pre-marital HIV testing status among married women in Ethiopia was conducted to fill the gap.

**Methods:** This study made use of secondary data from the 2016 EDHS. The study included 10008 married women in the reproductive age, nested into 645 clusters. Data were retrieved from EDHS databases after obtaining permission from the DHS Program. Due to the nested structure of the data, a multi-level logistic regression model was used for analysis. Individual and community level variables were found. Using AIC to compare the models, the full model was determined to be the best model among the fitted models. To identify associated factors of pre-marital HIV testing at the individual and community-levels, p-value <0.05 with CI was used to declare the presence or absence of association between the outcome and associated factors.

**Results:** In Ethiopia, 21.4% (95% CI: 20.6, 22.2%) of study participants had pre-marital HIV testing. There was high heterogeneity between clusters for pre-marital HIV testing, accounting for 57.89% of the overall variation. Individual-level variables: age between 35 and 49 (AOR = 0.25; 95% CI: 0.09–0.66), being educated (AOR = 1.76; 95% CI: 1.17–2.79), and being rich in wealth index (AOR = 1.95; 95% CI: 1.13–3.55) as well as community-level characteristics: having media exposure (AOR = 1.54; 95% CI: 2.3–4.71) and high community literacy (AOR = 0.38; 95% CI: 0.22–0.66) were significantly associated with pre-marital HIV testing.

**Conclusion:** The mandatory pre-marital HIV testing practices among married reproductive age women in Ethiopia is insignificant in order to eliminate the HIV/AIDS epidemic by 2030. Being between the ages of 35 and 49, as well as having a high level of community literacy, were characteristics that hampered pre-marital HIV testing, but being educated, having a high wealth index, and having media exposure were factors that increased pre-marital HIV testing. Education for awareness creation through different media for all reproductive age group should be provided strongly. Education about the necessity of pre-marital HIV testing for awareness creation, as well as establishing guidelines and regulations for all reproductive age groups, should be vigorously promoted through various media and given the serious human rights and public health implications, the Ethiopian government should make pre-marital HIV testing mandatory in order to reduce HIV transmission to negative spouses. Additionally, governments and HIV program implementers must act quickly to identify and eliminate the practice, as well as ensure that it is prohibited by law and policy.

**Keywords:** Pre-marital, Married women, HIV testing, Multi-level, Ethiopia.

**Incidence and Predictors of Mortality among Covid-19 Patients Admitted to Treatment Centers in North West Ethiopia; A Retrospective Cohort Study, 2021.** *Belayneh Mengist Miteku*

**Background:** Currently, coronavirus disease 2019 (COVID-19) is the leading cause of death and the rate of mortality is rapidly increasing over time. There is a paucity of information regarding the incidence and predictors of mortality among COVID-19 patients from low-income countries, particularly in Ethiopia. Therefore, this study was aimed to assess the incidence and predictors of mortality among COVID-19 patients admitted to treatment centers in North West Ethiopia.

**Methods:** An institution-based retrospective cohort study was conducted among 552 laboratory-confirmed COVID-19 cases at Debre Markos University and Tibebe Ghion Hospital COVID-19 treatment centers in North West Ethiopia from March 2020 to March 2021. Data were collected from patients' medical records using a structured data extraction tool. Data were entered using Epi-Data version 3.1 and analyzed in STATA 14 statistical software. The Kaplan Meier survival curve and log-rank tests were used to estimate survival time and to compare survival status. Bivariable and multivariable Cox-proportional hazards regression models were fitted. Cox proportional hazard assumption and model fitness were checked. Hazard ratio with its 95% confidence interval and a P-value < 0.05 was used to identify significant predictors of mortality.

**Result:** The overall mortality rate of COVID-19 was 4.7, (95 % CI: 3.3–6.8) per 1000 person day observations, and 76% of deaths occurred within the first week of hospitalization. The mortality rate of COVID-19 patients varied across socio-demographic and clinical characteristics of patients. Advanced age (AHR: 4.9; 95% CI: 1.8, 13.5), rural residence (AHR: 0.18; 95% CI: 0.05, 0.64), presence of hypertension (AHR: 3.04; 95% CI: 1.18, 7.8), presence of diabetes mellitus (AHR: 8.1; 95% CI: 2.9, 22.4) and cardiovascular disease (AHR: 5.2; 95% CI: (1.69, 16.2) were significantly associated with mortality.

**Conclusions:** The rate of mortality among hospitalized COVID-19 patients in this study was low. COVID-19 patients from urban residences, older patients, and patients with hypertension, diabetes mellitus, and cardiovascular disease have a high risk of death. These high-risk groups need careful observation and should be prioritized for COVID-19 vaccinations.

**Keywords:** Coronavirus; mortality; survival analysis; Ethiopia

**Magnitude, Pattern and Correlates of Multi-Morbidity among Patients Attending Chronic Outpatient Medical Care in Bahir Dar, Northwest Ethiopia: The Application of Latent Class Analysis Model.** *Fantu Abebe Eyowas*

**Introduction:** Multi-morbidity- the simultaneous occurrence of two or more chronic conditions in a given individual is increasing globally. Living with multi-morbidity is associated with higher mortality rate, impaired functioning and reduced health related quality of life. Despite the huge challenge multi-morbidity poses, however, knowledge concerning the trends, patterns and determinants of multi-morbidity remains limited.

**Objective:** This study aimed to investigate the magnitude, pattern and associated factors of multi-morbidity in Bahir Dar, northwest Ethiopia.

**Methods:** A multi-centered facility-based study was conducted among 1440 participants aged 40+ years attending chronic outpatient medical care. Two complimentary methods (interview and review of medical records) were employed to collect data on socio-demographic, behavioral and disease related characteristics. The data were analyzed by STATA V.16 and R Software V.4.1.0. We run descriptive statistics and fitted logistic regression and latent class analyses (LCA) models to determine the associated factors and patterns of multi-morbidity. Statistical significance was considered at p-value  $\leq 0.05$ .

**Results:** The magnitude of individual chronic conditions ranged from 1.4% (cancer) to 37.9% (hypertension), and multi-morbidity was identified in 54.8% (95% CI=52.2%-57.4%) of the sample. The likelihood of developing multi-morbidity was higher among participants aged 45-54 years (AOR: 1.5, 95%CI= 1.1, 2.1), 55-64 years (AOR: 2.5, 95%CI=1.7, 3.5) and 65+ years (AOR: 2.4, 95%CI=1.7, 3.5) compared to those aged 40-44 years. The odds of multi-morbidity was also higher among individuals classified as overweight (AOR: 1.6, 95%CI=1.2, 2.1) or obese (AOR: 1.9, 95%CI=1.3, 3.0) than the normal weight category, and among those individuals who believe in external locus of control (AOR: 1.8, 95%CI=1.3, 2.5). Four patterns of disease clustering were identified, the cardiovascular category being the largest class (50.2%), followed by the metabolic group (32.6%). Advanced age, overweight and obesity predicted latent class membership, adjusting for relevant confounding factors.

**Conclusions:** The magnitude of multi-morbidity in this study was high. The most prevalent conditions shaped the pattern of multi-morbidity. Advanced age, overweight and obesity were the factors correlated with multi-morbidity. Health service provision should be guided by the realities in disease burden and patterns of multi-morbidity. Further research is required to better understand the impacts of multi-morbidity on individual's wellbeing and survival.

**The Association between HIV Diagnosis Disclosure and Adherence to Anti-Retroviral Therapy among Adolescents Living With Hiv In Sub-Saharan Africa: A Systematic Review And Meta-Analysis.** *Melkamu Merid Mengesha, Awugchew Teshome, Dessalegn Ajema, Abera Kenay Tura, Inger Kristensson Hallström, Degu Jerene*

**Introduction:** Nine in ten of the world's 1.74 million adolescents living with human immunodeficiency virus (ALHIV) live in sub-Saharan Africa (SSA). Suboptimal adherence to antiretroviral therapy (ART) and poor viral suppression are important problems among adolescents. To guide intervention efforts in this regard, this review presented pooled estimates on the prevalence of adherence and how it is affected by disclosure of HIV status among ALHIV in SSA.

**Methods:** A comprehensive search in major databases (Excerpta Medica database (EMBASE), PubMed, Ovid/MEDLINE, HINARI, and Google Scholar) with additional hand searches for grey literature was conducted to locate observational epidemiologic studies published in English up to December 2021 with the following inclusion criteria: primary studies that reported disclosure of HIV status as an exposure variable, had positive adherence to ART as an outcome, and conducted among adolescents and children. The COVIDENCE software was used for a title/abstract screening, full-text screening, the JBI quality assessment checklist, and data extraction. Random effects model was used to pool estimates. Furthermore, sensitivity analysis and subgroup analysis were also conducted by age groups and type of adherence measures used.

**Results:** Of the total 1579 studies located, 11 studies were included in the qualitative description and nine in the quantitative pooling with a total of 2806 participants. Self-reported pooled prevalence of adherence to ART was 76% (95% CI (confidence interval): 62, 88;  $I^2=97.6\%$ ,  $P[1]value<0.001$ ) and it was higher among the disclosed, 80% (95% CI: 66, 91;  $I^2=96.4\%$ ,  $P[1]37value<0.001$ ). Overall, disclosure of HIV status increased the odds of adherence by over two-fold (odds ratio (OR) =2.3, 95% CI: 1.27, 4.17;  $I^2=79.1\%$ ,  $P-value<0.001$ ). This was further confirmed in a subgroup analysis by age (adolescent only subgroups, five studies; OR=2.5, 95% CI: 1.11, 5.64;  $I^2=56.7\%$ ,  $P-value=0.003$ ) and type of adherence measure and adjustment to confounding (4 studies, OR=4.02, 95% CI: 2.35, 6.96;  $I^2=56.7\%$ ,  $Pvalue=0.074$ ), the association further got stronger.

**Conclusions:** Our systematic review and meta-analysis identified that HIV status disclosure improved adherence, particularly among adolescents. Our findings implied that disclosure should be encouraged for a better outcome with adherence among adolescents.

**Systematic review registration:** this systematic review and meta-analysis is registered in the International Prospective Register of Systematic Reviews (PROSPERO) and can be accessed online at ([https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42020178084](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42020178084)).

## **Factors Contributing to Occupational Injuries among Workers in the Construction, Manufacturing, and Mining Industries in Africa: A Systematic Review and Meta-Analysis.**

*Mitiku Bonsa Debela*

**Background:** The finding from Africa on the factors contributing to occupational injury is inconsistent and not inclusive. Therefore, this review was aimed to estimate the pooled effect of factors contributing to occupational injury among workers in the industries.

**Methods:** The review followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The used databases included Scopus, PubMed/Medline, Science Direct, and Cochrane Library. Further, a modified version of the Newcastle-Ottawa Quality Assessment was used for the critical appraisal of studies. The pooled effect size of the studies was computed using STATA version 14 statistical software. The heterogeneity of the study was assessed using the I-squared values test, and the Galbraith plot. Considering within and between studies variability, the random-effect model was used to determine the pooled effect size. Funnel plot and egger's tests were conducted to evaluate publication bias.

**Results:** Out of 603 accessed studies, 20 studies that fulfilled the eligibility criteria were included. Being temporary employment workers (pooled odds ratio= 2.13 (1.06, 3.21)), not receiving ongoing health and safety training (pooled odds ratio= 1.98 (1.21, 2.76), and consistent use of personal protective equipment (pooled odds ratio= 0.60 (0.32, 0.88) were factors significantly associated with the odds of experiencing injury.

**Conclusion:** Being temporary employment workers and not receiving ongoing health and safety training elevates the odds of sustaining occupational injuries. Whereas, consistent use of personal protective equipment reduces the odds of experiencing injury. Hence, the stakeholders should implement rigorous law enforcement to ensure implementation of safety measures practices.

**Keywords:** Personal Protective Equipment, Pooled Odds Ratio, Temporary Employment, Health and Safety Training.

### **Length of First Stage of Spontaneous Labour and Factors Affecting Labour Progress among Women Who Gave Birth in Public Hospitals, Addis Ababa, Ethiopia: A Retrospective Cohort Study.** *Awraris Hailu Bilchut, Fikre Seife<sup>1</sup>, Awraris Hailu Bilchut<sup>2\*</sup>*

<sup>1</sup> National NTD Program team leader, FMOH, disease prevention and control directorate, Ethiopia

<sup>2</sup> Department of public health, College of health science, Debre Berhan University, Debre Berhan, Ethiopia.

**Background:** Prolonged labor causes mental torture and physical morbidity which most of the time leads to surgical intervention and may produce permanent anxiety and revulsion reflected by the mother. It may also endanger the life of the mother and the fetus. In Ethiopia, it is estimated to be 18%. However, the cause of prolonged spontaneous labour is not well documented in Ethiopia.

**Objective:** To determine the length of the first stage of labour and its associated factors among mothers who gave birth spontaneously in public hospitals of Addis Ababa.

**Method:** A facility-based retrospective cohort study was done in four randomly selected public hospitals in Addis Ababa. Four public hospitals were selected randomly from public hospitals in Addis Ababa. About 329 samples were included in the study and Kaplan –Meier, Cox - proportional hazard model and log-rank tests were applied for data analysis.

**Result:** A total of 329 maternal cards were reviewed and from this 99 (30%) of the mothers were nulliparous and 230 (70%) were multiparous. The duration of the first stage of labour among mothers whose hemoglobin level was less than 11g/dl was 16.21 hours but it was 11.40 hours for mothers whose hemoglobin level was greater than or equal to 11g/dl ( $p<0.0005$ ). The length of the first stage of labour for newborn weight less than 2.5k.g was 9 hours, for the newborn weight from 2.5k.g to 4k.g was 12.8hours and it was 16 hours for new born weight greater than 4 K.g ( $p<0.0005$ ). Artificial rupture of membrane had longer duration of the first stage of labour compared to a naturally ruptured membrane which was 14.7 hours and 10.7 hours respectively. And the median time was 10 hours for naturally ruptured membrane and 15 hours for artificially ruptured membrane ( $p<0.0005$ ). The mean duration of the first stage of labour for nulliparous women was 15 hours and it was 11 hours for multiparous women.

**Conclusion and recommendation:** The first stage of labour progress is slower than the widely accepted labour progress which is 1cm cervical dilatation per hour. The length of both the latent and active phase of the first stage of labour will be determined by first-time childbirth, anemia during pregnancy, gestational age at birth and artificial rupture of membrane. Therefore antenatal and delivery care services should consider these risk factors.

**Trend and Determinants of Quality of Family Planning Counseling In Ethiopia: Evidence from Repeated Pma Cross-Sectional Surveys, (2014-2019).** *Bedilu Alamirie Ejigu, Assefa Seme, Linnea Zimmerman, Solomon Shiferaw*

The modern contraceptive prevalence rate (mCPR) among married women has increased by nearly five-fold in Ethiopia from 8.1% in 2000 to 37% in 2019. Despite this increase, receipt of high-quality contraceptive counselling, as measured by the percentage of contraceptive users who were told about other methods, counseled on side effects and counseled what to do in the event that they encountered side effects, has declined in recent years. The effects of potential client and service provider-level factors on receipt of high-quality counseling and its progress over time have not been well studied in Ethiopia. We pooled data from seven Performance Monitoring for Action (PMA), formerly PMA2020, survey-rounds to examine the trend and effect of potential factors on receiving high quality of family planning counseling service in Ethiopia. Data from a total of 15,597 women aged 15-49 from seven survey-rounds were used in the analysis. To account for the study design and unequal probabilities of selection from target-populations for sampled women, design-based analysis was used to compute proportions. Multilevel ordinal regression model with enumeration area as a second level were employed to examine potential factors associated with quality of family planning counseling service. We found that the percentage of women who received high family planning counseling service declined since 2015 from 39% (95%CI: 33%, 44%) to 12% in 2019 (95% CI: 10%, 14%) nationally. Amhara region had the lowest percentage of women receiving high quality counseling at both the earliest (2014) and latest (2019) survey rounds (17% and 6%, respectively). Results show that lack of media exposure about family planning, having no formal education, using short-acting methods, and getting the service from pharmacy were the main determinant factors associated with receiving low quality family planning counseling service. Given the importance of continuous provision of information on the range of family planning methods, it is imperative to use media particularly regional media which can effectively address the rural populations in local languages as an important vehicle of information on family planning. Interventions aimed at improving quality of family planning counseling need to be mindful of the regional disparities in the severity of the problem to ensure equity in service access. To improve the coverage of high family planning counseling service, there is an urgent need to re-visit the format of family planning counselling service based on the result of this and other similar studies.

**Women Empowerment and its Effect on Fertility: Evidence from the Ethiopian Demographic and Health Survey.** *Tesfay Birhane Gebre Mariam, Mitke Molla, Wubegzier Mekonnen*

**Background:** Ethiopia is a country of high fertility with a strong ambition to reduce it to replacement level. Beyond the structural factors, women empowerment is also an important factor variable in determining fertility behavior. However, most fertility differential studies in Ethiopia focus on the proximal and structural determinants ignoring the gender dynamics of fertility. As a result, evidence on level of women empowerment and its impact on fertility control in Ethiopian is limited.

**Objectives:** The main objective of this study is to determine the empowerment status of married women and its association with the number of children ever born in Ethiopia.

**Methods:** this study is based on analysis of 15,683 women sample of the 2016 Ethiopian Demographic and Health Survey. To identify the dimensions of women empowerment, 29 variables of women empowerment were selected for explanatory factor analysis using Stata. The analysis identified seven factors with an acceptable Cronbach's alpha value of 0.65 from 27 variables with factor loading ranging from 0.4 to 0.94 and Cronbach's alpha of above 0.84. Then zero inflated negative binomial regression (ZINB) model was fitted to see the relationship between women empowerment and children ever born.

**Result:** few percentages (10.6%-18%) of women make independent decisions on domestic affairs while majority (70.6%) of them participated in jointly decision making. Two-third (63.6%) of women in Ethiopia justified wife beating at least for one reason. The mean number of Children Ever Born (CEB) for married Ethiopian women is 3.96. The complete fertility rate (number of CEB for women age 40-49) is found to be 6.4. Exploratory factor analysis revealed that women's decision making, attitude to wife beating, social status, assets ownership, age at first marriage and first birth, access to health care and sexual autonomy were significant domains of women empowerment. The ZINB revealed that women with better social status (AIRR=0.71, 95% CI=0.62-0.82), women having sexual autonomy (AIRR=0.81, 95%CI=0.7-0.89), and women's higher age at critical life events (AIRR=0.75, 95%CI=0.68, 0.8) have low number of CEB while women with better economic asset (AIRR=1.15, 95%CI=1.1-1.2) have significantly higher number of CEB. Decision making, attitude to wife beating and access to health care have no significant association. After controlling for other socio-economic variables (residence, region, wealth index, and religion), lower educational status of women, women's ownership of land, non-participation of husband in household chores, starting child birth before age of 20 years, and lack of women's decision-making power for their first marriage significantly increase the number of CEB in Ethiopia.

**Conclusion:** The total number of children ever born in Ethiopia is lower among women with better education, women who start child birth at later age, and women who decide on their first marriage. On the other hand, it increased with women's ownership of house and land. Fertility reduction programs should better invest on advancement of women's educational status and delaying age at child birth.

**Key Words:** *Autonomy, women status, fertility*



### **Task Shifting to Improve the Quality of ANC Using Mobile Ultrasound.** *Abebe Kassa Gebeyehu*

Background: Reducing maternal and neonatal mortality are global public health priorities, yet progress on these goals remains intractably slow. Evidence showed that the major causes of maternal and neonatal death in the low-income country accounted for poor-quality of care than non-utilization of care [1]. Quality of care requires the provision of effective, timely, and safe health service, delivered by a well-trained and motivated workforce, in a facility equipped with essential infrastructure and supplies [2]. One of the major neglected health system challenges to maternal and child health is the lack of access to ultrasound in the lower level of health care facilities. Ultrasound accessibility is critical for all aspects of safe maternal care, including quality ANC service. Lack of ultrasound may hinder providers' ability to manage complications/abnormality and cause them to delay necessary care action, poor quality of ANC service, and client satisfaction, putting mothers and infants at risk. Frequent blackouts may also create stressful working conditions for health care workers, generate client mistrust, and promote inequities in maternal care.

In response to the problem, the KOICA-funded integrated MNCH project being implemented by the Good Neighbors (GNE) International in partnership with Pathfinder International -Ethiopia aimed to contribute the national initiatives towards ending preventable maternal, neonatal, and childhood deaths by tackling the critical barriers using the three delays model. Improving healthcare-seeking behavior at the household and community level through various SBC strategies and approaches such as designing, printing, and distribution of IEC materials at household and health facilities including Family Health Guide, supporting pregnant women conference, engaging adolescent, and youth in the peer education program to **tackle the first delay**. Improving the client referral system, supporting the ambulance operation and construction, and furnishing of maternity waiting home to **tackle the second delay**. Improving the health facility readiness through a range of capacity enhancement training for health care providers including Health Extension workers, provision of need-based medical supplies and equipment including mobile ultrasound to **tackle the third delay**. The intervention started as a learning phase in November 2020 in five woredas of Arsi Zone, Oromia region.

### **Objectives**

- To transfer skill through task shifting
- To improve the quality of ANC care

### **Strategies for Intervention implementations**

Conducted facility gap assessment with the collaboration of Arsi University. In response to the finding and based on the major reasons for low ANC and poor quality of ANC service identified, the project revised its assumption and proposed to investigate an intervention that could have a pronounced effect by shifting the task and improving the quality of ANC service. Accordingly, with the collaboration of General Electric company and the Ethiopian Radiologist association, we provided 12 days of basic training for Midwives drawn from 20 Health centers, purchased LOGIQ V2 (Mobile Ultrasound machines), and distributed them to each health center. To ensure the consistent and appropriate use of the Mobil ultrasound machine, we provided three rounds of hands-on mentorship training with practical attachment sessions; created a telegram channel to provide remote mentorship by sharing pictures and videos guided by the senior radiologist as a complement to hands-on sessions; and

provided continues orientation on the available Ultrasound service and its benefit during the project supported pregnant women conference.

## **Results:**

**Availability of trained providers and ultrasound machines:** From November 23-December 4, 2020, the project provided basic training for 30 Midwives and purchased 20 Mobile Ultrasound machines and distributed them. Mobile ultrasound machine service was available for 20 health centers. Moreover, in addition to basic training, the project provides hands-on mentorship, orientation, and remote guidance.

**Utilization of mobile ultrasound machine:** In six months only (May 1, 2021, to the end of November 2021) a total of **5,337** pregnant women were screened with LOGIQ V2 ultrasonography during ANC visits, and a total of **375** different abnormalities are detected in twenty health centers. The major abnormalities detected are placenta previa, anencephaly, polyhydramnios, Intrauterine Fetal Death (IUID), Spinal Bifida, twin pregnancy, Hydrocephaly, and Abnormal presentation, varying from woreda to woreda.

Such early detection by the midlevel health care providers at the health center level has improved the quality of ANC and client satisfaction. Health care providers' confidence and motivation is also increased based on the feedback during site visits and quarterly performance review meetings.

## **Challenges:**

- COVID-19 affected the second hands-on mentorship training and delayed it by at least 2 months from the initial plan
- Lack of electricity source in some health centers and frequent interruption
- Complementing the capacity enhancement training and efforts with such task shifting material support leads to linked and comprehensive services thereby improving client satisfaction and health care providers motivation
- Coaching and mentoring by high-level experts improved the skills and performance of the participants that resulting 93.3% (28/30) success rate during final grading and certification
- Online remote mentorship using the telegram channel was also helpful in complementing g the hands-on coaching and mentorship
- A mobile ultrasound machine is basic for the pregnant women for better ANC services in detecting abnormalities early for timely referral thereby improving the pregnancy outcomes

## **Lesson learned:**

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**Magnitude of Optimal Antenatal Care Utilization and Its Associated Factors in South Gondar Zone, Northwest Ethiopia: A Cross-Sectional Study.** Setegn Muche Fenta

**Background:** Adequate antenatal care is critical for the mother's health as well as the development of the unborn baby. The WHO recommends at least four antenatal care (ANC) visits during a pregnancy. Only 32% of women of reproductive age in Ethiopia attend at least four ANC visits. This figure is significantly lower than the average for least developed countries. This study aimed to calculate the magnitude and identify associated factors with optimal antenatal care utilization in South Gondar Zone, Northwest Ethiopia. Method: A cross-sectional study was carried out in the South Gondar Zone of Northwest Ethiopia from September 2020 to May 2021. A total of 434 study participants were selected using a multistage cluster sampling technique. Data were gathered through face-to-face interviews using a structured questionnaire. A multivariable binary logistic regression model was used to identify factors associated with optimal antenatal care utilization.

**Result:** The magnitude of optimal antenatal care utilization was 59% (95%CI; 54.20, 63.65). The study showed that mothers who completed their secondary school (AOR = 8.205; 95% CI: 3.406, 19.767) and women who completed their tertiary school (AOR = 6.406; 95% CI: 2.229, 18.416), husbands whose level of education is secondary school (AOR = 5.967; 95%CI: 2.753, 12.936) planned pregnancy (AOR = 1.912; 95% CI: 1.117, 3.271), wanted pregnancy (AOR = 2.341; 95% CI: 1.366, 4.009), and husbands who work in the government or non-government sector (AOR = 3.736; 95%CI: 2.093, 6.669), not being exposed to the media (AOR = 0.520; 95%CI: 0.345, 0.783) and rural women (AOR = 0.267; 95%CI: 0.164, 0.435) were significantly associated with optimal ANC utilization.

**Conclusion:** The findings suggest that more emphasis be placed on education-based programs for women and their husbands that highlight the benefits of planned pregnancy, desired pregnancy, and maternal health care. Meanwhile, the government and other concerned bodies should focus on expanding road accessibility, health institutions, and ambulance distribution, which could improve optimal ANC utilization in the area.

**Extent of Received Antenatal Care Components in Ethiopia: A Community-Based Panel Study.** *kasiye shiferaw Gemechu*

**Purpose:** This study aimed to identify the extent of antenatal care content received and associated factors among Ethiopian women.

**Methods:** A nationally representative Performance Monitoring for Action 2020 Ethiopian data was used. A multistage cluster sampling design was used to select 2861 pregnant or recently postpartum women nested within 217 enumeration areas. Female resident enumerators collected the data using a semi-structured questionnaire. Researchers dichotomized the number of ANC content received greater than or equal to 75 percentiles as adequate. Otherwise, it was considered inadequate. A multilevel poisson regression was fitted. The result was reported using an incidence rate ratio with a 95% confidence interval and a p-value less than 0.05 was considered for statistical significance.

**Results:** The study revealed more than a quarter of pregnant women received adequate ANC content (27.8%; 95% CI: 23.8%, 32.2%). Multivariable analysis revealed urban residence (IRR = 1.09, 95% CI: 1.01, 1.21), attending secondary and above formal education (IRR = 1.08, 95% CI: 1.01, 1.16), maternal age 20–24 years (IRR = 1.10, 95% CI: 1.02, 1.19), and partner's encouragement to attend clinic for antenatal care (IRR = 1.14, 95% CI: 1.05, 1.24) was significantly associated with receiving higher numbers of antenatal care content.

**Conclusions:** The proportion of women who received adequate antenatal care content in Ethiopia was low. Despite Ethiopia's effort to improve maternal health services utilization, disparities among regions and between rural and urban exists. This study highlights the importance of ensuring high received antenatal care content, which is crucial for reducing pregnancy-related morbidity and mortality. This implies prompt intersect oral collaboration to promote female education, target older aged women, and rural resident women, encourage partner involvements during the antenatal care process, minimize regional variation, and strengthen the implementation of received ANC content policies and programs with the active participation of the stakeholders are priority issues.

### **Metabolic Syndrome among Working Adults in Eastern Ethiopia.** *Aboma Motuma Abdi*

**Purpose:** Metabolic syndrome (MetS) has become a public health challenge in low-income countries due to changing lifestyle and the food environment. However, studies on the prevalence of metabolic syndrome and associated factors are limited in Ethiopia. Therefore, this study assessed the prevalence of MetS and its associated factors among working adults in Eastern Ethiopia.

**Methods:** A cross-sectional study was conducted involving 1164 working adults from December 2018 to February 2019. Data were collected following the World Health Organization (WHO) STEPwise approach. The data collection tools include structured questionnaire, anthropometric, and biochemical measurements. Prevalence was calculated using International Diabetes Federation criteria. A Poisson regression model with robust variance estimation was used to investigate the independent variable's association with MetS. An adjusted prevalence ratio with 95% confidence interval was reported to show associations.

**Results:** The prevalence of MetS was 20.1% (95% CI: 17.8, 22.4) among the participants. It was more prevalent among females (APR; 1.62, 95% CI: 1.31, 2.00), age groups of 35-44 years (APR; 3.14, 95% CI: 1.19, 8.28), 45-54 years of age (APR; 4.42, 95% CI: 1.66, 11.77) and 55-64 years of age (APR; 6.03, 95% CI: 2.27, 16.06), khat chewers (APR; 1.30, 95% CI: 1.06, 1.60), those with 8 or more hours of sedentary behavior (APR; 2.29, 95% CI: 1.88, 2.80), and those consuming alcohol 5-6 days per week (APR; 1.81, 95% CI: 1.20, 2.74). The prevalence was significantly lower in those eating five or more fruits and vegetables servings per day (APR; 0.04, 95% CI: 0.01, 0.27).

**Conclusion:** High prevalence of MetS was observed among working adults in eastern Ethiopia. Strengthening workplace health promotion programs is necessary to reduce the negative consequences of MetS in workplaces and protect productivity.

**Progress towards Sustainable Development Goal for Non-Communicable Disease in Africa from 2010-2019; a Systemic Analysis for Global Burden of Disease Study.** *Dr. Atalel Fentahun Awedew*

**Background:** Non-communicable disease is major global public health concerns and challenges in 21<sup>st</sup> century which have been contributed significant burden of morbidity, mortality, disability and quality of life.

**Objective:** To provide Progress towards Sustainable Development Goal for Non-Communicable Disease in Africa from 2010-2019

**Methods:** We used Global Burden of Disease, Injury and Risk factors (GBD) study data source, analytic method and tools of GBD2019. We estimated the incidence, mortality, disability-adjusted life-years (DALYs) and trends of non-communicable disease in Africa and 54 countries from 2010-2019

**Results:** In 2019, there were 2.3 billion (95%UI: 2.1-2.4) incident cases, 3.8 million (95%UI: 3.4-4.2) deaths, and 204million (95%UI: 176-234) DALYs counts of non-communicable disease (NCD) in Africa. Between 2010-2019, incidence cases, deaths and DALYs counts of NCD in Africa were increased significantly by 26% (25-26%), 20 % (11-30%), and 19 % (11-28%) respectively. There were decreased age-standardised rate of deaths and DALYs by 5.8% (-11.4-0.4%) and 5.1 % (-10.1-0) respectively, with slight stable change in age-standardised incident rate of NCD from 2010 to 2019. In 2019, the leading causes of NCD related mortality in Africa were cardiovascular disease 1.61million (1.44-1.78), Neoplasm 0.66million (0.58-0.74million) and, Digestive diseases 0.42million (0.36-0.48)

**Conclusion:** Observation from this study informs that there are some progress and improvement in prevention and management of NCDs in Africa.

**Key words:** Africa, NCDs, Non-communicable disease

**Anemia as a Predictor of Physical functioning, Daily activity, Hospitalization and Mortality among Elders.** *Mulugeta Akilu Zewdie<sup>1</sup>, Katja Hätönen, Marianne Cuéllar, Marie-Fidèle Muremba, Van Doan*

<sup>1</sup> *Biostatistician and Lecturer Debreberhan , Email: muliesat2004@gmail.com*

**Introduction:** Anemia is a condition in which the number of red cells is insufficient to meet body's physiological needs. According to WHO Hb level less than 130g/l in men and Hb level, less than 120 g/l in women considered as anemic people. In many finding the incidence and prevalence of anemia increase with age increment, those this research finding focused on elders.

**Objectives:** The objective was to assess how anemia is associated with daily activity, physical functioning, nutritional status, hospitalization and mortality in the elders.

**Research Methods:** A prospective, population based cohort study of elders aged 80 years and older in Belgium with 5 years follow up period and cross-sectional assessment of the cohort at baseline and after 2 years was used. Descriptive statistics are presented in the form of mean  $\pm$  standard deviation (SD) or median with inter-quartile range [IQR(P25-P75)], mean differences between anemic and non-anemic elders were compared using student's t-test and association by chi-square test. Multiple linear regression used to assess the relationship of anemia with physical functioning (PTT) and activity of daily living (ADL), and also; Kaplan Meier curves were used to visualize the survival of anemic and non-anemic elders and cox proportional hazard models were used to investigate the hazards.

**Results:** A total of 567 elders were included in the cohort, among them 111 were anemic and 440 were non-anemic. Anemia was significantly predicted PTT [ $\beta$ (95%CI)=-0.97 (-1.76, 0.18);  $p=0.016$ ], and ADL [ $\beta$ (95%CI)=-1.79 (-2.85, -0.75);  $p=0.001$ ], Nutritional Status of elderly and PTT have positive association. After adjustment for age, gender, BMI, Mini Nutritional Assessment (MNA) score, and creatinine, elders with anemia have reduced PTT score by 0.97 as compared to non-anemic. After adjustment for age, gender, creatinine levels, and mini mental state examination (MMSE), elders with anemic reduce ADL score by 1.79 compared to non-anemic. After adjustment for age, gender, creatinine levels, and MMSE, a significant association was found between anemia and greater risk of mortality (1.41 times higher death occurrence in anemic elder as compared to non-anemic) [HR (95% CI) =1.41(1.04, 1.92);  $p=0.02$ ]. We found that elders with anemia had a significantly (logrank test  $p=0.001$ ) higher risk of mortality and hospitalization compared with non-anemic elders.

**Conclusions:** Anemia is a risk factor of Mortality and Hospitalization in elders and it is associated with decreased physical performance, decline in daily living, and increased number of hospital admissions and Mortality. Those it should be taken into account in regular physical assessments of the elderly and should be evaluated as a risk factor of hospitalization, mortality, activity of daily living and physical functioning decline.

**Keywords:** Anemia, Hospitalization, Mortality **Preferred Mode of Presentation: Poster or 3 Minute oral**

**Effects of a Culturally Tailored Self-Management Education and Support Programmer on Quality Of Life and Family Support Behavior among Adults Living With Type 2 Diabetes Family Dyads: A Pilot Randomized Controlled Trial.** *Dereje Chala Diriba*

**Background:** Diabetes is becoming a global threat, and currently, more than half a billion diabetes cases are recorded around the globe with 1.9 million adults in Ethiopia. The results of meta-analyses showed diabetes self-management interventions were not effective for Africans. This study aimed to estimate the preliminary effects of the community-based diabetes self-management education and support (DSMES) program on diabetes quality of life (DQOL) and family support behavior among adults living with type 2 diabetes-family dyads in western Ethiopia.

**Methods:** The trial protocol can be available on <https://doi.org/10.1111/dme.14587>. A parallel pilot RCT study was conducted from January to September 2021. Seventy-six dyads of people living with type 2 diabetes and their primary family caregivers were recruited and allocated either to the intervention group to receive the 12 h culturally tailored DSMES on top of usual care or the control group to continue the usual care. The patient's DQOL was assessed at baseline (T0) and follow-up at 4-month (T2); and family support behavior of caregivers was assessed at T0, post-intervention (T1), and T2. The intention-to-treat principle was applied. Generalized Estimating Equations (GEE) were conducted to examine the interventional effect.

**Results:** The GEE indicated that a significant a larger improvement in DQOL was obtained at 2-month follow-up ( $\beta = -0.833$ ,  $p < 0.001$ ,  $d = 0.87$ ) in the intervention group than the control group. The family caregiver's supportive behavior was significantly largely increased at both T1 ( $\beta = 2.734$ ,  $p = 0.020$ ,  $d = 0.58$ ), and T2 ( $\beta = 7.087$ ,  $p < 0.001$ ,  $d = 0.97$ ) in the intervention group. A significant increment in the family caregiver's non-supportive behavior was obtained at T2 ( $\beta = 6.361$ ,  $p < 0.001$ ,  $d = 0.43$ ); however, a non-significant rise was found at T1 ( $\beta = 2.342$ ,  $p = 0.056$ ,  $d = 0.91$ ) in the intervention group than control group.

**Conclusion:** The preliminary data showed the DSMES program was effective to improve DQOL and family support behavior among patient-caregiver dyads.



## Nutrition and Food Science

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### **Effect of Behavior Change Communication Through Health Development Army on Nutritional Status of Pregnant Women in Ambo District, Ethiopia: A Cluster Randomized Controlled Community Trial.** *Mitsiwat Abebe Gebremichael*

**Background:** Pregnancy is a critical phase in a woman's life, when mother's nutrition at conception and throughout pregnancy plays a key role in determining her health as well as that of her child. Therefore, the objective of the study was to investigate the effect of Behavior Change and Communication (BCC) through women development Army on nutritional status of pregnant women.

**Methods:** A cluster randomized controlled community trial (CRCCT) with baseline and end line measurements using quantitative data collection methods was conducted in Ambo district among 750 pregnant women aged 18-49 years (375 of control and 375 of intervention groups). Of which endpoint data were collected from 372 intervention and 372 control groups, respectively. The intervention was started from 12-16 weeks of gestation and pregnant women in the intervention group attended 6 counseling sessions. The intervention was started in July, 2018 and data collection for end line was started in October, 2018.

Descriptive statistics, chi-square test, bivariate and lastly multivariate binary logistic regressions analysis was used. Statistical analyses were conducted primarily on intention-to-treat (ITT) basis and p value <0.05 was used to declare statistical significance.

**Result:** After the intervention, undernutrition was lower in the intervention group compared with the control arm (12%% VS 25%,  $P < 0.0001$ ). Women in the intervention group showed significant improvement in nutritional status at the end of the trial than the control group (AOR=1.848, 95%CI: 1.171-2.918,  $p = 0.008$ ).

**Conclusions:** This study revealed that Behavior Change Communication (BCC) through women development army is effective in improving nutritional status of pregnant women. Therefore, to improve nutritional status of pregnant women, BCC through health development Army is recommended. The trial was registered in the Pan African Clinical Trial Registry: unique identification number for the registry is (PACTR201805003366358).

**Keywords:** Nutritional status, Behavior change communication, pregnant women, Ambo, Ethiopia

**Incidence and Predictors of Death among Children With Severe Acute Malnutrition in Amhara Region, Northwest Ethiopia: Shared Frailty Regression Model.** *Haileab Fekadu Wolde*

**Introduction:** Severe Acute Malnutrition (SAM) is the third leading cause of mortality among under-five children in Ethiopia and more than a quarter of the deaths occur during admission. Though a local based data that could improve inpatient treatment for SAM is important, there is limited information on the incidence and the predictors of under-five mortality associated with SAM. Therefore, this study aimed to determine the time to death and its predictors among SAM children admitted at Amhara region health facilities.

**Methods:** A retrospective record review was conducted from September 2012 to November 2016 in four selected health facilities of Amhara region. A total of 1,690 patient charts were reviewed. Kaplan Meier survival curve and log-rank test was estimated for each categorical variable. Shared frailty survival model with Gompertz distribution and gamma frailty was fitted. Model goodness of fit was checked using the cox-snell residual test. A p-value <0.05 was used in the multivariable model to declare a statistical significance. Hazard Ratio (HR) with its 95% confidence interval (CI) was computed to show the strength and direction of the association.

**Result:** The overall median follow-up period was 14 days (Inter Quartile Range (IQR) = 8-23) and the median time to death was 8 (IQR= 3-21) days. At the end of the follow-up, 196(11.6%), of the children were died giving the overall incidence density of 19.6 per 100 person-month of follow up (95% CI: 17.1%, 22.6%). HIV infection(AHR= 2.95, 95%CI: 1.58, 5.48), no antibiotics administration (AHR= 2.98, 95%CI: 1.58, 5.48), heart failure(AHR= 2.28, 95%CI: 1.25, 4.16), marasmic kwashiorkor (AHR= 2.48, 95%CI: 1.44, 4.29), no folic acid (AHR= 1.93, 95%CI: 1.11, 3.35) and no vitamin A supplementation (AHR=2.05, 95%CI: 1.25, 3.38) were the predictors of death.

**Conclusion:** The mortality rate among under-five children was higher than the minimum SPHERE standard. HIV infection, mixed form of under nutrition (marasmic-kuashiorkor), heart failure, not taking vitamin A, folic acid and antibiotics have increased the risk of mortality. Thus, treating co-morbidities and supplementing the children with essential supplements would be helpful to reduce their risk of mortality and improve their recovery from SAM.

**Key words:** severe acute malnutrition, Amhara region, under-five.

**Effect of Nutrition Education on Iodine Deficiency Disorders and Iodized Salt Intake in South West Ethiopian Women: A Cluster Randomized Controlled Trial.** Agize Asfaw

**Background:** Although iodine nutrition status is improving globally, the progress is not uniform throughout the world due to several factors. Among these, poor knowledge, negative attitude and improper practice of iodized salt are the main risk factors for poor iodine nutrition status in Ethiopia. This study was aimed to assess the effect of nutrition education intervention on knowledge, attitude and practice (KAP) of iodine deficiency and iodized salt utilization in southern Ethiopian Women.

**Methods:** A cluster randomized controlled trial was carried out among 652 women of reproductive age group in southwest Ethiopia. A total of 24 clusters were selected and randomized in to an intervention and control villages. Women in the intervention village received iodine nutrition related education for six months; while those in the control village did not receive any education. Baseline and end line data were collected from both groups. Generalized Estimating Equations (GEE) was used to determine the effect of intervention.

**Results:** A total of 647 (99.2%) participants were successfully involved in the study. In the intervention group the median attendance was 10 out of 12 sessions. Women in the intervention group had shown statistically significant change in knowledge, attitude and practice scores as compared to control one. In multivariable GEE linear model, after adjusting for background characteristics, the mean difference (95% CI) scores were 8.81 (8.46, 9.16) for knowledge, 3.35 (3.17, 3.54) for attitude and 2.90 (2.74, 3.05) for practice in the intervention arm.

**Conclusions:** Well designed and community-based iodine nutrition education is an effective strategy to improve the KAP of iodine deficiency disorders and iodized salt utilization.

**Trial registration:** PACTR201809544276357 (Registered on 14, Sept. 2018).

**Major Dietary Patterns and Their Predictors among Pregnant Women Attending Public Health Facilities in Eastern Ethiopia.** *Abdu Oumer Abdu, Mihret Abraham, Aliya Nuri*

**Background:** Pregnancy is one of the most critical periods where poor dietary intake imposes adverse consequences on maternal and newborn health. Dietary pattern analysis is a more robust statistical procedure to efficiently assess the dietary intakes of individuals. However, there is a lack of robust dietary intake evidence beyond nutrient intake in Ethiopia.

**Objectives:** To identify the major dietary patterns and predictors among pregnant women attending public health facilities in eastern Ethiopia.

**Methods:** This is a facility-based cross-sectional study among 380 randomly selected pregnant women attending public health facilities using a contextualized food frequency questionnaire to collect food intake over a period of one month. The frequency of food consumption was standardized to daily frequency equivalents, and a sequential factor analysis was used to derive the major dietary patterns. Factor scores for major dietary patterns were generated under the Bartlett method and ranked in three. A multivariable ordinary logistic regression model was fitted with all its assumptions. Crude and adjusted odds ratios with 95% confidence levels and p-values are reported. Statistical significance is declared at a p-value below 0.05.

**Results:** Three major dietary patterns ("fruits and animal-source foods", "cereals, tubers, and sweet foods", "legumes and vegetables"), explaining 65% of the total variation in dietary intake, were identified. Women with a habit of snacking (AOR=1.93; 1.23, 2.75), without food aversion (AOR=1.59; 1.08-2.35), non-fasting (AOR=0.75; 1.12-2.12), and receiving nutritional counseling (AOR=1.96; 1.25-3.07) were significantly positively associated with a higher tercile of fruits and animal-source food consumption. Non-working mothers (AOR=1.8; 1.23-2.76), those with a chronic disease (AOR=1.88; 1.14-3.09), or those who received nutritional counseling (AOR=1.33; 0.88-2.01), fasting mothers (AOR=1.33; 0.88-2.01), and those who didn't have food cravings (AOR=4.27; 2.67-6.84), and aversion (AOR=1.60; 1.04-2.44) had significantly higher odds of consuming cereals, tubers, and sweet foods. Literacy (AOR=1.87; 1.14-3.09), living in an urban area (AOR=2.10; 1.10-3.93), low socioeconomic class (OR=2.68; 1.30-5.23), and skipping meals (AOR=1.73; 1.15-2.62) were all significantly associated with higher odds of legume and vegetable consumption.

**Conclusions:** Three major dietary patterns were identified. Socioeconomic class, literacy, occupation, getting nutritional counseling, habits of food craving, food aversion, and fasting can predict a woman's dietary pattern.

**Effect of Nutrition Education Intervention during Pregnancy through Male Involvement on the Birth Weight of Babies in Southwest Ethiopia. A Community Based Quasi-Experimental Study.** *Dereje Tsegaye<sup>1\*</sup>, Dessalegn Tamiru<sup>1</sup>, Tefera Belachew<sup>1</sup>*

**Background:** Low birth weight is one of the most serious public health issues affecting newborns, with estimates ranging from 15% to 20% of all births worldwide. According to the Ethiopian demographic health survey report, the prevalence of LBW has risen from 11% in 2011 to 13% in 2016.

This study aimed to assess the effect of theory-based nutrition education during pregnancy through male involvement in on birth weight in rural parts of southwest of Ethiopia.

**Study design:** A community-based quasi-experimental study was conducted.

**Methods:** A total of 403 pregnant women were selected from 22 rural kebeles of Illu Aba Bor Zone, Southwest Ethiopia from June to December 2019. The intervention group received nutrition education for three sessions, whereas the control group received the usual care. An interviewer administered structured questionnaire was used to collect the data. Birth weight was measured within 48 hours of birth. Effect of the intervention on birth weight was assessed by a one-way ANOVA, linear mixed-effects model, and mediation analysis.

**Results:** A higher proportion of the newborns in the control group had low birth weight as compared to the couple group and the women alone group (18.1% vs 7.0% vs 11.5%,  $p = 0.037$ ) respectively. The mean birth weight of babies born to women from the couple group was 0.42 kg greater than that of newborns born to women in the comparison group (3.34 vs 2.92 kg,  $p < 0.001$ ). The linear mixed effect model showed that the average birth weight in the couple group was 0.40 kg higher than that of the control group ( $\beta=0.400$ ,  $P<0.001$ ). The direct effect of the intervention on birth weight among the couple group was 0.23 ( $\beta=0.227$ ,  $P<0.001$ ) whereas the indirect effect mediated by maternal dietary diversity practice was 0.17 ( $\beta=0.174$ ,  $P<0.001$ ), accounting for 43.5% of the total effect of the intervention.

**Conclusion:** The involvement of males and the application of the theory of planned behavior in nutrition education interventions during pregnancy resulted in improved birth weight. The findings highlight the implication of improving pregnant women's nutrition education through male involvement and the application of theories to improve birth weight.

**Key words:** - Birth weight, nutrition education, Intervention, pregnancy

**Individual And Community-Level Factors Associated with Animal Source Food Consumption among Children aged 6-23 months in Ethiopia: Multilevel Mixed Effects Logistic Regression Model.** *Abdu Oumer Abdu*

**Background:** Diversified diet in childhood has an irreplaceable role for optimal growth. However, multi-level factors related to low animal source food consumption among children were poorly understood in Ethiopia, where such evidence is needed for decision making.

**Objectives:** To investigate the magnitude and multi-layered predictors of animal source food (ASF) consumption among children aged 6-23 months in Ethiopia.

**Methods:** We utilized cross-sectional pooled data from 2016/19 Ethiopia Demographic and Health Surveys. A stratified two-stage cluster design was employed to select households with weights were applied to account for complex sample design. We fitted mixed-effects logit regression models on 4,423 children nested within 645 clusters. The fixed effect models were fitted and expressed as adjusted odds ratios with their 95% confidence intervals and measures of variation were explained by intra-class correlation coefficients, median odds ratio, and proportional change in variance. The deviance information criterion and Akaike information Criterion were used as model fitness criteria.

**Result:** in Ethiopia, only 22.7% (20.5%-23.9%) of children aged 6-23 months consumed ASF. Younger children aged 6-8 months (AOR=3.1; 95%CI: 2.4-4.1), home-delivered children (AOR=1.8; 1.4-2.3), from low socioeconomic class (AOR=2.43; 1.7-3.5); low educational level of mothers (AOR=1.9; 95%CI: 1.48-2.45) and children from multiple risk pregnancy were significant predictors of low animal source consumption at the individual level. While children from high community poverty levels (AOR=1.53; 1.2-1.95); rural residence (AOR=2.2; 95%CI: 1.7-2.8) and pastoralist areas (AOR=5.4; 3.4-8.5) significantly predict animal source food consumption at the community level. About 38% of the variation of ASF consumption is explained by the combined predictors at the individual and community level while 17.8% of the variation is attributed to differences between clusters.

**Conclusions:** ASF consumption among children is low, which is determined by the combined effects of individual- and community-level factors, which can be used for targeting and policy decisions.

**Key words:** animal source food consumption; multilevel mixed-effects logistic regression; factors; children; Ethiopia; Ethiopian Demographic and Health Survey

**Infants' Birth Weight and Its Association with Maternal Iron Status in Eastern Ethiopia: Prospective Cohort Study.** *Meseret Belete Fite*

**Introduction:** Low birth weight is one of the major predictor of perinatal survival, infant morbidity, and mortality, as well as the risk of developmental disabilities and illnesses in future lives. The effect of nutritional status of pregnant women on birth outcomes is becoming a common research agenda, but evidence on the association of prenatal iron status and birth weight in Ethiopia, particularly among rural residents is limited. This study aimed to assess infants' birth weight and its association with maternal iron status in Haramaya District.

**Methods:** A community-based prospective cohort study design was conducted. Four hundred twelve women were strictly followed until birth and birth weight were measured within 72 hours after birth. A Poisson regression model with robust variance estimation and linear regression analyses were used to investigate the association of the independent variables with the birth weight. An adjusted prevalence ratio with a 95% confidence interval was reported to show an association using a p-value <0.05.

**Results:** About 20.2% (95% CI:16%-24%) of infants were born with low birth weight. The prevalence of low birth weight was 5.04 (95% CI=2.778-9.143) times higher among women who were iron deficient during pregnancy compared to those who were normal. The newborns of women who were iron deficient during pregnancy had on average 524.73 g lower birth weight (95% CI= -616.83 to -432.63) than the newborns of women who were normal. The prevalence of low birth weight was 1.72 (95% CI=1.185-2.501) times higher among women who were undernourished, 1.55 (95% CI=1.056-2.271) times higher among those who were stunted (height<145cm). Female babies were 1.92 (95% CI=2.417-2.6.361) times prone to low birth weight.

**Conclusion:** We found low birth weight is of public health significance in this predominantly rural setting. Iron deficiency during pregnancy is found to have negative effect on birth weight. The maternal under-nutrition, height and sex of babies were identified as predictors of low weight at birth. Intervention strategies which are complementary and comprehensive across the vulnerable periods for women during pregnancy and their infants that are based on a life-cycle approach are suggested.

**Keywords:** Iron, Iron deficiency anemia, Anemia, Birth, Wight, Birth cohort

**Double and Triple Burdens of Malnutrition among Child-Mother Pairs in Ethiopia: Spatial and Survey Regression Analysis.** *Bethelihem Tigabu Tarekegn, Nega Tezera Assimamaw, Kendalem Asmare Atalell, Selam Fisiha Kassa, Addis Bilal Muhye, Masresha Asmare Techane, Tewodros Getaneh Alemu, Chalachew Adugna Wubneh, Getaneh Mulualem Belay, Tadesse Tarik Tamir, Destaye Guadie Kassie, Amare Wondim, Bewuketu Terefe, Mohammed Seid Ali, Beletech Fentie, Almaz Tefera Gonete, Berhan Tekeba, Bogale Kassahun Desta, Melkamu Tilahun Dessie, Amare Demsie Ayele*

**Background:** Evidences on double and triple burdens of malnutrition at household level among child-mother pairs is a key towards addressing the problem of malnutrition. In Ethiopia, studies on the double and triple burdens of malnutrition are scarce. Even though, there is a study on the double burden of malnutrition at national level in Ethiopia it has limitations. It doesn't assess the triple burdens at all and a few forms of the double burden of malnutrition among child-mother pairs. Therefore, this study aimed to determine the prevalence and associated factors of double burden and triple burden of malnutrition among child-mother pairs in Ethiopia.

**Methods:** A total sample of 7,624 child-mother pairs from the Ethiopian Demographic and Health Survey 2016 were included in the study. All analysis were performed considering complex sampling design. Anthropometric measurements and hemoglobin levels of children and anthropometric measurements of their mothers were considered primarily to compute double burden of malnutrition (DBM) and triple burden of malnutrition (TBM). Spatial analysis was applied to detect geographic variation of prevalence of double and triple burdens of malnutrition among EDHS clusters. Bivariable and multivariable binary survey binary logistic regression models were used to assess the factors associated with DBM and TBM.

**Results:** The overall weighted prevalence of DBM and TBM respectively were 1.8% (95%CI: 1.38-2.24) and 1.2% (95%CI: 0.83-1.57) among pairs of a child-mother in Ethiopia. Significant clusters of high prevalence of DBM and TBM were identified. In the adjusted multivariable survey logistic regression models, middle household economic status [AOR=0.23, 95%CI: 0.06, 0.89] as compared to the poor, average birth weight [AOR=0.26, 95%CI: 0.09, 0.80] as compared to large birth weight and children aged 24-35 months [AOR=0.19, 95%CI: 0.04,0.95] as compared to 6-12 months were less likely to experience DBM. Average birth weight [AOR=0.26, 95%CI: 0.09, 0.80] as compared to large birth weight and children aged 24-35 months [AOR=0.19, 95%CI: 0.04,0.95] as compared to 6-12 months were less likely to experience TBM.

**Conclusion:** There is low prevalence of DBM and TBM among child-mother pairs in Ethiopia. However, interventions tailored on geographic areas, wealth index, birth weight and child birth could help to control the emerging DBM and TBM at household level among child-mother pairs in Ethiopia.



## Health Literacy and Health Behaviors

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### **COVID-19 Vaccine Acceptance Rate and Its Predictors in Ethiopia: A Systematic Review and Meta-Analysis.** *Getaneh Mulualem Belay*

**Introduction:** Coronavirus disease (COVID-19) is a global pandemic and an infectious disease caused by the SARS-CoV-2 virus. To prevent this critical diseases, COVID-19 vaccine is the best strategy. However, unwillingness to receive this vaccine is the main challenges to prevent this pandemic. Therefore, this systematic review and meta-analysis aimed to determine the overall pooled estimate of COVID-19 vaccine acceptance and its predictors in Ethiopia.

**Methods:** We have searched all potential articles from electronic databases including, PubMed, EMBASE, Web of Science, and Google Scholar, On top of that, the reference lists of included studies and papers from the Ethiopian institutional research repositories were used. Searching of articles was limited to the studies conducted in Ethiopia. We have included observational studies including, cohort, cross-sectional and case-control. To compute the overall pooled proportion of COVID-19 vaccine acceptance, the weighted inverse variance random effects model was employed. The overall variations between studies were checked through the heterogeneity test ( $I^2$ ). Subgroup analysis by region and study participants was conducted. The Joana Briggs Institute (JBI) quality appraisal criteria has been used in order to assess the quality of included studies and the publication bias was checked with the funnel plot and Egger's regression test.

**Result:** In this study, a total of 14 studies with 6,013 participants were incorporated. Consequently, the overall pooled proportion of COVID-19 vaccine acceptance was 51.22% (95%CI: 43.93, 58.50). Sub group analysis by region indicated 50.39% (95% CI: 40.37, 60.42) in Amhara region which was a bit higher that of South nation, nationalities and peoples of regional state (49.91%; 95% CI: 38.20, 61.62). In addition, subgroup analysis by study participants revealed that COVID-19 vaccine acceptance is slightly higher in health workers (51.91%; 95% CI: 39.36, 64.47) than other occupations (50.82%; 95% CI: 41.39, 60.26). Having good knowledge about vaccine (Odds ratio: 2.73; 95% CI: 1.05, 7.10), having chronic disease (Odds ratio: 2.03; 95% CI: 1.34, 3.06), older age (Odds ratio: 1.84; 95% CI: 1.12, 3.02), and secondary education and above (Odds ratio: 3.33; 95% CI: 1.65, 6.71) were significantly associated with the acceptance of COVID-19 vaccine.

**Conclusion:** About half of the participants hesitate to receive the COVID-19 vaccine. Having good knowledge, chronic diseases, older age, and secondary education and above increased the acceptance rate of COVID-19 vaccine. Therefore, special attention better to given to adults, un educated segments of the population and strengthened awareness, education and training about COVID-19 vaccine benefit and adverse effects clearly.

**Keywords:** Ethiopia; COVID-19; Vaccine; Acceptance; Willingness

**COVID-19 Vaccine Perception, Willingness to Take And, Experience among Jimma Town Community, Oromia, Ethiopia: A Mixed Study Design.** *Daba Abdissa*

**Background:** COVID-19 has had a detrimental influence on people's health, caused economic upheaval, and left profound. The most successful technique for controlling its spread and aftermaths is to vaccinate the entire population, but the vaccine has been hampered by skepticism. The study was aimed to assess the community's perception of the COVID-19 vaccine, experience, and willingness to take it.

**Methods:** A community-based quantitative study triangulated with the qualitative method was conducted from 1<sup>st</sup> -30<sup>th</sup> April 2021. A semi-structured questionnaire addressing background information, COVID-19 perception, and the experience was administered to 422 community members. Qualitative data were collected from ten community members using an open-ended interview guide. SPSS 26.0 and ATLAS.ti 7.1 software were used for data analysis. COVID-19 perception items were computed, and a score of three-fourth from the possible maximum score was used as a cutting point for poor and good perception. Descriptive statistics were used to describe the findings. Multivariate logistic regression was performed to identify predictor variables. The adjusted odds ratio (AOR) with 95% CI and *p*-value of less than 0.05 were taken to declare statistically significant determinants of vaccine acceptance.

**Results:** Only about 35% had a good perception of the COVID-19 vaccine from the total study subjects. More than half (56.6%) of study subjects had a willingness to take the vaccine. Living with a family size of  $\geq 5$  with an adjusted odds ratio of 2.4 [95% CI, 0.985-86], living with under 18, or over 65 years individuals with an adjusted odds ratio of 2.3 [95% CI, 1.47-3.6], having a chronic illness with an adjusted odds ratio of 2.22 [95% CI, 1.33-3.7], and having a good perception of COVID-19 vaccine with an adjusted odds ratio of 1.8 [95% CI, 1.17-2.77] were significantly associated with COVID-19 vaccine acceptance (*P* < 0.005). Furthermore, vaccination hesitancy stemmed from a lack of belief in the existence of the COVID-19 disease, mistrust of the vaccine, and a preference for alternate forms of protection.

**Conclusion:** Although the majority of study participants had a poor impression of the COVID-19 vaccination, more than half of them want to have it. Lack of access, fear of side effects, and unfounded claims regarding the COVID-19 disease and its vaccination are all reasons why people haven't yet had the vaccine. To tackle this issue, it is necessary to give thorough and systematic health education on the COVID-19 disease and its vaccine.

**Keywords:** COVID-19 vaccine, perception, acceptance, Ethiopia

**Health Communication Materials Utilization in Providing Health Education among Health Professionals in Gondar City: Cross-Sectional Study.** *Simegnaw Handebo Berassa*

**Background:** Health communication affects people's decision making to protect and promote health. Well-designed health communication materials with tailored messages have the potential to impact social norms and behaviors that lead to a healthier society.

**Objective:** This study aimed to assess IEC materials utilization practice among health professionals in Gondar city Northwest Ethiopia.

**Methods:** An institution-based cross-sectional study was conducted in Gondar city. A total of 309 randomly selected health professionals were included in the study. A structured self-administered questionnaire was used for data collection. A multivariable logistic regression analysis was fitted to identify significant factors associated with health communication materials utilization. A p-value of less than 0.05 and a 95% confidence interval were used to declare statistical significance.

**Results:** A total of 298 health professionals participated in the study with a response rate of 96.4%. The median age of the participants was 30 years. Two third (67.5%, 95% CI: (61.9%, 72.6%)) of the total study participant were ever used IEC materials. Being midwifery (AOR= 0.31; 95% CI: 0.11, 0.85) and laboratory (AOR= 0.31; 95% CI: 0.10, 0.93) professional, working at health center (AOR=3.60, 95% CI: 1.52, 8.54), not delivering health education (AOR=0.09, 95% CI: 0.04, 0.21), availability of IEC materials (AOR=2.23, 95% CI: 1.10, 4.53), and having good knowledge about IEC materials (AOR=2.69, 95% CI: 1.36, 5.32) were significantly associated factors with health communication materials utilization.

**Conclusion:** Two-third of health professionals in Gondar city ever utilized health communication materials. Health professional's IEC materials utilization is critical in delivering tailored health messages to promote pro-health attitudes and behaviors. Improving the development and distribution of standardized health communication materials, harmonizing health communication activities, and building the capacity of health professionals need to be emphasized at all level of health promotion initiatives.

**Keywords:** Health communication, IEC materials utilization, Health professionals, Ethiopia.

**Adherence to Preventive Behaviors and Associated Factors towards COVID 19 among Adults in Gurage Zone Ethiopia, 2020.** *Abebaw Wasie Kasahun*

**Introduction:** Corona virus disease (COVID19) is caused by severe acute respiratory syndrome virus 2 (SARS-COV-2). The disease is first notified to World Health Organization by the Chinese government as “Outbreak of pneumonia” (later named COVID 19 by WHO) in Wuhan city on December 31 2019. Then, it spreads fast out of China to almost all countries in the world; as a result, World Health Organization declares COVID 19 outbreak as Public Health Emergency of International Concern on January 30 and declares it as global pandemic on March 11, 2020. The pandemic poses complex and multifaceted crises in the world. Its effect is not limited to overwhelming the health system and bringing high toll of direct mortality and morbidity but it ravages global economy and social interactions too.

There is no drug effective to treat COVID 19 to date. The only available effective option is prevention and control of infection. People’s engagement on preventive practices is fundamental and recommended for adherence. Therefore, this study was aimed to assess Preventive practice and its associated factors towards Covid 19 among adults in Gurage zone, Ethiopia.

**Methods:** Community based cross sectional study was conducted to assess preventive practices and associated factors towards COVID 19 among adults in Gurage zone. The study is designed based on constructs of health belief model. The study involved 398 study participants. Multi-stage sampling technique was employed to recruit study participants. Data were collected using interviewer administered close ended structured questionnaire. Data were entered using epi Data3.2 and was exported to SPSS version 21 for analysis. Binary and multivariable logistic regression was used to identify independent predictors of the outcome variable.

**Results:** Majority of respondents (73.1%) reportedly practice of at least one recommended preventive behaviors of COVID 19. Only (17.7%) respondents have reportedly adherent to all recommended preventive behaviors but none of respondents were 100% adherent to 16 preventive practices of COVID 19. Residence AOR= 3.42{95% CI, 1.6-7.31}, marital status AOR ={95%CI, 0.33{0.15-0.71}}, knowledge on absence/presence of vaccine for COVID 19 AOR =0.45{95% CI,{0.21-0.95}} and self-rated level of knowledge as poor AOR= 7.96{95%CI, {2.42-26.2}} and self-rated level of knowledge as not bad AOR 5.5(95% CI, {2.50-12.08}} were significantly associated with social distancing practice.

**Conclusion:** Adherence to recommended preventive behaviors for COVID 19 were very low and affected by residence, marital status, knowledge on vaccine presence and self-rated level of knowledge with social distancing.

**Key words:** COVID 19, preventive behaviors

**Prenatal Alcohol Consumption And Risk Of Anemia Among Pregnant Women Attending Antenatal Care At Public Health Facilities In Gondar Town, Northwest Ethiopia: A Retrospective Cohort Study.** *Alemu Earsido Addila, Telake Azale, Yigzaw Kebede Gete, Mezgebu Yitayal*

**Background:** Alcohol consumption during pregnancy can lead to multiple health, social and, behavioral problems for both the mother and the offspring. Anemia is one of the major public health concerns and causes of morbidity and mortality among pregnant women with poor maternal and fetal outcomes in developing countries. This study aimed to identify the link between prenatal alcohol consumption and anemia among pregnant women attending antenatal care at public health facilities in Gondar town, Northwest Ethiopia.

**Methods:** A facility-based retrospective cohort study was conducted among pregnant women who were booked for antenatal care in selected public health facilities from 29 October 2019 to 7 May 2020 in Gondar town. We used a two-stage random sampling technique to recruit and include study participants in the cohort. Data were collected using a standardized interviewer-administered questionnaire. Multivariable analysis was performed to examine the association between reported prenatal alcohol exposure (non-hazardous and hazardous) and anemia in pregnancy using log-binomial regression modeling. The burden of anemia in pregnancy was reported using the adjusted risk ratio and population-attributable risk (PAR).

**Results:** A total of 1669(1113 unexposed and 556 exposed) pregnant women were included in the analysis. The prevalence of anemia during pregnancy was 14.86% (95% CI: 13.23, 16.65). Hazardous alcohol consumption during pregnancy was significantly associated with anemia in pregnancy (adjusted RR= 2.24; 95% CI: 1.60, 3.15), whereas there was no enough evidence for a statistical association between anemia and non-hazardous alcohol consumption during pregnancy (adjusted RR= 1.03; 95% CI: 0.79, 1.36). The adjusted PAR of anemia in pregnancy related to hazardous alcohol consumption during pregnancy was 7.68%.

**Conclusions:** This study revealed that anemia during pregnancy continues to be a public health concern in Northwest Ethiopia. Regardless of timing, the clear association between prenatal hazardous alcohol consumption and increased risk of anemia during pregnancy suggests a need for targeted prenatal alcohol use and anemia screening, and ongoing intervention for alcoholic and anemic pregnant women.

**Keywords:** pregnant women; alcohol use; anemia; Ethiopia

## Health System

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### **Spatial Patterns and Inequalities in Skilled Birth Attendance and Caesarean Delivery in Sub-Saharan Africa.** *Firew Tekle Bobo*

**Background:** Improved access to and quality obstetric care in health facilities reduces maternal and neonatal morbidity and mortality. We examined spatial patterns, within-country wealth-related inequalities and predictors of inequality in skilled birth attendance and caesarean deliveries in sub-Saharan Africa.

**Methods:** We analysed the most recent Demographic and Health Survey (DHS) data from 25 sub-Saharan African countries. We used the concentration index (CCI) to measure within-country wealth-related inequality in skilled birth attendance and caesarean section. We fitted a multilevel Poisson regression model to identify predictors of inequality in having skilled attendant at birth and caesarean section.

**Results:** The rate of skilled birth attendance ranged from 24.3% in Chad to 96.7% in South Africa. The overall coverage of caesarean delivery was 5.4% (95% CI: 5.2% to 5.6%), ranging from 1.4% in Chad to 24.2% in South Africa. The overall wealth-related absolute inequality in having a skilled attendant at birth was extremely high, with a difference of 46.2 percentage points between the poorest quintile (44.4%) and the richest quintile (90.6%). In 10 out of 25 countries, the caesarean section rate was less than 1% among the poorest quintile, but the rate was more than 15% among the richest quintile in nine countries. Four or more antenatal care contacts, improved maternal education, higher household wealth status, and frequently listening to the radio increased the rates of having skilled attendant at birth and caesarean section. Women who reside in rural areas and those who have to travel long distances to access health facilities were less likely to have skilled attendant at birth or caesarean section.

**Conclusions:** There were significant within-country wealth-related inequalities in having skilled attendant at birth and caesarean delivery. Efforts to improve access to birth at the facility should begin in areas with low coverage and directly consider the needs and experiences of vulnerable populations.

**Cost-Effectiveness of Bedaquiline-Based Treatment for Extensively Drug-Resistant Tuberculosis in South Africa: A Model-Based Analysis.** *Ginenus Fekadu Mekonen*

**Background:** The treatment outcome of extensively drug-resistant tuberculosis (XDR-TB) with conventional anti-TB regimens was poor. Clinical findings reported improved treatment outcomes of XDR-TB with the bedaquiline (BDQ)-based regimens. We aimed to evaluate the cost-effectiveness of BDQ-based treatment for XDR-TB from the perspective of the South Africa national healthcare provider.

**Methods:** A 2-year decision-analytic model was designed to simulate clinical and economic outcomes of a hypothetical cohort of adult XDR-TB patients with (1) BDQ-based regimen and (2) injectable-based conventional regimen. The model inputs were retrieved from literature and public data. The primary model outputs included TB-related direct medical cost and disability-adjusted life-years (DALYs).

**Results:** In base-case analysis, the BDQ group reduced 4.4152 DALYs with incremental cost of USD768 when compared to the conventional group. The incremental cost-effectiveness ratio (ICER) of BDQ group was 174 USD/DALY averted. In probabilistic sensitivity analysis, the BDQ group was accepted as cost-effective in 98.36% of the 10,000 simulations at a willingness-to-pay threshold of 6,748 USD/DALY averted ( $1 \times$  gross domestic product per capita in South Africa).

**Conclusion:** The BDQ-based therapy appeared to be cost-effective and showed a high probability to be accepted as the preferred cost-effective option for active XDR-TB treatment.

**Keywords:** Bedaquiline-based regimen; conventional regimen; cost-effectiveness; extensively drug-resistant tuberculosis; high-burden; South Africa

## **Development of an Entrustable Professional Activities (Epa) Framework to Inform Surgical Residency Training Programs in Ethiopia: A Three-round National Delphi Method Study.**

*Ekulinet Misganaw Amare*

**Background:** Entrustable Professional Activities (EPAs) have been proposed as a means to translate competencies into clinical practice. Although EPAs for residency training have become available, 1 set of core EPAs cannot automatically be transferred from one context to another due to cultural variability. Further, there is a lack of African- and Asian-based EPA development and implementation studies. We developed an end-of-training EPAs framework to inform surgical residency training programs in the local context of Ethiopian medical education.

**Methods:** A three-round Delphi method was used to establish consensus about important surgical EPAs among experts. A total of 136 experts representing all surgical residency training institutions in Ethiopia were invited to participate. Round 1 & 2 consisted of senior expert panelists ( $n = 8$ ) to identify potential EPAs and determine the content validity. Round 3 consisted of a survey ( $n = 128$ ) to further validate the identified EPAs by attending surgeons who work with them. Each EPA had to achieve at least 80% or higher agreement among experts to be considered having acceptable content validity.

**Results:** In round 1, a total of 272 EPAs were proposed, reduced, and grouped to 39 consented EPAs. In round 2, The same experts rated each EPA's relevance, resulting in 32 EPAs with a satisfactory item-level content validity index ( $I-CVI > 0.83$ ). Overall, in the survey in round 3, 29 EPAs met the standard criterion for acceptability ( $S-CVI/Ave = 0.90$ ) and achieved a high degree of final consensus ( $ICC = 0.998$ , 95% CI [0.996, 0.999]; ( $F = 439.2$ ,  $p < 0.0001$ ).

**Conclusions:** The framework of 29 validated and accepted EPAs can guide future surgical residency training programs in the Ethiopian medical education context. The framework allows programs to move from a time-dependent to an outcome-based model and transforms traditional assessment into entrustment decisions. Thus, the use of the framework can improve the quality of training and patient care in Ethiopia.

**Amare EM**, Siebeck M, Sendekie TY, Fischer MR, Berndt M. Development of an Entrustable Professional Activities (EPA) Framework to Inform Surgical Residency Training Programs in Ethiopia: A Three-round National Delphi Method Study. *Journal of Surgical Education*. 2021 Jul 20



**Past Eight-Year Malaria Data in Gedeo Zone, Southern Ethiopia: Trend, Reporting-Quality, Spatiotemporal Distribution, And Association with Socio-Demographic and Meteorological Variables.** *Eshetu Molla Belete*

**Background:** Informed decision making is underlined by all tiers in the health system. Poor data record system coupled with under- (over)-reporting of malaria cases affects the country's malaria elimination activities. Thus, malaria data at health facilities and health offices are important particularly to monitor and evaluate the elimination progresses. This study was intended to assess overall reported malaria cases, reporting quality, spatiotemporal trends and factors associated in Gedeo zone, South Ethiopia.

**Methods:** Past 8 years retrospective data stored in 17 health centers and 5 district health offices in Gedeo Zone, South Ethiopia were extracted. Malaria cases data at each health center with sociodemographic information, between January 2012 and December 2019, were included. Meteorological data were obtained from the national meteorology agency of Ethiopia. The data were analyzed using Stata 13.

**Results:** A total of 485,414 suspected cases were examined for malaria during the previous 8 years at health centers. Of these suspects, 57,228 (11.79%) were confirmed malaria cases with an overall decline during the 8-year period. We noted that 3758 suspected cases and 467 confirmed malaria cases were not captured at the health offices. Based on the health centers records, the proportions of *Plasmodium falciparum* (49.74%) and *P. vivax* (47.59%) infection were nearly equivalent ( $p = 0.795$ ). The former was higher at low altitudes while the latter was higher at higher altitudes. The over 15 years of age group accounted for 11.47% of confirmed malaria cases ( $p < 0.001$ ). There was high spatiotemporal variation: the highest case record was during Belg (12.52%) and in Dilla town (18,150, 13.17%,  $p < 0.001$ ) which is located at low altitude. Monthly rainfall and minimum temperature exhibited strong associations with confirmed malaria cases.

**Conclusion:** A notable overall decline in malaria cases was observed during the eight-year period. Both *P. falciparum* and *P. vivax* were found at equivalent endemicity level; hence control measures should continue targeting both species. The noticed under reporting, the high malaria burden in urban settings, low altitudes and Belg season need spatiotemporal consideration by the elimination program. **Keywords:** Malaria, Retrospective, Data quality, Spatiotemporal trend, Meteorological factors, Gedeo zone

**An Evaluation of Health Extension Workers Role in Tuberculosis Case Finding: A Concurrent Mixed Method.** *Awraris Hailu Bilchut*

*Awraris Hailu Bilchut (MPH, PhD) , Peter Thomas Sandy (PhD)*

*Affiliation :Awraris Hailu; Debre Behan University, Health Sciences College.*

*Peter Thomas Sandy; University of South Africa.*

**Background:** Millions of Ethiopians, especially those who live in rural areas, are exposed to a variety of preventable diseases, including tuberculosis.

**Objective:** The purpose of this study was to evaluate the role of health extension workers in the case finding of tuberculosis in Ethiopia.

**Methods:** This study was underpinned by a concurrent mixed methods design. Three focus group interviews with 8 participants each, and two focus groups with 8 participants each were conducted with health extension and patients respectively. The quantitative data were collected using structured questionnaires from 1264 patients with tuberculosis from 80 health centres. The qualitative data were analysed using ATLAS/ti. The quantitative data were analysed using both descriptive and inferential statistics with the help of SPSS version 25.

**Findings:** The qualitative findings showed that the health extension workers' contribution to tuberculosis case finding was not adequate. The health extension workers attributed this to a number of factors, and examples include inadequate human resources and workload. With regard to the patients' views on the inadequate health extension workers' contribution to tuberculosis case finding, they reported that it was a function of distance to health centres, knowledge of tuberculosis, and lack of diagnostic equipment. The quantitative findings were consistent with that of the qualitative findings, as the former revealed a low contribution by health extension workers to tuberculosis case finding (11%).

**Conclusion:** The findings of this study call for a coordinated effort from all stakeholders (e.g. Ministry of health, health departments, and coordinators of health posts) to improve the health extension workers' contribution to tuberculosis case finding.

## **Understanding Multi-sectoral Collaboration for Strengthening Public Health Capacities in Ethiopia.** *Shivani Dama*

**Background:** Multisectoral collaboration is critical to capacity strengthening efforts for improved global health security, enabling stakeholders to achieve successes they may be unable to attain alone. While there has been some study of multisectoral collaboration, little is known about how it occurs for strengthening public health capacities in low-income settings, including factors influencing collaboration strength.

A multiple case study design was utilized to explore multisectoral collaboration in Ethiopia for strengthening public health capacities in two cases: public health emergency preparedness (PHEP) and zoonotic diseases (ZD).

Methods: Document analysis and in-depth interviews (IDIs) identified stakeholders for each of the cases and mapped stakeholder roles and responsibilities (Paper 1). IDIs also explored how collaboration occurs for public health capacity development and perceived collaboration barriers and facilitators (Paper 2). Finally, an expert panel review and IDI data were used to adapt a collaboration strength assessment tool for Ethiopia's context (Paper 3).

Results: 42 documents were reviewed for a preliminary understanding of multisectoral collaboration for public health capacity development in Ethiopia. Across PHEP and ZD, 39 individuals from 23 stakeholder organizations were interviewed. Ethiopian government stakeholders were viewed as leading capacity development approaches. Stakeholders perceived multisectoral collaboration as critical to capacity development efforts; platforms convening sectors for planning and implementing activities, such as the National One Health Steering Committee, were important collaboration facilitators. To strengthen collaboration, improved awareness and commitment to its importance is needed among decision-makers in the public health capacity development environment. Institutionalizing multisectoral collaboration can affirm political buy-in at the highest levels of country leadership and reinforce expectations that such collaboration efforts align with Ethiopia's priorities. Stakeholder organizations also need a common understanding of roles and responsibilities in collaboration efforts and strengthened communication for related activities and contributions. Addressing these gaps can improve accountability, sustainability, and trust for multisectoral collaboration efforts.

**Conclusion:** Research findings can improve understanding of how multisectoral collaboration occurs in Ethiopia for public health capacity development. This research also began the adaptation process for a collaboration assessment tool for Ethiopia's context. This tool can be further adapted to understand and improve collaboration in Ethiopia and other settings.

**Effective Coverage of Curative Child Health Services in Ethiopia? Tracking Progress towards Universal Health Coverage.** *Tsegaye Gebremedhin Haile, Anteneh Asefa, Alemnesh Mirkuzie, Lenka Benova*

**Introduction:** Despite remarkable decline, early childhood morbidity and mortality remains high and uneven in Ethiopia. With the current pace, the child health targets of the Sustainable Development Goal cannot be achieved unless further actions are not taken. This study estimates the effective coverage of curative child health services in Ethiopia which could be used to orient the implementation of high-impact child health interventions.

**Methods:** We analyzed data from the 2016 Demographic and Health Survey (DHS) and Service Provision Assessment plus (ESPA+) Survey (2014). We identified a total of 2,096 sick children under five years with one or more common childhood illnesses (diarrhoea, fever, and acute respiratory illnesses) from the DHS to measure the crude coverage of child health services. Additionally, we identified a total of 1076 health facilities, 1980 sick children under five years, 1908 mothers/caregivers and 5328 healthcare providers from the ESPA+ survey to measure the quality of child health services. We estimated quality of care indices using the Donabedian framework (structure, process, and outcome) and the weighted additive method was used for quality indices estimation. Finally, the crude coverage was adjusted for quality of services to estimate the effective coverage of curative child health services.

**Results:** A total of 890 (42.5%) children under five years were taken to the health facility for care during their course of illness. The weighted score of the structure was 30.0%, process 9.2%, and satisfaction (outcome) 15.2%, which resulted in a 54.4% (index of 0.544) of quality. After adjusting the crude coverage for the quality index, the estimated effective coverage of curative child health services was 23.1%.

**Conclusions:** A substantial proportion of sick children are not getting quality of care among those who need the services, that puts the country remotely towards the achievements of UHC. On the other hand, the services are provided inadequately particularly in the primary health care units. Therefore, the government of Ethiopia should do further action in strengthening the existing primary health care services.

**Keywords:** Effective coverage, crude coverage, quality, curative child health services, childhood illness, Ethiopia

**Child Vaccination in Sub-Saharan Africa: Increasing Coverage Addresses Inequalities** *Firew Tekle Bobo*

**Background:** Vaccines have substantially contributed to reducing morbidity and mortality among children, but inequality in coverage continues to persist. In this study, we aimed to examine inequalities in child vaccination coverage in sub-Saharan Africa.

**Methods:** We analyzed Demographic and Health Survey data in 25 sub-Saharan African countries. We defined full vaccination coverage as a child who received one dose of bacille Calmette-Guérin vaccine (BCG), three doses of diphtheria, pertussis, and tetanus vaccine (DTP 3), three oral polio vaccine doses (OPV 3), and one dose of measles vaccine. We used the concentration index (CCI) to measure wealth-related inequality in full vaccination, incomplete vaccination, and zero-dose children within and between countries. We fitted a multilevel regression model to identify predictors of inequality in receipts of full vaccination.

**Results:** Overall, 56.5% (95% CI: 55.7% to 57.3%) of children received full vaccination, 35.1% (34.4% to 35.7%) had incomplete vaccination, while 8.4% (95% CI: 8.0% to 8.8%) of children remained unvaccinated. Full vaccination coverage across the 25 sub-Saharan African countries ranged from 24% in Guinea to 93% in Rwanda. We found pro-rich inequality in full vaccination coverage in 23 countries, except for Gambia and Namibia, where we found pro-poor vaccination coverage. Countries with lower vaccination coverage had higher inequalities suggesting pro-rich coverage, while inequality in unvaccinated children was disproportionately concentrated among disadvantaged subgroups. Four or more antenatal care contacts, childbirth at health facility, improved maternal education, higher household wealth, and frequently listening to the radio increased vaccine uptake.

**Conclusions:** Continued efforts to improve access to vaccination services are required in sub-Saharan Africa. Improving vaccination coverage and reducing inequalities requires enhancing access to quality services that are accessible, affordable, and acceptable to all. Vaccination programs should target critical social determinants of health and address barriers to better maternal health-seeking behaviour.

**Keywords:** Vaccination, Immunisation, Socioeconomic factors, Inequality, Sub-Saharan Africa

**Delay in Making Decision to Seek Institutional Delivery Service Utilization and Associated Factors among Mothers Attending Public Health Facilities In Dawuro Zone.** *Terefe Dodicho Dosh*

**Background:** Delay in institutional delivery refers to the time interval from the first onset of labour to start to receiving first healthcare. Delay in deciding to seek care (first delay), identifying and reaching medical facility (second delay), and receiving adequate and appropriate treatment (third delay) are three major factors that contribute to maternal death in developing countries. The time interval from the first onset of labour to decision to seek emergency obstetric care from health facility and time longer than the expected time (one hour) is considered as first delay.

**Objective:** This study was aimed to investigate delay in deciding to seek institutional delivery care and associated factors among mothers attending public health facilities in Dawuro zone. Methods: Institution based cross-sectional study was employed from March 1-30, 2017. Consecutive sampling technique was used to interview mothers who presented to health facilities to receive delivery service. Data were collected using structured interviewer administered questionnaire. Results: Total of 394 mothers were participated in the study. One hundred sixty six [42%] of the study subjects were delayed in making decision to seek delivery service utilization from health facilities. A significant relationship was found between mother's residence in rural areas, mother's educational level primary and below, average monthly income of the family <1000 ETB & mother's antenatal care visit less than 4 times and first delay (maternal delay to seek institutional delivery care).

**Conclusion:** Significant number [42%] of mothers delayed in making decision to seek delivery service utilization from health facilities. Therefore, strategies to identify determinants of delay in making decision to seek institutional delivery service and enhance practices for further reduction in this delay is needed.

**Detection of blaKPC and blaNDM Carbapenemase Genes among *Klebsiella pneumoniae* Isolates in Addis Ababa, Ethiopia: Dominance of blaNDM.** *Tewachew Awoke, Brhanu Teka, Abraham Aseffa, Shemse Sebre, Aminu Seman, Biruk Yeshitela, Tamrat Abebe, Adane Mihret*

**Background:** Infections caused by *Klebsiella pneumoniae* have been difficult to control because of the worldwide emergence of carbapenem-resistant isolates mainly due to carbapenemase production. Information regarding carbapenemase-producing *K. pneumoniae* is still scarce in Ethiopia. Therefore, the current study aimed to determine the prevalence of carbapenemase-producing *K. pneumoniae* and to assess the occurrence of bla<sub>NDM</sub> and bla<sub>KPC</sub> carbapenemase genes.

**Methods:** A cross-sectional study was conducted from September 2018 to February 2019 at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia. A total of 132 non-duplicate *K. pneumoniae* isolates were studied. Phenotypic confirmation of carbapenemase production was done by modified Carbapenem Inactivation Method (mCIM). Multiplex PCR was performed for the detection of carbapenemase-encoding genes bla<sub>KPC</sub>, and bla<sub>NDM</sub> using specific primers for each. Data was double entered using Epidata 3.1 and exported to SPSS version 25 software for analysis. P-value less than 0.05 were considered as statistically significant.

**Results:** Out of the total 132 *K. pneumoniae* isolates, 39 (29.6%) were non-susceptible to one or more carbapenems. The prevalence of carbapenemase-producing isolates from the total was 28 (21.2%) with mCIM, of which the most dominant gene was bla<sub>NDM</sub> 26 (92.9%) and one isolate carried bla<sub>KPC</sub> concomitantly. Carbapenemase-producing *K. pneumoniae* isolates were 100% non-susceptible to half of the antimicrobials used in the study, including meropenem and ertapenem. Previous use of carbapenems was associated with carbapenemase production (P=0.004).

**Conclusions and Recommendations:** The prevalence of carbapenemase-producing *K. pneumoniae* isolates was worrying in the study area. To our knowledge, the study described the emergence of bla<sub>NDM</sub> and bla<sub>KPC</sub> gene carrying *K. pneumoniae* in Ethiopia for the first time. Further large-scale molecular-based studies, including other carbapenemase genes and sequencing of *K. pneumoniae* are warranted, to have a clear awareness about the presence of international clones in Ethiopia.

**Keywords:** Carbapenemase; KPC; NDM; *K. pneumoniae*; Ethiopia

**Lipid and Lipoprotein Profile in HIV-Infected and Non-Infected Diabetic Patients: A Comparative Cross-Sectional Study Design, Southwest Ethiopia.** *Shiferaw Bekele Woyesa*

**Background:** Lipoproteins are complexes of lipids and proteins that are essential for the transport of cholesterol, triglycerides, and fat-soluble vitamins. The linkage between chronic diseases like diabetes mellitus and HIV infection increases the complication of the diseases and worsens the clinical outcome of the patients.

**Purpose:** To assess and compare lipid and lipoprotein profiles among HIV-infected and non-infected diabetic patients, and to identify independent predictor variables for abnormal lipid and lipoprotein profiles.

**Patients and methods:** A comparative cross-sectional study design was used to carry out the research, and a convenient sampling technique was used to include 96 adult diabetic patients (48 HIV-infected and 48 non-infected diabetics). Socio-demographic and clinical data were collected by interviewer-administered questionnaire. Five milliliter blood sample was collected and processed for lipid and lipoprotein profile measurement. Multivariate and bivariate logistic regressions were used to identify independent predictor variables for abnormal lipid and lipoprotein profiles.

**Results:** The prevalence of diabetic dyslipidemia was 41.7% and 37.5% in HIV-infected and non-infected diabetic patients, respectively. Hypercholesterolemia was more commonly detected among HIV-infected diabetic patients than non-HIV-infected, 25.0% versus 18.8%, respectively. Similarly, hypertriglyceridemia was more commonly observed in HIV-infected (31.3%) than non-infected diabetic patients (20.8%). About 25.0% HIV-infected diabetic patients had combined hyperlipidemia (hypercholesterolemia plus hypertriglyceridemia); and about 4.2% had hypoalphalipoproteinemia or isolated low HDL-C. Being female and long duration of diabetes mellitus were independent predictor variables for abnormal lipid and lipoprotein profiles in HIV-infected patients. Similarly, being female and high blood pressure were independent predictor variables in non-HIV-infected diabetic patients.

**Conclusion:** High prevalence lipid and lipoprotein abnormalities were detected in HIV-infected diabetic patients even though the abnormalities were also common in non-HIV co-morbid diabetic patients. Hence, proactive screening and treatment of blood glucose, lipid, and lipoprotein abnormalities are critically important and should be part of comprehensive HIV care.



**High Occurrence of blaCTX-M, blaTEM, and blaSHV Genes among Klebsiella pneumoniae Isolates in a Large Tertiary Hospital in Ethiopia.** *Tewachew Awoke, Brhanu Teka, Aminu Seman, Shemse Sebre, Biruk Yeshitela, Abraham Aseffa, Tamrat Abebe, Adane Mihret*

**Background:** *Klebsiella pneumoniae* is among the most clinically relevant enterobacteria, being frequently reported as a cause of serious infections. It has many plasmids that harbor most of antibiotic resistant genes including extended-spectrum b-lactamases (ESBLs). Studies on ESBL producing *K. pneumoniae* are still scarce in Ethiopia. Therefore, the current study aimed to determine the magnitude and resistance patterns of ESBL producing *K. pneumoniae* as well as the frequency of bla<sub>CTX-M</sub>, bla<sub>TEM</sub>, and bla<sub>SHV</sub> genes.

**Methods:** This study was conducted from September 2018 to February 2019 at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. After the identification of *K. pneumoniae*, antimicrobial susceptibility testing was done by Kirby-Bauer disc diffusion technique. Phenotypic detection of ESBL production was done using Combined Disc Test. DNA was extracted using boiling lysis method and ESBL-encoding genes of bla<sub>CTX-M</sub>, bla<sub>TEM</sub>, and bla<sub>SHV</sub> were detected through multiplex PCR using specific primers for each. Data was double entered using EpiData 3.1 and exported to SPSS version 25 software for analysis.

**Results:** The magnitude of ESBL production was 102/132 (77.3%). ESBL positive isolates were 100% resistant to ceftriaxone, cefotaxime and cefuroxime. Co-resistance of ESBL positive isolates to other non b-lactam antimicrobials was high to trimethoprim-sulfamethoxazole (96.1%) followed by tetracycline (75.5%), gentamicin (73.5%), aztreonam (65.7%) and amoxicillin-clavulanate (54.9%). However, these isolates showed high susceptibility to amikacin (96.1%) and meropenem (89.2%). From the total ESBL positive isolates, 82.6%, 73.5%, and 75% carried bla<sub>CTX-M</sub>, bla<sub>TEM</sub>, and bla<sub>SHV</sub> genes respectively. The majority 78/102 (76.5%) of ESBL positive isolates harbored all three types of ESBL genes simultaneously.

**Conclusions and Recommendations:** The magnitude of ESBL producing *K. pneumoniae* isolates was very alarming in the study area. The co-occurrence of bla<sub>CTX-M</sub>, bla<sub>TEM</sub>, and bla<sub>SHV</sub> genes is high intensifying the problem. ESBL producing isolates showed high resistance to most of the antimicrobials. Therefore, phenotypic detection of ESBL production should be done in the hospital regularly for better management of patients and to monitor further progress in control of antimicrobial resistance.

**Keywords:** ESBL; CTX-M; TEM; SHV; *K. pneumoniae*; Ethiopia

## **Human Papillomavirus Genotype Distribution in Ethiopia; an Updated Systematic Review.**

*Awoke Derby, Daniel Mekonnen, Endalkachew Nibret, Melanie Maire, Yimtubezinash Woldeamanuel, Tamrat Abebe*

**Background:** Cervical cancer is the most common malignancy affecting women worldwide. Etiologically associated with infection by high-risk Human papillomaviruses (HR-HPVs), cervical cancer is one of the leading causes of cancer related deaths among Ethiopian women. To develop vaccination and HPV based cervical cancer screening approaches, data on genotype distribution of HPVs is vital. Hence, the study was aimed to review HPV genotype distribution in Ethiopia.

**Methods:** Research articles were systematically searched using comprehensive search strings from PubMed/Medline and SCOPUS. Besides, Google Scholar was searched manually for grey literatures. The last search was conducted on 18 Aug, 2021. The first two authors independently appraised the studies for scientific quality and extracted the data using Excel sheet. The pooled HPV genotype distribution was presented with descriptive statistics.

**Results:** We have included ten studies that were reported from different parts of the country during the period of 2005 and 2019. These studies included a total of 3,633 women presented with different kinds of cervical abnormalities, from whom, 29 different HPV genotypes with a total of 1,926 sequences were reported. The proportion of high-risk, possible/probable high-risk and low-risk HPVs were at 1493 (77.5%), 182 (9.4%) and 195 (10.1%), respectively. Of the reported genotypes, the top five were HPV 16 (37.3%; 95%CI: 35.2-39.5%), HPV 52 (6.8%; 95%CI: 5.8-8.0%), HPV 35 (4.8%; 95%CI: 3.9-5.8%), HPV 18 (4.4%; 95%CI: 3.5-5.3%) and HPV 56 (3.9%; 95%CI: 3.1-4.9%). Some of other HR-HPV groups include HPV 31 (3.8%), HPV 45 (3.5%), HPV 58 (3.1%), HPV 59 (2.3%), and HPV 68 (2.3%). Among the high-risk types, the combined prevalence of HPV 16/18 was at 53.7% (95%CI: 51.2-56.3%). HPV 11 (2.7%; 95%CI: 2.1-3.5%), HPV 42 (2.1%; 95%CI: 1.5-2.8%) and HPV 6 (2.1%; 95%CI: 1.4-2.7%) were the most common low-risk HPV types.

**Conclusions:** We noted that the proportion of HR-HPV types is higher and HPV 16 in particular, but also HPV 52 and 35, warrant special attention while devising vaccination and HPV based cervical screening programs in Ethiopia. Additional data from other parts of the country where there is no previous report are needed to better map the national HPV genotypes distribution in the country.

## Environmental Health

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**Household Air Pollution Impacts on Mortality and Disease Burden in East and Nile Basin African Countries: Implications of Grand Ethiopian Renaissance Dam.** *Awoke Misganaw<sup>1,2</sup>, Tezera Berheto<sup>1</sup>, Yihunie Lakew<sup>1</sup>, Sisay Derso Mengesha<sup>1</sup>, Mesfin Agachew<sup>1</sup>, Asrat Arja<sup>1</sup>, Wendwosen Teklemariam<sup>1</sup>, Ababi Zergaw<sup>1</sup>, Fentabil Getnet<sup>1</sup>, Alemnesh Hailemariam<sup>1</sup>*

<sup>1</sup> National Data Management Center (NDMC) for health, Ethiopian Public Health Institute, Ethiopia.

<sup>2</sup> Institute for Health Metrics and Evaluation, University of Washington, USA

**Background:** East and Nile basin (ENB) Africa covers 18 countries with a total population of 560 million encompassing Burundi, Comoros, Djibouti, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mozambique, Rwanda, Somalia, South Sudan, Sudan, Tanzania, Uganda, Zambia. The region has huge renewable energy potential which may help to address major public health challenges related to clean household energy access. To estimate the disease burden related to household energy and to inform progress on SDG 7 for clean energy we quantify exposure and health impacts of household air pollution from the use of solid fuels for cooking from 1990 to 2019

**Methods:** In all 18 countries, we estimated exposure to household air pollution from solid fuels (defined as the percentage of households using solid cooking fuels and the corresponding exposure to PM<sub>2.5</sub>). We applied the methods of the Global Burden of Diseases, injuries and Risk Factor Study 2019 to estimate deaths, premature mortality, and disability-adjusted life years (DALYs) attributable to household air pollution from solid fuels.

**Findings:** There was high prevalence of household air pollution from the use of solid fuels for cooking, ranging from 78% in Somalia to 0.02% in Egypt in 2019. In total, there were 346,600 deaths attributable to household air pollution from the use of solid fuels for cooking in ENB in 2019. The highest number of all-cause household air pollution (HAP) attributable death was in Ethiopia 67,830 (52,710-82,420), DR. Congo, 58,040 (41,170-77,460), Tanzania 39,170 (29,180-49,860) and Somalia 27,550 (19,570-38,960), and the lowest deaths was in Comoros 550 (410-710), Djibouti 20 (90-360) and Egypt 70 (30-170). Almost all deaths were due to respiratory infection, neonatal diseases and conditions, cardiovascular diseases, chronic respiratory disease and diabetes across all countries. Premature mortality and disability attributable to household air pollution from solid fuels were highly prevalent in Somalia, DR. Congo, Ethiopia, Tanzania and Uganda compared to Egypt. Though the trend of death rate per 100,000 populations attributable to household air pollution showed a decline in Ethiopia and all countries between 1990 and 2019, it was unacceptably high in Somalia (272 deaths), Burundi (186 deaths), DR. Congo (157 deaths), Eritrea (140 deaths), South Sudan (133 deaths) and Ethiopia (130 deaths) compared to Egypt (0 deaths).

**Conclusions:** Household air pollution (HAP) is highly prevalent and a major public health concern across ENB African countries. The prevalence and impact varies between countries. There is an important indication to benefit from regional partnership on sources of energy such as Grand Ethiopian Renaissance Dam (GERD); Egypt could share best practices and interventions to reduce HAP to the region. The findings also indicate ENB Africa countries are facing challenges to achieve SDG 7 to provide affordable and clean energy for their population. Countries need to address HAP in their disease prevention and control strategies of lower respiratory infection, neonatal, diabetes, chronic respiratory diseases and cardiovascular diseases.

**The Impact of Covid-19 Lockdowns on the Quality of PM (Particulate Matter) Pollution in Addis Ababa.** Dawit Siraw Workneh<sup>1\*</sup>, A. Kumie<sup>1</sup>, A. Worku<sup>1</sup>, B. Simane<sup>1</sup>, G. Boja<sup>1</sup>, W. Tefera<sup>1</sup>, M. Mekashaw<sup>1</sup>, Z. Tazu<sup>1</sup>, Y. Getachew<sup>1</sup>, S. Teklu<sup>1</sup>, J. M. Samet<sup>3</sup>, K. T. Berhane<sup>4</sup>; J. Patz<sup>5</sup>, K. Dessie<sup>2</sup>

<sup>1</sup>Addis Ababa University, Addis Ababa, ETHIOPIA, <sup>2</sup>University of Southern, California, CA, <sup>3</sup>University of Colorado, Colorado, CO, <sup>4</sup>Columbia University, New York, NY, <sup>5</sup>University of Wisconsin, Madison, WI, \* Corresponding Author (dawitsiraw33@yahoo.com)

**Background:** The COVID-19 outbreak has spread rapidly across the world and due to this country, all over the world have implemented a lockdown strategy to slow down the spread of the disease. Ethiopia has confirmed the first COVID-19 case on March 13, 2020, and since then to control the rapid dispersion of the virus, the country imposed partial lockdown policies from March 17, 2020. This has led to reduced human activities and the movement of vehicles in the city of Addis Ababa. The aim of this study is to investigate the air quality changes during the COVID-19 lockdowns, in Addis Ababa, Ethiopia.

**Methods:** Air pollution monitor known as Beta Attenuator Monitor (BAM-1022) has been used to measure the real-time PM<sub>2.5</sub> concentration. Three data sets were used for analysis; before COVID lockdown (Jan 1 to March 16, 2020), During lockdown (March 17-May 26, 2020), and after lockdown (May 27 to June 30, 2020).

**Results:** From our study, we have found that PM<sub>2.5</sub> emissions have been reduced significantly by 11% in March compared with the 2018 same month, 28% lower in April 2020 when compared with the same months of 2017-2018, by 22% lower in May 2020 and 23% lower in June when compared with same months of the year 2017– 2019. The independent sample t-test result did for the lockdown months (March to May) with the previous years of the same months shows a significant reduction ( $p < 0.05$ ). The lockdown period has a significant PM<sub>2.5</sub> reduction (13%) compared with before lockdown period and 41% reduction compared with after lockdown period. Again, the result was statistically supported and found significant ( $p < 0.05$ ).

**Conclusions and Recommendations:** Our results show that during the COVID-19 lockdown period, air quality improvement was seen. The most important reason for the reduction could be restriction measures taken on the movement of people and vehicles in the city as an epidemic prevention and control measures.

**Keywords:** air pollution, COVID -19, Lockdown, PM<sub>2.5</sub> concentration

## Traditional Medicine

Abs 49

### **Community Preference of Traditional Bone Setting and its Associated Factors in Karat Zuria District, Southern Ethiopia.** *Haregewoyin Kerebih Seneshaw*

<sup>1</sup>*Haregewoyin Kerebih, <sup>2</sup>Haymanot Nigussie, <sup>2</sup>Alehegn Bekele*

<sup>1</sup>*Debre Markos University, School of Medicine, department of biomedical Science*

<sup>2</sup>*Arba Minch University, College of medicine and Health Science*

**Introduction:** Traditional bone setting is one of the popular traditional medicines, which is recognized to have attained a level of success comparable to modern orthopedic medicine in developing countries. Even though traditional bone setting is widely utilized in developing countries including Ethiopia, there is limited information regarding the community preference of traditional bone setting and associated factors in our country particularly in Karat Zuria district.

**Objective:** To assess community preference of Traditional Bone Setting and its associated factors in Karat Zuria district, Southern Ethiopia, 2019.

**Methods:** A community based cross sectional study triangulated with qualitative phenomenological study design was conducted. For quantitative part a total of randomly selected 626 adult study participants were interviewed at house hold level from randomly selected six kebeles of Karat Zuria district. For qualitative part in-depth interview of traditional bone setter were conducted on seven traditional bone setters.

**Data analysis -** Quantitative data was coded and entered into Epi data version 3.5.1 and exported to SPSS Version 25 for analysis. A descriptive frequency was conducted for describing the study population in relation to relevant variables. Binary and multivariable logistic regression analysis was calculated to assess the crude association and significant association between dependent and independent variables. Finally adjusted odd ratio with 95% confidence interval was used to identify significant factors. The collected qualitative data was transcribed word by word and was translated in to English language and prepared as plain text form. Finally, the data was exported in to open code 3.2 for thematic analysis.

**Result** –The prevalence of community preference for management of fracture by traditional bone setter were 67.1%. The major reason of community preference traditional bone setter were easily accessible to their residence area, low cost or free service provision, the injury heals faster, and due to fear of amputation of fracture part by modern orthopedics surgery. Study participants who were rural residence AOR 1.93(1.2, 3.14), those who were farmer AOR 7.65(3.17, 18.50), knowing traditional bone setter residence AOR 2.22 (1.2, 4.00) and past history of treatment by traditional bone setter AOR 1.77(1.06, 2.98) were significant contributing factors for preference of traditional bone setter for fracture management.

**Conclusion-** Majority of community prefers traditional bone setter for fracture and dislocation management from all segment of the population. There was miss-link, communication and collaboration between traditional bone setter and health institution even though tradition medicine is one the component of primary health care and in Ethiopian health extension package.

**Key words** - traditional bone setter, Karat Zuria district, community prefers traditional

# **Poster Presentations**

## Conflict and Public Health

Abs 1

### **The Role of Social Cohesion on Resilience of Sexual Violence Survivors in Armed Conflict Areas in Ethiopia.** *Shirega Minuye Share*

**Background:** Ethiopia is engrossed with armed conflict particularly in Northern Ethiopia and some pockets of western Ethiopia for the last year. Consequently, several damages, massive forced displacement, loss lives and horrific brutality of sexual violence in women and girls have been occurred. Countries experience showed that sexual violence among women and girls during conflict is a deliberate tactic to humiliate, disempower and undermine the social cohesion of the invaded areas. Consequently, women including the old ones and girls who have faced sexual violence like the forms of barbaric gang rape are forced to live with physical and psychological trauma, social stigma and unwanted pregnancy. The children born of rape are also often ostracized and relegated to the masses of the society. Similarly, different reports issued by the government, non-government and medias concurrently asserted that brutal sexual violence happened among women and girls in conflict settings in Ethiopia. Though, exact number of sexual violence survivors are not yet known, it is estimated that there are a significant number. Therefore, there is a need to look for plausible solutions to ensure the resilience of sexual violence survivors.

**Objectives:** This study aims to make a rapid assessment on the forms of sexual violence happened, the situation of the sexual violence survivors, and efforts made to treat the sexual violence survivors and suggest the possible alternative solutions for the resilience of sexual violence survivors.

**Methods:** Secondary sources including reports, news briefs, news narrations based on sexual violence survivors' interviews, informal discussion with experts like psychologists/social workers, psychiatrists and other countries which have similar experiences documents were reviewed systematically in order to understand the realities and choose better modalities in response to the case for Ethiopia.

**Results:** The study results showed that there are a significant number of women including nuns, young girls and adult women faced gang rape, barbaric form of sexual exploitation, harassment, and physical violence. As a result, most are forced to live with untreated physical and psychological trauma. In fact, there are efforts underway with psycho-social treatment by volunteers from different learning institutions and government staff from health bureaus and other relevant offices. Although different countries which underwent similar experiences showed that enriching social cohesion at community and school level was found to be brought fruitful results in recovering sexual survivors, there is not yet social cohesion started so far in armed conflict areas in Ethiopia.

**Recommendation:** Considering the current situation of the sexual violence survivors in armed conflict areas in Ethiopia, there is a need to develop social cohesion tailored to adult women and girls at community and school level respectively in combination with psycho-social treatment for effective resilience of sexual violence survivors including their families.

## **Neonatal Survival in Complex Humanitarian Emergencies during Sars-Cov-2 Pandemic: Systematic Review** *Minyahil Tadesse Boltena*

**Background:** Fragile settings affected by complex humanitarian emergencies due to violence and conflict have the highest burden (42%) of neonatal mortality and morbidity globally. The emergence of SARS-Cov-2 pandemic stalled the neonatal health care delivery which already been hampered by the health system damaged by war and instability on these settings. There is lack of cutting-edge evidence to accurately inform the policy decision making to respond to the neonatal health crisis on complex humanitarian settings. Therefore, this systematic review aimed at synthesizing the current available evidence on neonatal survival in complex humanitarian emergency.

**Methods:** PubMed, Web of Science, Scopus, CINAHL, and Google Scholar databases were used to retrieve published and unpublished literature. No restrictions were made to the language. Literature covering COVID-19 available from 11 March 2020 to 31 December 2021 were included. The Joanna Briggs Institute's critical appraisal tool was used for quality assessment of included studies. The protocol has been registered on PROSPERO with registration number CRD42020192298.

**Result:** A total of 27 eligible studies reported neonatal health outcomes from 13 fragile states facing complex humanitarian emergency crisis. Neonates birth to mother in humanitarian need and internally displaced were infected by SARS-COV-2. 249 children aged 0-28 days died in humanitarian emergency situation from second week of March 2020 to last week of December 2021. Low-birth weight, small for gestation, and gross motor delay are the health outcomes reported from neonates born to mothers experiencing dire humanitarian conditions from conflict and SARS-Cov-2 pandemic.

**Conclusion:** Armed conflicts create enduring political instability and destabilize health systems that are in near collapse due to COVID-19 infection in fragile economic settings. Health systems in conflict affected settings must be protected to deliver primary health care for the women and children impacted by the direct and indirect harms of conflict, violence, and war with the resultant health system deterioration and worsening socioeconomic conditions due to the SARS-Cov-2 pandemic.

**Keywords:** COVID-19, Humanitarian emergency, Neonatal survival/mortality, SARS-Cov-2.



**Determinants of Low Birth Weight for Under Five-Children: The Case of Buno-Bede and Illu-Ababora Zones, Oromia Regional State, Ethiopia.** *Woldemariam Erkalu Gobena*

**Background:** The World Health Organization (WHO) defined low birth weight (LBW) as birth weight of less than 2500 grams at birth. Globally an estimated 13 million babies are born before 37 completed weeks of gestation. This figure is high among middle and low income countries.

**Objective:** The main objective of the study was identifying determinant factors of low birth weight for under-five children in Buno-Bede and Illu Aba Bora zones, Oromia Regional State, Ethiopia. **Methods:** One year retrospective cross sectional study was conducted from January, 2020 to September, 2020. The data were collected by health professionals and the investigators have strictly been followed the data quality. The collected data were analyzed by using STATA software version 13. From Marginal models, generalized estimating equation (GEE) and alternating logistic regression (ALR) models were used for the analysis of low birth weight data.

**Results:** Of the 1,386 children who were included in this study, 895 (64.6%) children were born with large weight whereas 491 (35.4%) were born with small weight. The proportion of LBW is slightly larger (19.04%) for male child than the female child (16.38%). ALR is chosen as the better model than GEE based on quasi likelihood criteria (QIC) which is the modified AIC (Akaike information criteria). The result of ALR reveals that child's sex, mother's age, mother's education status, BMI of mother, number of antenatal care visits, vaccination status and maternal anemia were significant factors of low birth weight whereas previous birth interval, birth order, marital status of mother and terminated pregnancy were not significant factors of low birth weight at 5% level of significance.

**Conclusion:** Finally, this study plays its crucial role on the understanding of the individual and collective effect of maternal, socio-economic and child related factors influencing infant birth weight. **Keywords:** low birth weight; under-five children; generalized estimating equation; alternating logistic regression.

## Epidemiology

Abs 4

### **A Bayesian Approach to Estimate the Probability of Resistance to Bedaquiline In The Presence of a Genomic Variant.** *Degefaye Zelalem Anlay Mail*

**Background:** Bedaquiline (BDQ) is a core drug for treatment of rifampicin-resistant tuberculosis. Due to sparse data, few genomic variants have been statistically associated with BDQ resistance. Alternative approaches for determining the genotypic-phenotypic association are needed to guide clinical care.

**Methods:** Using published genotype-phenotype data on 689 isolates and expert opinion on the probability of BDQ resistance in the presence of specific variants, we considered a Bayesian approach to estimate the probability of BDQ resistance and its corresponding 95% credible interval. More specifically, we rely on prior conjugacy for Rv0678 and atpE genes and MCMC sampling from the posterior distributions for pepQ and Rv1979c genes.

**Results:** Experts (n=33) agreed on the role of Rv0678 and atpE and synonymous mutations but opinions on the role pepQ and Rv1979c genes and other variant types play in BDQ resistance varied. Posterior mean estimates of the probability of resistance to BDQ deviated mostly from prior mean, derived based on expert opinion, in the sense that experts overestimated the likelihood that a specific variant confers phenotypic BDQ. Posterior mean for the probability of BDQ resistance varied by type of variant and gene affected and ranged from 2.4% to 94.9% for atpE variants, 2.3% to 90.3% for Rv0678 variants, 23.3% to 31.7% for pepQ variants and from 4.2 to 33.3% for Rv1979c variants, with wide 95% credible intervals due to limited data.

**Conclusion:** Bayesian estimates of the probability of resistance to BDQ given a specific mutation could be useful for clinical decision-making when sparse data problems hamper classification of variants as high confidence variants. Future studies should investigate the use of Bayesian probabilities for BDQ resistance in clinical practice.

**Keywords:** Bayesian, bedaquiline, genomic variant, resistance, probability

**Delayed Initiation of Antiretroviral Therapy (ART) and It's Associated Factors among People Living with HIV in Nekemte Specialized Hospital, Western Ethiopia.** *Ejigu Gebeye Zeleke ,Lami Bayisa, Abilo Tadesse, Mebratu Mitiku,*

*Contact Address E-mail: ejigugebeyezeleke@gmail.com, Phone: +251902744887*

*Affiliation: University of Gondar*

**Background:** Antiretroviral therapy is combination of drugs to treat HIV infection with intention of viral suppression. Current guideline recommends early ART initiation within 7 days of confirmed HIV diagnosis. Ethiopia has adopted test and treat strategy to its national policy. Despite availability of ART, a substantial number of people living with HIV are delay to start therapy.

**Objective:** To assess delayed initiation of ART and its associated factors among people living with HIV at Nekemte specialized hospital, Western Ethiopia.

**Methods:** An institution based cross-sectional study was conducted among people living with HIV attending ART at Nekemte Specialized Hospital from January to February 2020. A consecutive sampling technique was used to select 423 study participants. Interviewer administered pre-tested semi-structured questionnaire was used to collect data. Data was coded and entered into Epi-data 3.1 and exported to STATA 14.0. Bivariable and multivariable binary logistic regression analysis were done.

**Results:** A total of 423 participants were enrolled with response rate of 98.6%. The magnitude of delayed ART initiation was 33.8% [95%CI (29%–38%)]. Participants with TB/HIV co-infection (AOR=2.76; 95% CI 1.13, 6.70), visit traditional healer (AOR=4.03, 95% CI 2.03, 8), normal BMI (AOR=3.12, 95%CI 1.29, 7.57), and not know other ART users (AOR=2.86, 95%CI 1.52, 5.37) were significantly associated with delayed ART initiation. Delayed ART also explained by lack of ART knowledge (AOR=2.86, 95%CI 1.44, 4.63), not perceived severity (AOR=2.09, 95%CI 1.17, 3.73), lack of self-efficacy (AOR=2.05, 95%CI 1.14, 3.69), perceived barriers (AOR=2.35, 95%CI 1.31, 4.23), and CD4 >446cells/mm<sup>3</sup> (AOR=2.89, 95%CI 1.27, 6.58).

**Conclusion:** About one third of participants delayed ART and it is relatively low. Visit traditional healers, lack of ART knowledge, TB/HIV co-infection, not know other ART users, high CD4, and not perceived severity of ART delay were factors significantly associated with delay ART initiation.

**Keywords:** Antiretroviral Therapy, Delayed initiation, Ethiopia.

**Weight Change after Antiretroviral Therapy Initiation in Adults Living With Human Immunodeficiency Virus in Northwest Ethiopia: A Longitudinal Data Analysis.** *Animut Alebel<sup>1, 2\*</sup>, Daniel*

**Background:** Although longitudinal studies focused on individual body weight variability over time after initiating antiretroviral therapy (ART) among adults living with human immunodeficiency (HIV) are essential to inform treatment guidelines, such studies in Ethiopia are limited to the best of our knowledge. Thus, this study aimed to explore weight evolution over the first two years of ART in adults living with HIV.

**Methods:** An institution-based retrospective longitudinal study was conducted among 848 adults living with HIV receiving ART at Debre Markos Comprehensive Specialized Hospital, Northwest Ethiopia, between June 2014 and June 2020. Data from included participants were abstracted using a standardized data abstraction tool, adapted from ART entry and follow-up forms. A linear mixed-effect model (LMM) with random intercept and slope was employed. Variables with  $p \leq 0.25$  in the bivariate analysis were fit into the multivariable analysis. In the final model, statistical significance was set at  $p < 0.05$ .

**Results:** Of 844 study participants, more than half ( $n=499$ ; 58.8%) were female. Participants' mean weight increased from 54.2kg ( $SD \pm 9.6$ kg) at baseline to 59.5kg ( $SD \pm 10.7$ kg) at the end of follow-up. Duration of time on ART, sex, World Health Organization (WHO) clinical disease staging, functional status, nutritional status, and presence of opportunistic infections (OIs) were significant predictors of weight change at ART initiation. Significant interaction effects were observed between time and sex, WHO clinical disease staging, functional status, isoniazid preventive therapy (IPT), and nutritional status.

**Conclusion:** We found a linear increment of weight over 24 months of follow-up. Rate of weight gain over time was lower in patients with advanced disease stage and working functional status, whereas weight gain rate was higher in male and underweight patients.

**Keywords:** Adults living with HIV, ART, Ethiopia, weight change

**Time to Detection of Anemia and Its Predictors among Women of Reproductive Age Living With HIV/AIDS Initiating Art at Public Hospitals, Southwest Ethiopia: A Multicenter Retrospective Follow-Up Study.** *Alemayehu Sayih Belay*

**Background:** Anemia is the most common hematological problem and the poor prognostic marker of HIV disease in the world. It has been associated with different causes such as adverse reactions of medications, opportunistic infections, neoplastic diseases, infections, and micronutrient deficiencies. It has enormous fetomaternal outcomes such as premature birth, spontaneous abortion, stillbirth, low birth weight, postpartum depression, childhood cognitive developmental delays, and in general, it may end up with infant/child mortality. Hence, this study aims to assess the time to development of anemia and its predictors among women of reproductive age on ART in public hospitals, Southwest Ethiopia.

**Method:** A retrospective follow-up study was conducted among 389 HIV-positive women of reproductive age at public hospitals. The data was collected using a pretested and properly designed data extraction tool and a systematic sampling method. The data was entered using Epi-Data Manager 4.2 and exported to STATA version 14 for data analysis. Cox-regression model was used and variables with a  $p$ -value of  $<0.05$  at 95% confidence level in multivariable analysis were declared as statistically significant predictors for anemia.

**Results:** Out of 370 records of women of reproductive age, 203[54.86, 95% CI: (49.77%, 59.96%)] were anemic with an incidence rate of 12.07 per 100 PMO (95% CI: 10.51, 13.85), and the overall median survival time of 60 months. Moreover, non-employed women [AHR: 1.465 (95% CI: 1.054, 2.037)], women with advanced WHO stage [AHR: 2.493 (95% CI: 1.403, 4.428)], women with baseline opportunistic infections [AHR: 2.995 (95% CI: 2.122, 4.227)], and women who were on ART for long-duration [AHR: 1.627 (95% CI: 1.039, 2.547)] were significantly associated with anemia among women of reproductive age with HIV.

**Conclusion:** In this study, the incidence rate of anemia was significantly high. The risk of anemia is increased in women of reproductive age with HIV due to; advanced baseline WHO staging, presence of OIs at baseline, an increased duration on ART, and low occupational status. Therefore, early identification and treatment of opportunistic infections and other co-infections are required to decrease the incidence of anemia among women with HIV.

**Keywords:** Detection, Anemia, Predictors, Women of Reproductive Age, ART, Hospital, Ethiopia

**Increasing burden of Acute Hepatitis A among Ethiopian Children, Adolescents and Young adults: A change in Epidemiological pattern and need for hepatitis A vaccine.** *Abate Bane, Amir Sultan, Rabia Ahmed*

**Background:** Hepatitis A is a vaccine-preventable, feco-oral infection due to poor sanitary conditions. It is predominantly acquired during early childhood and results in lasting acquired protective immunity. However, it results in severe disease which can end up in acute fulminant hepatitis and hepatic failure when acquired during adolescence and adulthood. Several studies previously conducted in Brazil and India, have shown that the prevalence of symptomatic acute hepatitis A infection increases among children, adolescents, and young adults when the socioeconomic status of a society improves. Individuals acquire Hepatitis A infection at a later age when they are exposed for the first time to contaminated food and drinks after being brought up in a relatively clean environment. WHO doesn't recommend routine vaccination against hepatitis A in high endemic settings, like Africa and Asia, associated with poor sanitary conditions? However, studies from multiple countries shown the increase in sanitation has led to the increase in symptomatic hepatitis A infection.

**Methods:** This is a cross- sectional study conducted in a Medical Center in Addis Ababa to determine the current trend of acute hepatitis A infections and its association with socioeconomic status. Socio-demographic and clinical data were collected from patients who were diagnosed with acute viral hepatitis infection at Adera Medical Center in 2020. Consent was obtained from the institute to collect data. Data was entered and analyzed using SPSS24.

**Results:** This study showed that clinical acute hepatitis A is more prevalent as compared to acute hepatitis B and C. Among patients diagnosed with acute viral hepatitis, 93.5% of the patients were found to have hepatitis A while only 6.5% of the patients had hepatitis B and non were diagnosed with acute hepatitis C infection during the study period. Hepatitis A is becoming common among children, adolescents, and young adults from relatively high-income families. Among patients with acute hepatitis A, 88.89% were from middle and high-income families.

**Conclusions:** As the socioeconomic status of Ethiopia is improving, the prevalence of acute hepatitis A infection appears to be increasing and shifting towards adolescents and young adults. This is partly due to reaching adolescence and adulthood without acquiring immunity from early childhood infection. Thus, there is a rationale to make hepatitis A vaccine available for vulnerable groups immediately and to incorporate hepatitis A vaccine in the Expanded Program on Immunization (EPI) in the future to combat the spread of HAV as well as the complications associated with acute hepatitis A infection.

**Keywords:** Hepatitis A, Hepatitis B, Hepatitis C, acute viral hepatitis, Expanded Program on Immunization

**Community-Based Sero-Prevalence of Chikungunya and Yellow Fever in the South Omo Valley of Southern Ethiopia.** *Adugna Endale Wodegiorgis*

**Background:** Chikungunya (CHIK) and yellow fever (YF) are becoming major public health threats in East African countries including Ethiopia. In Ethiopia, there is no reliable information about the epidemiology of CHIK. This study aimed to assess a community-based sero-prevalence of CHIK and YF in the South Omo Valley, an endemic area for YF.

**Methods:** Between February and June 2018, blood samples were collected from study participants and screened for IgG antibody against CHIK virus (CHIKV) and YF virus (YFV) infections using ELISA. Data were computerized using Epi Data Software v.3.1 and analyzed using SPSS.

**Results:** A total of 360 participants (51.7% males, age range from 6 to 80, mean age  $\pm$  SD = 31.95  $\pm$  14.05 years) participated in this study. The overall sero-prevalence of IgG antibody was 43.6% (157/360) against CHIKV, while it was 49.5% (155/313) against YFV. Out of 155 samples which were positive for IgG antibody to YFV, 93 (60.0%) were positive for IgG antibody to CHIKV. Out of 158 samples which were negative for IgG antibody to YFV, 64 (40.5%) were positive for IgG antibody to CHIKV. There was a significant positive correlation between IgG antibodies to CHIKV and YFV ( $sr = 0.82$ ;  $P < 0.01$ ). Residency in the Debub Ari district (AOR = 8.47; 95% CI: 1.50, 47.74) and travel history to sylvatic areas (AOR = 2.21; 95% CI: 1.02, 4.81) were significantly and positively associated with high sero-prevalence of IgG antibody to CHIKV and YFV, respectively.

**Conclusion:** High sero-prevalence of IgG antibody to CHIKV shows the circulation of the virus in the present study area. A low sero-prevalence of IgG antibody to YFV in YF vaccine received individuals is highly concerning from a public health point of view as waning of immune response to YFV infection could result in a periodic outbreaks of YF in endemic areas. Nevertheless, the present study has not investigated for possible cross-reactivity of antibody to CHIKV with other alphaviruses like O'nyong-nyong virus and antibody to YFV with other flaviviruses like Dengue fever virus and this warrants further studies in the present study area.

**Prevalence and Associated Factors of Pulmonary Tuberculosis among Prison Inmates in Sub-Saharan Africa: a Systematic Review and Meta-Analysis.** Tesfa Birlew, Habtamu Belew

**Background:** Prisoners are at a high risk of tuberculosis transmission due to overcrowding and poor ventilation in Sub-Saharan Africa (SSA). However, tuberculosis is a leading cause of morbidity and mortality; many inmates face several obstacles that impede TB control. Thus, this systematic review and meta-analysis was aimed to estimate the overall pooled prevalence of pulmonary tuberculosis and associated factors among prisoners in SSA.

**Methods:** A systematic review and meta-analysis were undertaken using various databases: Pubmed, EMBASE, Web of Science and Scopus from 2006-2019. Data were extracted using a standardized data extraction format in Microsoft Excel, and the analysis was performed using STATA version-14. The  $I^2$  test and the Cochrane Q test statistics were computed to detect heterogeneity across the studies. The random effect meta-analysis model was applied to determine the overall prevalence of tuberculosis and associated factors among prison populations.

**Results:** Of 3,479 retrieved articles, 37 studies comprising 72,844 inmates met the inclusion criteria. The pooled prevalence of pulmonary tuberculosis among prison inmates in SSA was 7.74% (95 % CI: 6.46-8.47). The highest prevalence of pulmonary tuberculosis among prisoners were found in the Democratic Republic of Congo (19.72 %, 95 %CI: 15.86-23.59), Zambia (11.68%, 95 %CI: 5.61-17.75) and Ethiopia (9.22 %, 95 % CI: 6.59-11.85). TB/HIV coinfection: OR 4.99 (95 % CI: 2.60-9.58), BMI<18.5: OR 3.62 (95 % CI: 2.65-6.49), incarceration: OR 4.52 (95 % CI: 2.31-5.68), and previous TB exposure: OR 2.43 (95 % CI: 1.61-3.56) had higher odds of pulmonary tuberculosis among inmates.

**Conclusion:** The burdens of pulmonary TB among prison inmates in SSA were found to be high. TB/HIV coinfection, BMI, duration of incarcerations, and TB exposure were associated factors of pulmonary tuberculosis among prison inmates. Therefore, emphasizing early screening for those prisoners at the risk of pulmonary tuberculosis is essential.

**Keywords:** Tuberculosis, Associated factors, Prisoners, SSA



## Reproductive Health and Gender

Abs 11

### **Menstrual Hygiene Practice among Adolescent Girls in Ethiopia: a Systematic Review and Meta-Analysis.** Biniyam Sahiledengle

**Background:** Adolescent girls face several challenges relating to menstruation and its proper management. Lack of adequate sanitary products, inadequate water supply, and privacy for changing sanitary pads continue to leave adolescent girls with limited options for safe and proper menstrual hygiene in many low-income settings, including Ethiopia. These situations are also compounded by societal myths, stigmas surrounding menstruation, and discriminatory social norms. This systematic review and meta-analysis aimed to estimate the pooled proportion of safe menstrual hygiene management among adolescent girls in Ethiopia using the available studies.

**Methods:** We searched PubMed, Google Scholar, African Journal Online (AJOL), Hinari, Science Direct, ProQuest, Direct of Open Access Journals, POPLINE, and Cochrane Library database inception to May 31, 2021. Studies reporting the proportion of menstrual hygiene management among adolescent girls in Ethiopia were considered. The Cochrane Q test statistics and  $I^2$  tests were used to assess the heterogeneity of the included studies. Since the included studies revealed considerable heterogeneity, a random effect meta-analysis model was used to estimate the pooled proportion of safe MHM.

**Results:** Of 1,045 identified articles, 22 studies were eligible for analysis (n=12,330 participants). The overall pooled proportion (PP) of safe MHM in Ethiopia was 52.69% (95%CI: 44.16, 61.22). The use of commercial menstrual absorbents was common 64.63% (95%CI: 55.32, 73.93,  $I^2$  99.2%) followed by homemade cloth 53.03% (95%CI: 22.29, 83.77,  $I^2$  99.2%). Disposal of absorbent material into the latrine was the most common practice in Ethiopia 62.18% (95%CI: 52.87, 71.49,  $I^2$  98.7%). One in four girls reported missing one or more school days during menstruation (PP: 32.03%, 95%CI: 22.65%, 41.40%,  $I^2$  98.2%).

**Conclusion:** This study revealed that only half of the adolescent girls in Ethiopia had safe MHM practices. To ensure that girls in Ethiopia can manage menstruation hygienically and with dignity, strong gender-specific water, sanitation, and hygiene (WASH) facilities along with strong awareness creation activities at every level are needed.

**Keywords:** Menstrual hygiene management; adolescent girls; Ethiopia

**Burden and Causes of Maternal Disorders in Sub-Saharan Africa from 1990 to 2019.**

*Alemnesh Hailemariam Mirkuzie, Alemnesh H. Mirkuzie, Latera Tesfaye Olana, Delayehu Bekele, Getachew Mullu Kassa, Gizachew Tessema, Awoke M Temesgen*

**Background:** Maternal Disorders (MDs) remain a daunting global challenge. The Sub-Saharan African (SSA) region has 66 % of the global burden of Maternal Mortality and Ethiopia alone contributes 4.7% of the global burden. Most of the causes of MD are preventable and treatable with available interventions and technologies. This study addresses evidence gaps on the disease burden and causes of MDs in Sub-Saharan Africa (SSA) using 30 years data from the Global Burden of Disease (GBD) 2019 study.

**Findings:** In SSA, the rate of DALYs attributed to MDs has shown a 52% significant reduction from 4,170 per 100,000 reproductive age women (95%UI: 4,793, 2,653) in 1990 to 2,187 (95%UI: 2,653, 1,795) in 2019. The Eastern SSA region having the highest rate of DALYs in 1990 recorded the highest reduction from 4,938 (95%UI: 5,923, 4,163) to 2,007 (95%UI: 2,389, 1,667) in 2019. The Southern SSA region having the lowest rate of DALYs in 1990 showed inconsistent trend over the years. In SSA five direct maternal causes accounted for 65% of the total rate of DALYs in 2019 and 79% in 1990. Of these, Abortion and miscarriage was the leading contributor in 1990 accounting for 27% of the rate of DALYs attributable to MDs, which had shown a 48% reduction by 2019. Haemorrhage accounted for the 20% of the rate of DALYS in 1990 remained the same in 2019. Hypertensive disorders accounted for 10.5% of the rate of DALYs in 1990 has increased to 12.2% in 2019.

**Conclusion:** The burden of MDs in SSA has shown significant improvement over the years with wide variation across the regions driven mainly by the improvement in reducing the burden of Abortion and miscarriage in Eastern SSA region. The inconsistent and poor progress recorded in the Southern SSA region was attributed to the burden of HIV/AIDS and the increase in the burden of indirect causes of MDs. The regions in the SSA need to have tailored interventions to reduce the burden of MDs.

**Prevalence of Perinatal Asphyxia and Its Associated Factors in Ethiopia: A Systematic Review and Meta-Analysis.** *Moges Agazhe Assemie*

**Background:** Perinatal asphyxia (PNA) is a lack of blood flow or gas exchange to or from the infant in the period immediately during or after the birth process. Perinatal asphyxia is a severe health problem and a major cause of neonatal morbidity and mortality worldwide. In Ethiopia, despite many studies conducted, the reported findings are inconsistent. The aim of this study is to ascertain pooled estimates of key reports to enhance the quality and consistency of the evidence.

**Method:** Systematic review and meta-analysis using computer databases searches were performed to locate all articles on the prevalence of PNA. Databases included were PubMed/MEDLINE, Cochrane Library, Scopus, and Science Direct. Two authors screened and extracted the data independently. A random-effects model was used to calculate pooled estimates. The I<sup>2</sup> tests were used to assess the heterogeneity of the studies. Result: The prevalence of PNA ranges 3.1% to 32.9%. The pooled estimate of 16 articles with a sample size of 9,816 was 20.02% (95% CI: 14.93, 23.90). The highest prevalence (24%) was observed in Southern Nations, Nationalities, and People's Region and the lowest (8%) in Dire Dawa City Administration. Pooled odds ratio estimates from included studies revealed prolonged labor (OR=1.38, 95% CI: 1.01, 1.75), low birth weight (OR=1.73, 95% CI: 1.31, 2.15), meconium-stained liquor (OR=1.76, 95% CI: 1.46, 2.06), pre-term (OR=1.71, 95% CI: 1.19, 2.23), and caesarian delivery (OR=1.9, 95% CI: 1.54, 2.26) as significant risk factors of PNA.

**Conclusion:** In this review, the pooled prevalence of PNA in Ethiopia was found high at 20.02%. Maternal antepartum related, maternal and fetal intrapartum related factors were risk factors for PNA. This information may be useful in guiding the improvement of facility-based maternal intrapartum care, fetal intrapartum factor and inform programs on the enhancement of the nutritional status of pregnant mothers to manage the low weight of neonates. Keywords: Birth asphyxia; perinatal asphyxia; neonatal mortality and morbidity; Ethiopia

**Effects of Continuum of Care in Maternal Health Services on Perinatal Mortality in Benishangul Gumuz Region, Northwest Ethiopia: Propensity Score Matching (PSM) Modeling.** Muluwas Amentie Zelka

**Background:** Globally, around 4 million of babies were died within the first month and more than 3 million were stillbirth. Among them, 99% of newborn deaths and 98% of stillbirth occur in developing countries. Despite give a priority for maternal health services, perinatal mortality are still major public health problems and big challenge in Ethiopia particularly in study area. Despite that study conduct on effectiveness of continuum of care in maternal health services was scare in Ethiopia but not done in study area. Thus, this study aimed to fills this gap.

**Methods:** A prospective follow-up study design was employed from March 2020 to January 2021 in Benishangul Gumuz Region, Northwest Ethiopia. A multistage sampling technique was used to recruit 2,198 pregnant women. Data were collected by using semi-structured and pretested interviewer questionnaire. Collected data were coded, entered, cleaned and analyzed by using STATA 14. Finally, Propensity Score Matching (PSM) modeling was applied to determine effectiveness of continuum of care in maternal health services.

**Results:** Prevalence of perinatal mortality rate was 4.8% (95%CI: 4.6 – 4.9): stillbirth 2.7% (95%CI: 2.6 – 2.8) and early neonatal mortality 2.3% (95%CI: 2.1 – 2.4). The main causes of neonatal death were asphyxia (66%), sepsis (50.5%) and pneumonia (42%) whereas possible causes of stillbirth were sepsis (80.7%) and maternal malnutrition 41.0%). As treatment effect, completion of continuum of care in maternal health services via time dimension ( $\beta = -0.03$ ), space dimension ( $\beta = -0.02$ ) and completion of key services of MHS ( $\beta = -0.04$ ) were associated with a significant reduction in the likelihood of perinatal death

**Conclusions:** The results suggested that perinatal mortality rate were high as compared with national and international target. Completion of COC in MHS is an effective strategy in reduction perinatal death. Efforts should be made to strengthening completion of maternal health services.

**Effect of Maternity Waiting Homes on Maternal and Perinatal Birth Outcome and Its Challenge in Amhara Region, Northwest Ethiopia.** *Muluje Molla Simieneh*

**Background:** Women dying due to complications of pregnancy and childbirth is still high. Maternity waiting home is one of the strategies to reduce maternal and newborn deaths. neonatal morbidity. However, there is limited evidence on the effect of using maternity waiting homes on birth outcomes particularly in this study area. In addition, in the past studies, propensity score matching method was not used to evaluate the effect of maternity homes. Therefore, this study was aimed to estimate the effect of staying in maternity waiting homes on maternal and perinatal birth outcomes and its challenges in, Amhara region, Northwest Ethiopia 2018.

**Methods:** - Institutional based comparative cross-sectional study using both quantitative and qualitative approach was conducted. Data was collected using structured questionnaire interview and chart review and entered with Epi-Data 3.1 and exported to STATA version 14.0 for analysis. Propensity score matching analysis was used to estimate the effect of maternity waiting home on birth outcome. Propensity score matching analysis was used to match potential differences in background characteristics that affect pregnancy outcomes between comparison groups. Thematic analysis was used for qualitative data.

**Result:** - Total of 548 pregnant mothers (274 stayed in maternity waiting homes and 274 did not stay) were participated in this study. The proportion of adverse birth outcome of mothers who stayed maternity waiting homes was 15(5.5%) which is lower than those who didn't stay 35 (12.8 %). After matching by propensity score, mean adverse maternal birth outcome, difference between didn't used maternity waiting home and used was 10.4 %, at ( $t=3.78$ ) at 5% level of significant. Similarly mean adverse perinatal birth outcome difference between mothers who didn't used MWH and used was 11% ( $t=4.33$ ). The qualitative study findings also showed that; absence of enough rooms, shortage of water, lack of variety of food, lack of regular health care, recreational devices and lack of family care providers were the identified challenges for pregnant mother's while they were staying at maternity homes.

**Conclusions and Recommendations:** maternity waiting home showed significant positive effect on birth outcome. Mothers stayed in maternity waiting home had low adverse maternal and perinatal birth outcome compered to none users. Accommodations and quality health care services were the challenge of mothers faced during their staying in the maternity waiting homes. Therefore, all concerned bodies should give attention accordingly for maternity waiting home service in order to reduce adverse birth outcomes through strengthening of quality health care provided.

**Key word:** Effect, maternity waiting home, birth outcome, challenge, Northwest Ethiopia

## **Sexual Violence and Associated Factors among Housemaids in Ethiopia: A Systematic Review and Meta-Analysis** *Birye Dessalegn Mekonnen*

**Background:** Housemaids often experience different types of sexual violence by different perpetrators. Sexual violence against housemaids remains usually concealed as victims cannot report such offences. Except for fragmented studies with varying reports, there are no national prevalence studies conducted on sexual violence among housemaids in Ethiopia. Thus, this systematic review and meta-analysis aimed to determine the pooled prevalence and associated factors of sexual violence amongst housemaids in Ethiopia.

**Methods:** A systematic search of PubMed, Embase, Science Direct, HINARI, Scopus, Cochrane Library, and Google Scholar was conducted from October 10, 2021 to November 20, 2021. Data were extracted using the Joanna Briggs Institute (JBI) tool. The quality of all selected articles was evaluated using JBI critical appraisal checklist. Data analysis was performed using STATA Version 14 statistical software. Egger's test and funnel plot used to evaluate publication bias. Heterogeneity was assessed using Cochran's chi-squared test, and quantified by  $I^2$  values. A random effects model was applied during meta-analysis if heterogeneity was exhibited; otherwise, a fixed-effects model was used.

**Results:** After reviewing 37,849 articles, 8 studies involving 3,324 housemaids were included for this systematic review and meta-analysis. The pooled prevalence of life time sexual violence among housemaids in Ethiopia was 46.26% (95% CI: 24.69, 67.84). The pooled prevalence was 55.43% (95% CI: 26.38, 84.47) for sexual harassment, 39.03% (95% CI: 14.55, 63.52) for attempted rape, and 18.85% (95% CI: 7.51, 30.19) for rape. Sexual violence is more likely among housemaid who previously lived rural residence (AOR = 2.25; 95% CI: 1.41, 3.60), drinks alcohol (AOR = 2.79 95% CI: 1.02, 4.56), and employer alcohol consumption (AOR = 6.01; 95% CI: 1.10, 32.96).

**Conclusion:** This study revealed that the prevalence of sexual violence against housemaids in Ethiopia is high. Of the forms of sexual violence against housemaids, sexual harassment is high. Male employers are the vast majority of perpetrators of their housemaids. Thus, concerned stakeholders should develop and implement interventions that could empower housemaids in their struggle towards elimination of sexual violence, create awareness for men, control and monitor implementation of legislation and policies, and prompt punishment of the perpetrators.

**Keywords:** Prevalence, Housemaid, Sexual violence, Systematic review, Ethiopia

**Birth Asphyxia Mortality in Northwest Ethiopia: a Multi-Centre Cohort Study.** *Daniel Bekele Ketema, Yihalem Abebe Ketema, Abeba Mengist, Animut Alebel*

**Background:** Birth asphyxia is a leading cause of neonatal mortality. Understanding the causes of death in asphyxiated newborns will help to design appropriate care. Thus, the goal of this study was to identify predictors of neonatal mortality in asphyxiated newborns in northwest Ethiopia selected hospitals.

**Methods:** An institution based prospective cohort study was conducted among 480 newborns with the diagnosis of birth asphyxia in Northwest Ethiopia selected Hospitals. All infants with asphyxia from November 1, 2018 to November 1, 2019, who were sequentially admitted to the neonatal critical care unit, were considered. Data were obtained prospectively from mothers using an interviewer's administered questionnaire. Data was entered using Epi-data version 4.2 and analyzed using Stata software version 16. The Kaplan-Meier survival curve was used to estimate the time to mortality, and Log rank test was used to compare the survival curves between different predictor variables. Bivariable and multivariable Cox proportional hazard regression model was fitted to identify independent predictors' neonatal mortality for asphyxiated newborns. Adjusted hazard Ratio (AHR) with 95% CIs were used to measure the strength of association and test statistical significance

**Results:** The overall cumulative incidence of mortality among asphyxiated newborns was 42.29% (95%CI: 38%, 46). Comorbidity other than asphyxia (AHR=2.63, 95%CI:1.69, 4.10), oxygen saturation of 50-69 (AHR=4.62, 95%CI:2.55, 8.37), oxygen saturation of 70-89 (AHR=2.82, 95%CI: 1.80, 4.42), severe Apgar score at one minute (AHR=1.59, 95%CI:1.12, 2.25), neonates with Hypoxic Ischemic Encephalopathy (HIE) (AHR=6.12, 95% CI:2.23, 16.75) had a significant association with increased risk of neonatal mortality among asphyxiated neonates.

**Conclusions:** According to this study, the overall incidence rate of mortality among asphyxiated infants remained high, with nearly half of the neonates were died. Newborns with comorbidities other than asphyxia, a severe Apgar score at one minute, neonates who develop HIE, and neonates with low oxygen saturation have been identified as having the highest risk of neonatal death. Therefore, designing appropriate care and prevention methods should be considered for these identified variables.

**Keywords:** Asphyxia, neonatal mortality. Birth asphyxia, Northwest Ethiopia

**Individual and Community-Level Determinates of Risky Sexual Behaviors among Unmarried Sexually Active Men: A Multilevel Analysis of 2016 Ethiopian Demographic and Health Survey.** *Gedefaw Diress*

**Background:** Men's risky sexual behaviors contribute to the spread of HIV in sub-Saharan Africa. But, to date, there is limited evidence on community-level determinants of risky sexual behavior among non-married sexually active men. Therefore, this study aimed to identify factors associated with risky sexual behavior among non-married sexually active men in Ethiopia.

**Methods:** Secondary data analysis was employed using the 2016 Ethiopian Demographic and Health Survey. A total weighted sample of 5680 unmarried sexually active men was included. The main outcome variable was risky sexual behavior defined as having at least one of the following: multiple sexual partners; initiation of sex before the age of 18 years and inconsistent condom use in the last 12 months. A multilevel logistic regression model was used to identify individual and community level determinants of risky sexual behavior. Four models containing variables of interest were fitted. Finally, the adjusted odds ratio with a 95% confidence interval was reported.

**Results:** The overall magnitude of risky sexual behavior was 26.9% with the highest prevalence was observed in Addis Ababa (47.5%). Primary education (AOR = 0.44, 95% CI =0.32-0.61), middle wealth index quantile (AOR=0.63, 95% CI=0.41-0.96), living in communities with a high proportion of poverty (AOR= 0.62, 95% CI=0.40-0.98) and living in communities with a high proportion of media exposure (AOR= 0.42, 95% CI=0.12-0.75) were associated with lower odds of risky sexual behavior. Whereas, currently working (AOR=2.49, 95% CI =1.64-3.77), tested for HIV (AOR=2.51, 95% C=1.95-3.23), alcohol drinking almost every day (AOR=5.49, 95 CI=2.73-11.02), and using the Internet almost every day in the last month (AOR=1.99, 95% CI= 1.06-3.74) increase the odds of risky sexual behavior.

**Conclusion and implication:** A significant number of unmarried men are involved in risky sexual behaviors. Alcohol drinking, currently working, and using the Internet every day, are factors that increase the odds of risky sexual behavior. To reduce risky sexual behaviors, intervention should be targeted on drinking behavior and working status of sexually active men.

**Keywords:** Sexual behaviors; unprotected sex; multiple sexual partners; sexually active men; Ethiopia



**Determinants of Adverse Perinatal Outcomes among Mothers Who Gave Birth at Selected Governmental Hospitals in Southwest Ethiopia.** *Terefe Keto Malo*

**Background:** Adverse perinatal outcome is the major challenge both in low and middle-income countries. Globally, adverse birth outcomes such as preterm birth, low birth weight, stillbirth, and neonatal death are significant. Neonatal morbidities and mortalities are one of the most common contributing factors for 11.8 million deaths. Despite comprehensive strategies, interventions prevention of adverse birth outcomes has remained largely unaddressed.

**Objectives:** To assess the determinants of adverse perinatal outcomes among mothers who gave birth at selected governmental hospitals in southwest Ethiopia.

**Methods:** Facility-based unmatched case-control study designs were used to examine determinants of adverse perinatal outcomes from April to June 2021 among mothers who gave birth at Mizan Tepi-University Teaching Hospital, Tepi General Hospital, and Bonga Gebre-Tsadik Shawo General Hospital. The data was collected through an interview by considering the COVID-19 prevention protocol. A total of 312 study subject was included in the study. The study subjects were selected through consecutive sampling techniques. Data was entered using EpiData and analyzed by using SPSS version 23. A threshold p-value of less or equal to 0.05 was used to declare a significant association between perinatal outcomes and its predictors in the chi-square test. Bivariate logistic regressions were done. Variables significantly associated with perinatal outcomes in bivariate logistic regressions were included in the multiple logistic regressions. Crude and adjusted odds ratios were used to measure the strength association.

**Result:** Adverse perinatal outcome was 5.9 times higher in mothers who had unplanned pregnancy (AOR: 5.9(2.16, 16.16), 3.48 times higher among mothers who did not receive iron during pregnancy (AOR: 3.48( 1.24, 9.73) and, five times higher risk in mother with a history of chronic hypertension (AOR: 5.11(1.98, 13.17). In contrast, the risk was (AOR: 0.33(.17, .62) and (AOR: 0.43(.22, .87) lower among mothers who were urban Residence and who had term birth.

**Conclusion:** Special emphasis should be given to women whose Residence is rural, unplanned pregnancy, preterm birth, and women with a history of chronic hypertension and iron supplement were identified as a protective factor to adverse pregnancy outcomes.

**Keywords:** Adverse perinatal outcome, Low birth weight, Prematurity, Stillbirth

**Impact of COVID-19 Pandemic on Utilization of Essential Maternal Healthcare Services in Ethiopia: A Systematic Review and Meta-Analysis.** *Birye Dessalegn Mekonnen*

**Background:** The COVID-19 pandemic has a significant challenge for countries to maintain the provision of essential maternity services. Many women could experience difficulties in accessing maternal healthcare due to transport problems, anxiety, and fear of infection. A reduction in utilization of maternity services has been suggested as a possible cause of worsened maternal health outcomes. Thus, this study was aimed to determine the impact of the COVID-19 pandemic on the utilization of maternal healthcare services in Ethiopia.

**Methods:** Search of articles was conducted from PubMed, Science Direct, Cochrane Library, Web of Science, Scopus, and Google scholar. The quality of studies was evaluated using the Newcastle-Ottawa scale. Funnel plots asymmetry and Egger's test were used to evaluate the evidence of publication bias. Heterogeneity was evaluated using Cochran's Q statistic and quantified by  $I^2$ . A random-effects model was used to determine pooled estimates using STATA 14.

**Results:** After reviewing 41,188 articles, 21 studies were included in the qualitative review and 15 in the meta-analysis. The pooled reduction was 26.62% (95% CI: 13.86, 39.37) for family planning, 19.30% (95% CI: 15.85, 22.76) for antenatal care, 12.82% (95% CI: 7.29, 18.34) for institutional delivery, 17.82% (95% CI: 8.32, 27.32) for postnatal care, and 19.39% (95% CI: 11.29, 27.49) for abortion care. This study also demonstrated that maternal perception of poor quality of care and fear of infection, lack of transport, cultural events, diversion of resources, lack of essential drugs, and lack of personal protective equipment and sanitizer were identified as main challenges faced during the pandemic.

**Conclusion:** This study revealed that utilization of maternal healthcare services in Ethiopia was significantly decreased during the COVID-19 pandemic. Government measures, health facility-related barriers, and maternal-related factors were identified challenges faced during the pandemic. Thus, maternity care should be prioritized as an essential core healthcare service by service providers, policy-makers, and other relevant stakeholders. Besides, increasing awareness of women through mass media, and making maternity services more accessible and equitable would likely increase the utilization of maternal healthcare services.

**Systematic review registration:** PROSPERO CRD42021293681.

**Keywords:** COVID-19, Impact, Maternal healthcare, Systematic review, Ethiopia

## Mental Health and NCDs

Abs 21

### **High Burden of Diabetes and Pre-Diabetes among Cancer Patients at University Of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia.** *Haileab Fekadu Wolde*

**Introduction:** Cancer and diabetes mellitus (DM) are diagnosed within the same individual more frequently and they share common risk factors. Although, diabetes among cancer patients may result in more aggressive clinical course of cancer, strengthening its metastatic potential and increased mortality, there is limited evidence about its burden and associated factors. Hence, this study aimed to assess the burden of diabetes and pre-diabetes among cancer patients and its associated factors.

**Methods:** Institution based cross-sectional study was conducted at university of Gondar comprehensive specialized hospital from January 10 and March 10, 2021. Systematic random sampling technique was used to select a total of 423 cancer patients. Structured interviewer administered questioner was used to collect the data. Pre-diabetes and diabetes diagnosis was made based on World Health Organization (WHO) criteria. Both bi-variable and multivariable binary logistic regression models were fitted to identify factors associated with the outcome. Adjusted Odds Ratio (AOR) with 95% confidence interval was estimated to show the direction and strength of associations. P-value of less than 0.05 in the multivariable logistic regression analysis was used to declare statistically significant association.

**Results:** The final analysis was based on 384 patients with cancer. The proportion of pre-diabetes and diabetes was found to be 56.8% (95% CI: 51.7, 61.7) and 16.7% (95% CI: 13.3, 20.8), respectively. Alcohol consumption was found to increase the odds of elevated blood sugar among cancer patients (AOR: 1.96; 95%CI: 1.11, 3.46).

**Conclusion:** The burden of pre-diabetes and diabetes is alarmingly high among cancer patients. Besides, alcohol consumption was found to increase the odds of having elevated blood sugar among cancer patients. Hence, it is essential to recognize cancer patients are at high risk of having elevated blood sugar and design strategies to prevent this disease.

**Key words:** Cancer, Diabetes, Pre-diabetes

## **Hypothalamic-Pituitary Thyroid Axis Functional Status and Its Correlation with Psychotic Symptoms Severity and Improvement in Schizophrenia Patients.** *Yohannes Woldesenbet*

**Background:** Hypothalamic-pituitary-thyroid (HPT) axis function in schizophrenia patients is affected by the disease itself and antipsychotic drugs used by the patients too. But, there are controversial reports in the literature.

**Objective:** To assess the HPT axis hormones and their correlation with psychotic symptoms severity and improvement in newly diagnosed schizophrenia patients in Jimma University Medical Centre, Jimma, Ethiopia.

**Method:** A longitudinal study was carried out at Jimma University Medical Centre Psychiatry Clinic. Participants in the study were newly diagnosed schizophrenia patients in the outpatient and inpatient departments. Data were collected from March 1 to August 31, 2019. Baseline data were collected during the patients' enrollment in the outpatient department of the Psychiatric clinic, and end-of-treatment data were collected after eight weeks of treatment. The severity and improvement of psychotic symptoms were evaluated using the Positivity and Negativity Syndrome Scale (PANSS) rating manual. The chemiluminescent microparticle immunoassay technique was used to analyze serum levels of triiodothyronine (T3), thyroxine (T4), and thyroid-stimulating hormone (TSH).

**Result:** We included 34 newly diagnosed schizophrenia patients in the study. Twenty-five (73.5%) of them were males and 9(26.5%) were females. The mean age of the patients was  $32.68 \pm 11.84$ . The majority of the patients were urban residents.

Psychotic symptoms showed significant decline after eight weeks of treatment (baseline Vs post treatment PANSS positive sub score: ( $t = 6.24$ ,  $p=0.000$ ); baseline Vs post treatment PANSS negative sub score: ( $t = 4.2$ ,  $p=0.000$ )); baseline Vs post treatment PANSS general score ( $t = 2.05$ ,  $p=0.048$ ).

There was no significant decrease in serum concentrations of T3 and T4 after eight weeks of treatment; T3:  $t=1.12$ ,  $p=0.272$  and T4:  $t=0.58$ ,  $p=0.561$ . But, a significant decrease in serum concentration of TSH ( $t=-2.47$ ,  $p=0.019$ ) was observed after treatment.

We found no correlation between thyroid hormones and psychotic symptoms at baseline and end-line ( $P>0.05$ ).

**Conclusion:** Although there was an improvement in psychotic symptoms in patients with schizophrenia, the improvement was not significantly correlated with serum concentrations of T3, T4, and TSH. We recommend further research in a large sample.

**Key words:** Hypothalamic-pituitary-thyroid axis function, schizophrenia, psychotic symptoms, Ethiopia.

**Review on the Effect of Political Violence on Community Mental Health and the Way Forward** *Geta Walelign Debebe*

When the war is over, I will dream all those dreams I cannot afford to now. . . If I were to sit down and think of my emotional state, I would break down. You Europeans, you can have the luxury of analyzing your feelings; we plainly have to endure." -**A mother of five children in Beirut in 1983**

**Objectives:** Ethnic conflict, political violence and wars that presently shape many parts of world are rising from day to day. Though political violence is increasingly played out within everyday civilian environments, its impact on mental health remains largely unknown.

**Method:** A systematic search of six databases resulted in the identification of 568 studies, of which 32 were included in the review. These studies investigated the influence of political violence on contextual variables that shape mental health and psychosocial wellbeing, and examined psychological distress and mental disorders in the context of political violence.

**Results:** Symptomatic individuals in war settings may experience new-onset disaster-related psychiatric disorders, exacerbations of preexisting psychopathology, and/or psychological distress. The prevalence of post-traumatic stress disorder and major depression are the most common ones. Risk factors for poorer mental health included female sex, lower socioeconomic status, and exposure to violence, frequent social media use and lower resilience. Reliance on religious support, and, in particular, support from and participation in activities of religious institutions, emerged as a significant protective factor.

**Conclusion:** The review shows compelling evidence that political violence is associated with adverse mental health outcomes. Some implications for health care professionals, policy makers, community leaders, state government officials and volunteers are discussed to be vigilant for the mental and psychological needs of civilian during the political violence.

**Keywords:** Mental health, Mental disorders, Political Violence

## Nutrition and Food Science

Abs 24

### **Prevalence of Anemia and Associated Factors among Adolescent Girls in Ethiopia: A Systematic Review and Meta-Analysis.** *Samuel Derbie Habtegiorgis*

**Background:** Anemia is the reduction of red blood cells in size and numbers and an indicator of both poor nutrition and poor health. It is a major global public health problem. Anemia in adolescents and young adults can have negative effects on their cognitive performance and growth. In Ethiopia, previous studies yielded variable prevalence. This review aimed to determine the pooled prevalence of adolescent girls' anemia and associated factors in Ethiopia.

**Methods:** We searched for studies reporting anemia and associated factors among adolescent girls as reported in peer reviews publications in Ethiopia from 1988 to 2021 from PubMed, Google Scholar, Web of Science, Science Direct, Cochrane Library, and Worldwide Science database. The search strategy identified 309 cross-sectional studies. After screening for potentially eligible articles, we identified 37 publications for full text review, following which 10 publications were included in the final review. Using data from the review, we performed meta-analysis to produce pooled estimates and assess the prevalence of anemia and associated risk factors. Data were extracted using a standardized data extraction format prepared in Microsoft Excel™ and transferred to Stata™ Version 14.0 for management and further analysis. To identify the source of heterogeneity, subgroup analysis using sample size and study setup was computed, and  $I^2$  test was used to declare the presence or absence of significant heterogeneity during subgroup analysis. A random-effect meta-analysis model was used to estimate the pooled prevalence of adolescent girls' anemia. Moreover associated factors for adolescent anemia were assessed too.

**Results:** The overall pooled prevalence of anemia among adolescent girls' in Ethiopia was 23.02 % (95% CI: 17.21 to 28.84). In the subgroup analysis, studies that have a higher sample size than mean have a higher pooled prevalence (27.35%) (95% CI: 21.42 to 33.28) compared to their counterparts.

Age being 15-19 (OR: 2.13; 95% CI: 1.52 to 2.96), rural residence (OR: 2.05; 95% CI: 1.66 to 2.54), and low dietary diversity (OR: 1.35; 95% CI: 1.00 to 2.34), were the identified factors associated with anemia among adolescent girls'.

**Conclusion:** The pooled prevalence of anemia among adolescent girls in Ethiopia was moderately high. Being in 15-19 years, rural residence, and low dietary diversity score were found to be the significant factors of anemia among adolescent girls in Ethiopia.

**Keywords:** Anemia, Prevalence, Adolescent, Girls, Ethiopia

**Iron Status and Risk Factors of Iron Deficiency among Pregnant Women in Eastern Ethiopia: A Community-Based Study.** *Meseret Belete Fite*

**Background:** Iron is crucial for physiological processes, including hemoglobin synthesis, and cellular growth and development. In developed countries, the magnitude of iron deficiency in pregnancy is documented and the causes well studied. Nevertheless, in developing country including Ethiopia, there are gaps in the available evidence, and therefore iron status and risk factors of iron deficiency is not fully understood. The aim of this study was to assess the Iron status and risk factors of iron deficiency among pregnant women in Haramaya District, Eastern Ethiopia, 2021.

**Methods:** A community based cross-sectional study was conducted among 446 pregnant women in Haramaya District, Eastern Ethiopia. Researchers measured serum levels of ferritin at Ethiopian Public health Institute. A Log-binomial regression and liner regression analyses were used to investigate the independent variables association with iron deficiency. An adjusted prevalence ratio (APR) with 95% confidence interval was reported to show associations

**Results:** We found that about 52.91% (95% CI:48.16-57.63) of respondents were iron deficient. Over all 24.89% and 22.2% of the respondents had moderate iron depletion and iron sufficiency respectively. The prevalence of anemia and iron deficiency anemia was 45.96% (95% CI:41.32-50.71) and 28.03% (95% CI: 21.27-32.44), respectively. The risk of iron deficiency was more likely higher among respondent whose dietary diversity score was low (ARR=1.36 (95% CI=1.070-1.718). However, the risk of iron deficiency was significantly lower among those who had antenatal care follow-up (ARR=0.73 (95% CI=0.608-0.873).

**Conclusion:** Iron deficiency was frequent among pregnant women in Eastern Ethiopia. An improvement in dietary diversity and ANC follow up are very crucial by provision of comprehensive and routine nutritional assessments and counselling service; and promoting maternal nutrition, including adequate intake of diversified foods and early registration for antenatal care are suggested. We recommend the need of efforts geared to iron fortification to improve the nutritional value of foods and future further study using all the available iron biomarkers with nationally representative data.

**Key words:** Serum ferretin, Iron Deficiency, Iron Deficiency Anemia, Eastern Ethiopia

**Effects of under nutrition on Opportunistic Infections among Ethiopian Adults Living with HIV on Art: Using Inverse Probability Weighting.** *Animut Alebel Ayalew<sup>1, 2\*</sup>, Daniel Demant<sup>2, 3</sup>, Pammla Petrucka<sup>4, 5</sup>, and David Sibbritt<sup>2</sup>*

**Background:** Opportunistic infections (OIs) are the leading cause of hospitalization, morbidity, and mortality in people living with HIV (PLHIV). Despite evidence suggested that undernutrition significantly increases the risk of OIs in PLHIV, to our knowledge, no study has examined the actual effects of undernutrition on OIs in this population, particularly in low-income countries. Therefore, this study examined the effects of undernutrition on OIs in adults living with HIV on antiretroviral therapy (ART).

**Methods:** A retrospective cohort study was conducted among 841 adults living with HIV on ART between June 2014 and June 2020 at Debre Markos Comprehensive Specialized Hospital, Northwest Ethiopia. Data from the medical records of participants were extracted using a project specific data extraction checklist. The Kaplan Meier survival curve estimated the OIs free survival time. The average treatment effects (ATE) of undernutrition on time to develop OIs was estimated using inverse-probability weighting. Finally, regression coefficients with 95% confidence intervals (95% CIs) were reported, with a statistical significance of  $p < 0.05$ .

**Results:** Of the 841 study participants, 262 (31.2%) participants developed OIs, with an overall incidence rate of 16.7 (95% CI: 14.8, 18.8) per 100 person-years. The incidence of OIs in undernourished participants (21/100 person-years, 95% CI: 17.8, 27.4) was higher than well-nourished participants (15.0/100 person-years, 95% CI: 12.9, 17.4). When everyone in the population of interest is well-nourished, average time to develop OIs is estimated as 26.5 (coefficient: 26.5, 95% CI: 20.6, 32.4,  $p < 0.001$ ) months. However, when everyone is undernourished, average time to develop OIs decreases by 8.8 (coefficient: -8.8, 95% CI: -16.6, -1.0,  $p = 0.026$ ) months. Lastly, exposure to undernourishment (intervention) (ratio of ATE to well-nourished potential outcome means [POM]) in this study was a 32.5% reduction in OIs among adults living with HIV on ART.

**Conclusion:** Undernutrition significantly shortened time to develop OIs in adults living with HIV. This finding highlights the need for appropriate nutritional support and monitoring in addition to provision of ART.

**Keywords:** Adults living with HIV, Ethiopia, ART, Opportunistic infections, Undernutrition



**Incidence of Mortality and Associated Factors among Severely Malnourished Children Admitted in Gedeo Zone Health Institutions, SNNPR, Ethiopia a Prospective Follow up Study.** *Wagaye Alemu, Wagaye Alemu, Dirshaye Argaw, Mebrate Adimasu*

**Back ground:** Under-nutrition is associated with >50% of all childhood mortality in developing countries, with the risk of mortality being 5–8 fold among severely compared to moderately malnourished children. Because of the high risk of death, most severely malnourished children are managed in hospital. Unfortunately, the number of children hospitalized with severe malnutrition continues to rise in sub-Saharan Africa

**Objective:** The aim of this study is to determine incidence of mortality and associated factors among severely malnourished children admitted in Gedeo zone health institutions, SNNPR, Ethiopia, 2018

**Method:** Multicenter institution based 2 years prospective follow up study was conducted among 568 SAM patients with age <5 years in Gedeo zone health institutions. Survival analysis with Cox proportional hazard model was fitted to determine factors associated with mortality rate. Variables with p-value <0.05 in multivariate regression was considered as statistically significant determinant factors.

**Result and discussion:** From a total of 568 children admitted with SAM, almost half (55.3%) of them were males and about three-fourth (67.6%) of the participants' age was 12 to 60 months old. Among a total of 568 patients admitted with SAM; 54(9.5%), 306(53.9%), 179(31.5%) and 29(5.1%) were died, recovered, transferred out and defaulted respectively. The study cohort had contributed to a total of 6648.8 person-days of follow-up. Over the study period, the rate of mortality was eight per 1000 person-days. Co morbid after admission; (AHR 2.96; 95% CI 1.35, 6.47), being HIV reactive (AHR 1.31; 95% CI 1.12, 1.72), hospital stay for more than one week (AHR 1.78; 95% CI 1.03, 3.12), and lack of formal education of family (AHR 2.25; 95% CI 1.24, 4.08) and NG tube given were independent significant predictors of mortality.

**Conclusion:** The rate of mortality was higher and family educational status, co morbid after admission, being HIV reactive, vaccination status, hospital stay for more than one week and NG tube given were found as significant determinant factors of mortality rate.

**Keywords;** Mortality, Incidence, severe malnutrition, determinant factors

**Validation of Measurements of Knowledge and Attitude about Nutrition in Adolescent Girls in Northwest Ethiopia.** *Fantahun Ayenew Mekonnen*

**Introduction:** Nowadays, eating is becoming a well understood behavior to in determining health and related issues which in turn is highly influenced by once knowledge and beliefs about diet. Hence, there is a growing effort in measuring these very crucial factors. However, to date, there has not been a standardized measurement tool in Ethiopia, in the developing countries.

**Objective:** This study was aimed at validating a tool useful for assessing adolescent girls knowledge and attitude about nutrition

**Methods:** The tool validation has passed a number of stages to reach at this level. The tool validation began with the generation of an item pool based on reviews of various literatures. Experts with different qualifications and experiences were involved to evaluate the tool in terms item comprehensiveness and relevance and hence item and scale level content validity indexes were calculated. Following, cognitive interview was carried out among 30 adolescent school girls to understand items' face validity. To assess its psychometric property, the tool was administered among 1038 adolescent girls in 12 schools in Northwest Ethiopia from December, 2020 to January, 2021. Item facility/discrimination indexes were calculated. Exploratory factor analysis was done to determine the factor structure of the scale and hence eigenvalue and scree test were employed. Cronbach alpha was calculated to assess the factor and scale level reliability of the tool. Finally, generalized structural equation modeling was employed. Model fitness was first assessed and structural and item level parameters were then calculated. Stata 14 was used for the analysis.

**Results:** Twenty three items on knowledge about nutrition and 30 items on attitude about nutrition remained for the exploratory and confirmatory factor analyses out of a total of 50 and 61 items, respectively. The exploratory factor analysis resulted a single factor for knowledge about nutrition construct. And the scale was found to be reliable (cronbach alpha =0.75). The exploratory factor analysis for the attitude about nutrition resulted was attitude about resulted in three factors. And the scale and factors were reliable (Scale level cronbach alpha= 0.77). The confirmatory factor analysis showed that the model was adequate and all the 23 knowledge and 30 attitude item were significant at alpha value of 0.05. knowledge is also found to predict attitude.

**Conclusion and recommendation:** The knowledge and attitude instruments were found to valid and reliable. So, we recommend researchers interested in studying adolescents dietary behavior, knowledge and attitude use this instrument. The instruments can also be used as a foundation for the development of tools in related fields.

## Health Literacy and Health Behaviors:

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### **Adherence to Non-Pharmaceutical Interventions towards COVID19 and Associated Factors among Residents of Shashemane, Central Ethiopia.** *Adane Tesfaye Anbesse*

**Introduction:** COVID-19 pandemic can seriously affect African nations because of the weak health care system, crowding, poor hygiene in the cities, and the random mobility of people. Hospital-based interventions are not a good choice for resource-scarce countries which have shortages of hospital beds, ventilators, and oxygen; rather practicing preventive measures at a community level is the best strategy. There is a shortage of evidence about current public adherence with COVID-19 preventive strategies in Ethiopia, therefore this study helps to target health education messages to groups of populations with poor compliance to specific prevention measures, which also contribute to decreasing the magnitude and duration of the pandemic.

**Methods:** A Community based cross-sectional study was done on 405 participants selected by systematic random sampling in Shashemane. Data was collected using A pretested structured tool comprising socio-demographic characteristics, knowledge, attitude, and adherence with COVID-19 prevention practice. Participants who practiced  $\geq 75\%$  of the COVID-19 preventive practices were labeled as having “good adherence”. Bivariate and multivariable logistic regression was used to determine the associated variables. Odds ratios along with 95%CI were estimated to identify associated factors and a level of statistical significance was decided at p -value less than 0.05.

**Result:** The practice of COVID-19 preventive measures was 19.5%, (95% CI: 15–24.5%). Having a favorable attitude (AOR = 5, 95% CI: 3.3 – 8.41), having good knowledge of the disease (AOR =3, 95% CI: 2.74– 9.3) and educational status (Diploma and above) (AOR =5.5, 95% CI: 2– 9.39) were significantly associated factors with the practice of COVID-19 preventive measures.

**Conclusion:** The Adherence to COVID-19 preventive practices was very low, educational status above Diploma, good knowledge, and Favorable attitude were the factors positively and independently associated with good adherence to Covid-19 prevention practices. Behavioral change communication and Strict government law and implementing it are highly required.

**Key word-** [Adherence, COVID-19, Practices, Shashemane, Ethiopia]

## Health System

Abs 30

### **Impact of Early Chest Radiography on Delay in Pulmonary Tuberculosis Case Notification in Ethiopia.** *Hussen Mohammed*

**Background:** One-third of tuberculosis (TB) cases are missed each year and delays in the diagnosis of TB are hampering the whole cascade of care. Early chest radiography (CXR) in patients with cough irrespective of duration may reduce TB diagnostic and treatment delays and increase the number of TB patients put into TB care. We aimed to evaluate the impact of CXR on delay in the diagnosis of pulmonary TB (PTB) among people with cough of any duration.

**Methods:** A facility-based cross-sectional study was conducted in four selected health facilities from two regions and two city administrations of Ethiopia. Patients who sought health care were screened for cough of any duration, and those with cough underwent CXR for PTB and their sputum specimens were tested for microbiological confirmation. Delays were followed up and calculated using median and inter-quartile range (IQR) to summarize (first onset of cough to first facility visit,  $\geq 15$  days), diagnosis delay (first facility visit to date of PTB diagnosis,  $> 7$  days), and total delay (first onset of cough to date of PTB diagnosis,  $> 21$  days). Kruskal-Wallis and Mann-Witney tests were used to compare the delays among independent variables.

**Results:** A total of 309 pulmonary TB cases were consecutively diagnosed of 1853 presumptive TB cases recruited in the study that were identified from 2647 people who reported cough of any duration. The median (IQR) of patient delay, diagnosis delay, and the total delay was 30 (16-44), 1 (0-3), and 31 (19-48) days, respectively. Patients' delay contributed a great role in the total delay, 201/209 (96.2%). Median diagnosis delay was higher among those that visited health center, diagnosed at a facility that had no Xpert MTB/RIF assay, radiologist, or CXR ( $p < 0.05$ ). Factors associated with patients delay were history of previous TB treatment (aPR [adjusted Prevalence Ratio] = 0.79, 95% CI: 0.63-0.99) and history of weight loss (aPR = 1.12; 95% CI: 1.0-1.25). Early CXR screening for cough of  $< 2$  weeks duration significantly reduced the patients' delay and thus the total delay, but not diagnostic delay alone

**Conclusion:** Early screening using CXR minimized delays in the diagnosis of PTB among people with cough of any duration. Patients' delay was largest and contributed great role in the delay of TB cases. Screening by cough of any duration and/or CXR among people seeking healthcare along with ensuring the availability of Xpert MTB/RIF assay and skilled human power at primary healthcare facilities are important to reduce patient and diagnostic delays of PTB in Ethiopia.

**Keywords:** Tuberculosis, Chest radiography (CXR, X-ray), Xpert MTB/RIF assay, Screening, Active case-finding, Delay, Diagnosis, Ethiopia

**The Promise of the New Educational Strategy for Curriculum Development (SPICES) Model on the Development of Students' Clinical Reasoning Ability. A Comparative Cross-Sectional Study.** *Ekulinet Misganaw Amare*

**Introduction:** Clinical reasoning skills are a core competency that must be taught at all levels of health-care education. In the last decade, several health professional education curricula in Ethiopia have been redesigned with the goal of improving student competence in key health-care delivery skills. Despite the fact that some academic programs followed the conventional educational strategy, a significant number of academic programs adopted a new educational strategy for curriculum development: Student-centered, Problem-based, Integrated, Community-based, Elective, and Systematic (SPICES) model. More empirical evidence, however, is required to determine whether the new curricular approach is effective in improving students' clinical reasoning. The purpose of this study is to determine whether the new educational strategy for curriculum development improves the clinical reasoning ability of midwifery students when compared to a peer institution that follows a traditional curriculum.

**Methods:** A comparative cross-sectional study was conducted to compare the clinical reasoning skills of midwifery students who completed the new curricular approach versus students who completed a traditional curriculum. A Script Concordance Test (SCT) was used to collect data. The mean SCT score and an independent two-sample *t*-test were calculated to see if the two groups differed significantly in terms of clinical reasoning skills in managing Post-Partum hemorrhage (PPH).

**Results:** A total of 77 final-year midwifery students participated (38 from the new and 39 from the traditional curriculum approach). Midwifery students who completed the new and conventional curriculum approaches had mean clinical reasoning SCT scores of 0.7 (SD = 0.35) and 0.53 (SD = 0.37), respectively. There was a statistically significant difference in the overall mean SCT score between the two study groups in terms of clinical reasoning skills ( $p = 0.008$ ).

**Conclusion:** Our study found that the new SPICES model curricular approach is promising in fostering the development of clinical reasoning skills of Midwifery students in managing PPH.

**Keywords:** clinical reasoning skills, Ethiopia, midwifery, post-partum hemorrhage, SPICES model Curriculum

**Factors Associated with Community Based Health Insurance Healthcare Service Utilization of Households in South Gondar Zone, Amhara, Ethiopia.;A community based cross-sectional study. Yikeber Abebaw Moyehodie**

**Background:** In Ethiopia, community-based health insurance was implemented to promote equitable access to sustainable quality health care and increase financial protection. Despite the efforts made by the government, the community-based health insurance health care service utilization rate still failed to achieve the expected goal. The purpose of this study was to identify factors associated with community-based Health Insurance Healthcare Service Utilization of Households in the South Gondar Zone.

**Method:** A community-based cross-sectional study was employed. Data were collected among 619 randomly selected households in the south Gondar zone. Chi-square and binary logistic regression analyses with a P-Value of less than 0.05 were used to determine the association.

**Results:** Out of the total households, 511(82.6%) were using the CBHI scheme for health care service utilization. Urban residence (AOR= 0.018; 95%CI: 0.01, 0.05), marital status (divorced and widowed (AOR=0.35; 95%CI: 0.02, 0.99)), education level (primary (1-8) (AOR= 9.44; 95%CI: 2.19, 5.82); secondary (9-12) (AOR= 50.43; 95%CI: 3.73, 2142.25); college and above (AOR= 13.31; 95%CI: 1.72, 300.28)), occupation status (others (AOR= 0.21; 95%CI: 0.08,0.52), family size (3 up to 5(AOR= 2.81; 95%CI: 1.19, 6.67; greater than five(AOR= 2.95; 95% CI: 1.13, 7.93)), presence of under five children in the households (no (AOR= 0.32; 95%CI: 0.16, 0.61)), presence of elders in the households (No (AOR= 0.33; 95%CI: 0.13, 0.76)), nearest health institution (health center (AOR=2.52; 95%CI: 1.21, 5.29)), presence of chronic illness in the household's (No (AOR= 0.37; 95%CI: 0.15,0.85)), Time taken to reach health institution (61 up to 120 minutes(AOR= 0.36; 95%CI: 0.16,0.99)); greater than 120 minutes (AOR= 0.29; 95%CI: 0.08,9.91)), attitude of household towards CBHI scheme (positive attitude (AOR= 2.46; 95%CI: 1.056, 6.22)) significantly determined the CBHI scheme health care service utilization of household's.

**Conclusion:** Residence, marital status, education level, occupation status, family size, presence of under-five children in the household, presence of elders in the households, nearest health institution, presence of chronic illness in the household's, time taken to reach health institution, an attitude of a household were the determinant factors of community-based health insurance scheme health care service utilization of households.

**Turn-Over Intention and Associated Factors among Health Professionals in Health Facilities Of Kafa Zone, South West Ethiopia, South West Ethiopia. Tilahun Mekonnen Regassa**

**Background-** *Employee turnover is harmful to a company's bottom line, costing time, money, and valuable resources. The studies also indicated that turnover intention of health professionals is high in Ethiopia: but there is paucity of information about turnover intention of health profession in study area*

**Objective-** Turnover Intention and its associated Factors among Health Professionals in Kafa Zone, South West, Ethiopia, 2019.

**Methods-** Institutional based cross sectional study design with quantitative data collection was employed from May 01 – 30/2019. A total sample size was 427 and the participants were selected by using simple random sampling technique from selected health facilities. Epi Data Statistical software version 3.1 and Statistical Package for Social Sciences (SPSS) software version 21.0 were used for data entry and analysis. Binary Logistic regression analysis was used to identify factors associated to turnover intention. Odds ratios with 95 % confidence intervals were used to examine associations between dependent & independent variables. P. value less than 0.05 was considered significant.

**Result-** Four hundred twenty seven questionnaires were distributed, and 389 were returned that makes response rate of 91.1%. Majority 324 (83.3%) of the respondents were between 21-30 age and more than half 210 (54%) were male. More than half 219(56.3%), 95% CI of the respondents reported that they intended to leave the organization. Being female [AOR 2.65, 95% CI (1.62-4.33)], Being married [AOR 0.57, 95% CI (0.34-0.96)], Degree holder in educational status [AOR 0.55, 95% CI (0.34-0.89)], autonomy [AOR 0.51, 95% CI (0.31-0.84) and living place condition [AOR 1.68, 95% CI (1.0-2.83)] were found to have statistically significant association with intention to leave among health professionals in the study area.

**Conclusion:** High number of health professionals intended to leave their organization. Sex, educational status, marital status, autonomous and living place condition were the identified predictors of Turnover intention among health professionals. The health managers and stakeholders at different level should have discussion session with staffs to reduce the Turn over intension.

### **Willingness to Accept COVID-19 Vaccination in Ethiopia.** *Sisay Abebe*

**Background:** A dozen of vaccines have been approved against COVID-19 and start rolling out. However, the public knowledge, perception, and attitudes that lead to communal vaccine hesitance are poorly understood. This study aimed at investigating the public perception and attitude towards the COVID-19 vaccine and its acceptance in Ethiopia.

**Method:** From August 1 to 31, 2021, a web-based cross-sectional community survey of 1,143 individual participants was conducted. Both descriptive statistics and bivariate followed by multivariable logistic regression analyses were performed to identify the variables predicting COVID-19 vaccination.

**Result:** The COVID-19 vaccination acceptance rate was 61.4% (702). Male respondents (69%) are more likely to be vaccinated than females, while single respondents are more hesitant than married participants. The higher the income of the participant the more likely they accept the vaccine, which is true for the education level too. Non-health sector workers are more likely to get vaccinated (65%) than health sector workers (55%) if it is freely available. The public mainstream media and social media are the main trusted information sources. More than 88% of the respondents rate their own COVID-19 knowledge as good/excellent while 67.7% exhibit good/excellent knowledge of the vaccine. Only 30% believe they can effectively protect themselves through taking the vaccine, though 66% believe the vaccine is not dangerous, while 39% of the respondents do not trust the vaccination process in the country; 20% think the vaccine can lead to infertility and 34% believe the vaccine can be used to track their data. About 44% believe the vaccine development process was rushed, while 30% think the vaccine is unsafe. Respondents who believe the COVID-19 vaccine is more dangerous than COVID-19 itself were 62.5 times less likely willing to accept COVID 19 vaccine as compared with those who reported being confused regarding the effectiveness of the vaccine (AOR=0.375, 95% CI= (.230-.611)).

**Conclusion:** Since the vaccine acceptance rate of 61.4% is not high enough the government should focus on creating awareness and clearing the public confusion to secure successful vaccination.

**Key Words:** Attitude, Perception, COVID-19 Vaccine, Ethiopia,



**Vaccination Timeliness and Associated Factors among Children Aged 12-23 Months In Jabitehnan District, West Gojjam Zone, Northwest Ethiopia.** *Bekalu Endalew Alamneh*

**Background:** vaccines are the most effective preventive and success of public health to control and eradicating serious childhood diseases. Both early and delay in childhood vaccination can result failure of generating antibody against the diseases. However, evidences on childhood vaccination timeliness are limited in developing countries including Ethiopia.

**Objective:** This study is aimed to assess vaccination timeliness and associated factors among children aged 12 to 23 months in Jabitehnan district, West Gojjam zone, Northwest Ethiopia, 2020.

**Methods:** A community based cross-sectional study was conducted in Jabitehnan district from 28 February to 18 March 2020. A total of 548 children aged 12-23 months were included using stratified multi-stage sampling technique. Data were collected by Interviewer administered semi-structured questionnaire. Binary logistic regression model was fitted to identify factors and adjusted odd ratio (AOR) with 95% CI was used to declare statistically significant variables and to estimate strengths of association with vaccination timeliness.

**Result:** A total of 71(13.1% with 95%CI: 10.1-15.8) of children were received vaccines in the recommended time interval. Higher level of maternal education (AOR: 2.73; 95% CI: 1.14-6.50), history of abortion (AOR: 3.45; 95%CI: 1.54-7.74), knowledge (AOR: 1.79; 95%CI: 1.10-3.18) and favorable attitude (AOR: 3.38; 95%CI: 1.83-6.24) were positively associated with vaccination timeliness. While home delivery (AOR: 0.35; 95%CI: 0.18-0.68) and rural residence (AOR: 0.31; 95%CI: 0.14-0.65) were negatively associated with vaccination timeliness.

**Conclusion:** The overall childhood vaccination timeliness status was low in the study area. Children were received the first dose of OPV, Penta, PCV and Rota vaccines within recommended time relatively higher than the other doses/vaccines. Moreover, children received measles vaccine earlier and BCG vaccine later than the acceptable time interval. Variables such as residence, maternal level of education, having history of abortion, place of delivery, knowledge and attitudes were affecting vaccination timeliness. Therefore, concerned bodies better to enhancing women education; invest an effort on knowledge, and attitudes of mothers and on promotion of institutional delivery.

**Spatial Patterns and Inequalities in Skilled Birth Attendance and Caesarean Delivery in Sub-Saharan Africa.** *Firew Tekle Bobo*

**Background:** Improved access to and quality obstetric care in health facilities reduces maternal and neonatal morbidity and mortality. We examined spatial patterns, within-country wealth-related inequalities and predictors of inequality in skilled birth attendance and caesarean deliveries in sub-Saharan Africa.

**Methods:** We analyzed the most recent Demographic and Health Survey (DHS) data from 25 sub-Saharan African countries. We used the concentration index (CCI) to measure within-country wealth-related inequality in skilled birth attendance and caesarean section. We fitted a multilevel Poisson regression model to identify predictors of inequality in having skilled attendant at birth and caesarean section.

**Results:** The rate of skilled birth attendance ranged from 24.3% in Chad to 96.7% in South Africa. The overall coverage of caesarean delivery was 5.4% (95% CI: 5.2% to 5.6%), ranging from 1.4% in Chad to 24.2% in South Africa. The overall wealth-related absolute inequality in having a skilled attendant at birth was extremely high, with a difference of 46.2 percentage points between the poorest quintile (44.4%) and the richest quintile (90.6%). In 10 out of 25 countries, the caesarean section rate was less than 1% among the poorest quintile, but the rate was more than 15% among the richest quintile in nine countries. Four or more antenatal care contacts, improved maternal education, higher household wealth status, and frequently listening to the radio increased the rates of having skilled attendant at birth and caesarean section. Women who reside in rural areas and those who have to travel long distances to access health facilities were less likely to have skilled attendant at birth or caesarean section.

**Conclusions:** There were significant within-country wealth-related inequalities in having skilled attendant at birth and caesarean delivery. Efforts to improve access to birth at the facility should begin in areas with low coverage and directly consider the needs and experiences of vulnerable populations.

**What Could Be the Best Approach to Revitalize Ethiopia's Rural Health Extension Program (hep)? Findings of a Longitudinal Qualitative Study.** *Taddese Alemu Zerfu*

**Background:** The HEP was designed to be an innovative, community-based, and household-focused health service delivery program-addressing majority of preventable health problems of the grassroot community. Despite significant gains, mounting level of evidence indicates that, HEP is confronting constraints, necessitating a fresh look at program reform. Therefore; in the present study, we aimed to explore the major challenges and experience of the rural HEP in rural context of Ethiopia, using a longitudinal study approach.

**Methods:** This study is a continuation of a larger cluster randomized trial (RCT) that was implemented in Gedeo zone. Annexed to the RCT; we employed a longitudinal qualitative study design to collect comprehensive data on barriers, experiences and shortcomings of HEP, through a close follow-up of actual program implementation for two years. Observations were made weekly by onsite supervisors and analysed monthly through feedback and iteration by investigators using an observation checklist. Thematic answers were created by condensing, summarizing, and synthesizing data collected in the field in the form of extended notes and field observation checklists.

**Result:** A total of 264 serial field observations and 16 interviews were conducted with experts and community based reproductive health nurses (CORN) who were new experimental cadres deployed at grass root level (health post), providing skilled maternity services to rural mothers. Likewise; irrespective of the harnessed successes in availing essential health service packages to the rural community, HEP was seen to have several flaws. Some of the major flows identified included interventions that were missed or unfittingly addressed, a lack of skilled as well as essential curative care for women and children, a lack of service for men and other population groups, weak integration with other relevant sectors, lack of male involvement, and incorrectly assigned means of service distribution.

**Conclusion:** To ensure long-term viability and benefit to those in need, the HEP should be revitalized such that the packages of services, the means of distribution, and target population served are all tailored to the community's needs.

**Key words:** *HEP, challenges, revitalisation, longitudinal*

**COVID-19 Vaccine Hesitancy among Medical and Health Science Students attending Wolkite University in Ethiopia.** *Ayenew Mose Abawa*

**Background:** Medical and health science students are among the frontline health care workers who are at high risk of acquiring COVID-19 infection during their clinical attachments and future career. As health care providers, they are expected to promote and administer the COVID-19 vaccine and counsel vaccine-hesitant patients. It is therefore imperative to assess COVID-19 vaccine hesitancy among medical and health science students. Thus, this study aimed to assess COVID-19 vaccine hesitancy and its associated factors among medical and health science students of Wolkite University.

**Method:** An institutional-based cross-sectional study design was conducted among 420 medical and health science students attending Wolkite University from March 1 to 30, 2021. Simple random sampling technique was used to select study participants. Self-administered and structured questionnaires were used to collect data. Data were entered into Epi-Data version 4.2.0 and exported to SPSS version 23 software package for analysis. Bivariable and multivariable analysis was used to identify associated factors. P values <0.05 result were considered as a statistically significant association.

**Results:** The level of COVID-19 vaccine hesitancy was 41.2% (95% CI; 35.2%-50.4%). Student age < 23 years were 1.9 times more likely vaccine hesitant [aOR= 1.94, 95% CI; 1.14-3.28], being female were 1.7 times more likely vaccine hesitant [aOR=1.76, 95% CI; 1.14-2.72], resided in rural area were 1.6 times more likely vaccine hesitant [aOR=1.63, 95% CI; 1.06-2.49], source of information from social media were 2.7 times more likely vaccine hesitant [aOR=2.68, 95% CI; 1.58-4.54], and good practice to COVID-19 mitigation measures were 47% less likely vaccine hesitant [aOR=0.53, 95% CI; 0.34-0.83].

**Conclusions:** COVID-19 vaccine hesitancy is found to be high. Therefore, students are advised to receive COVID-19 vaccine information from government lead mass media (i.e. television and radio), increase awareness, and adherence to COVID-19 mitigation measures is recommended.

### **Molecular Detection of Drug-Resistant *Mycobacterium Tuberculosis* Isolates from Subjects with Symptoms of Pulmonary Tuberculosis Attending Spiritual Holy Water Sites in Amhara Region, Ethiopia.** *Melese Abate Reta*

**Background:** Tuberculosis (TB) continues to be a leading cause of infectious disease-related death. The emergence of drug-resistant TB (DR-TB) is one of the major hurdles for TB control efforts, particularly in developing nations like Ethiopia. This study aims to assess the patterns of anti-TB drug resistance among *Mycobacterium tuberculosis* (*Mtb*) isolates from subjects with symptoms of pulmonary TB (PTB) attending spiritual holy water sites in the Amhara region, Ethiopia.

**Methods:** A cross-sectional study was conducted at nine holy water sites (HWS) between June 2019 and March 2020. In total, 560 PTB suspected holy water attendees have participated. Sputum samples were collected using a leak-proof sterile collection container and the mycobacterial culture was done using Lowenstein-Jensen (LJ) culture techniques following standard procedures. Molecular detection of DR-TB was performed using GenoType<sup>®</sup>MTBDR*plus* version 2 and GenoType<sup>®</sup>MTBDR*sl* version 2 assays.

**Results:** Among 560 PTB suspects, 21.8% (122/560) were bacteriologically confirmed cases, and all 122 culture-positive isolates were tested for drug resistance. Of those, 102 (83.6%) were susceptible to both rifampicin (RIF) and isoniazid (INH), and 20 (16.4%) were resistant to at least one of the two drugs. Any RIF and INH resistance rate was 15 (12.3%) and 20 (16.4%), respectively. Multi-drug-resistant TB (MDR-TB: resistant to both RIF and INH) was 15 (12.3%). Five of the 20 INH-resistant isolates were INH-mono-resistant. Five of the 15 MDR-TB isolates were pre-extensively drug-resistant TB (pre-XDR-TB).

The study area and participants' age were both significant predictors of the development of any DR-TB and MDR-TB. Participants aged 18-33 years had the highest risk of getting any DR-TB, with a rate of 47.06%  $\pm$  12.11%SE (95%CI 24.33-71.08%), and 58.33 $\pm$ 14.23 $\pm$ SE (95%CI 28.51-83.09%) for MDR-TB. The South Wollo zone is the most affected area for any DR-TB (odds ratio (OR)=14.54; 95%CI 1.65-128.44;  $p$ =0.016), and MDR-TB (OR=11.99; 95%CI 1.35-106.80;  $p$ =0.026), when compared to other study sites.

Among the 15 RIF-resistant, 12 (80%) showed absent *rpoB*WT8 band along with the gene mutation at *rpoB*MUT3 (Ser531Lue). One RIF resistant isolate showed an absent *rpoB*WT7 band along with mutation at *rpoB*MUT2A (His526Tyr). From the 20 INH-resistant, 19 (95%) had mutations in the *katG* gene (*katG*MUT1 and Ser315Thr1), whilst five INH-mono-resistant showed absent *katG*WT1 band with an associated gene mutation at Ser315Thr1. Of the total 15 MDR-TB, 12 (80%) showed mutations at both *rpoB*MUT3 (Ser531Leu) and *katG*MUT1 (Ser315Thr1). All five pre-XDR-TB isolates missed *rpoB*WT8, *katG*WT, and *gyrA*WT3 probes with the corresponding gene mutations of *rpoB*MUT3(S531L), *katG*MUT1(S315T1), and *gyrA*MUT3A (Asp94Ala), respectively.

**Conclusions:** The high prevalence of DR-TB among individuals with TB symptoms attending spiritual HWS in the study area is alarming and should draw the attention of the national TB prevention program. This study demonstrated that the young age group (18-33 years) and the South Wollo zone study area require special attention to reduce the spread of DR-TB strains. Implementing regular systematic TB screening of individuals at the HWS, detection of ant-TB drug resistance, proper follow-up of TB patients, and health education are all necessary.

**Serum Magnesium Level in Pre-Eclamptic and Normotensive African Pregnant Women: A Systematic Review and Meta-Analysis.** *Endalamaw Tesfa Damtie*

Some studies have reported low serum Magnesium (Mg) level in pre-eclamptic women as compared to normotensive pregnant women. However, few studies have reported high serum Mg level in pre-eclamptic women. Therefore, to resolve this controversy, this systematic review and meta-analysis was performed. PubMed, Hinari, Google Scholar, and African Journals Online electronic databases were searched for studies published in English. Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument and Newcastle-Ottawa Scale were used for data extraction and quality assessment of the included studies. The meta-regression analysis was performed by Stata 14 software. The mean and standardized mean difference (SMD) of serum Mg level was computed to evaluate their association with pre-eclampsia at 95% certainty level. A total of 23 observational studies were included. The mean serum Mg level was significantly lower in pre-eclamptic women ( $\text{Mg} = 0.89 \pm 0.72 \text{ mmol/L}$ ) than normotensive pregnant women ( $\text{Mg} = 1.16 \pm 1.02 \text{ mmol/L}$ ). The pooled SMD of Mg was significantly reduced in pre-eclamptic women as compared with normotensive pregnant women with the SMD of -0.89 (95% CI: -0.97, -0.80). In this review, we found that the serum Mg level was significantly reduced in pre-eclamptic women compared to normotensive pregnant women. This suggests that, Mg could be involved in the etio-pathogenesis of pre-eclampsia. However, the specific functions of Mg in pre-eclampsia pathogenesis should require large scale clinical trial and prospective cohort studies.

**Levels of Lipid Alterations and their Association with COVID-19 Disease Severity among Patients Admitted at Millennium COVID-19 Care Center in Ethiopia, Horn of Africa.** *Yakob Gebregziabher Tsegay*

**Background:** Current studies have presented and analyzed epidemiological, clinical and clinical laboratory features COVID-19 Patients. Studies suggests that patients with severe COVID-19 shows unregulated lipid metabolism and profile but adequate information is not available concerning the association of lipid parameter features with severity of disease its outcome in Ethiopia.

**Objective:** This study aims to determine the magnitude of lipid profile abnormalities and association of COVID-19 outcome among admitted patients at Millennium COVID-19 care center in Ethiopia.

**Methods:** A prospective observational cohort study was conducted among COVID-19 admitted patients to investigate lipid profile parameters from January 2021- June 2021. A total of 500 patients confirmed with COVID-19 infection by RT-PCR were included. Dynamic alteration in lipid profiles were recorded and tracked. Data were analyzed using SPSS version 25. P value <0.05 was considered significantly associated.

**Result:** The median age of the 500 study participants was 55.58±7.707 years, and from these 71.3% of patients were males. This study found that high-density Lipoprotein cholesterol (HDL-C) and Total Cholesterol levels were significantly higher in the severe and Critical disease category. The total cholesterol results showed that significantly higher 25 (5.38%) in severe infection cases than that, (17 (3.4%), 12(2.4%) and 5 (1%) in moderate, mild and critical cases consecutively (P<0.000). Whereas, patients with severe infection had slightly lower of HDL than Mild and moderate infection cases (P=0.000 and P=0.000) respectively. Moreover, a significant decrement in the level of TG was detected in severe infection cases compared to mild and moderate cases (P=0.0001). Hence, the higher TG/HDL-C ratio (3.754) was found in severe infection cases, compared with mild and moderate infection (P=0.001 and P=0.002) respectively.

**Conclusion:** Lipid function biomarkers like CHO, TG and LDL serum value was found elevated among severe than other patients. Lipid Metabolism biomarkers are a candidate for predicting COVID-19 disease severity in order to guide clinical care and general Public.

**Keywords:** COVID-19, Lipid Profile, LDL-C, CHOL, TG, Addis Ababa, Ethiopia

## **Prevalence of Cryptococcal Antigenemia and Associated Factors among HIV/AIDS Patients on Second-Line Antiretroviral Therapy at Two Hospitals in Western Oromia, Ethiopia.**

*Hylemariam Mihiretie Mengist*

**Background:** Cryptococcosis is a public health important infectious disease globally. HIV infection is the main risk factor, accounting for 95% of cases in the middle- and low-income countries and 80% of cases in high-income countries. The main aim of the study was to assess the prevalence and associated risk factors of *Cryptococcal antigenemia* (CrAg) among HIV Positive Patients on second-line ART Therapy at Ambo General Hospital and Nekemte Referral Hospital, Western Oromia, Ethiopia.

**Materials and Methods:** The Hospital-based Cross-sectional study was conducted from September 1, 2017, to October 30, 2017. Whole blood was tested for CrAg using Cryptococcal lateral flow assay (Immuno-Mycologics, Norman, OK, USA) according to the manufacturer's instructions. Then the collected data was analyzed using SPSS version 20 software. Binary logistic regression models were applied to assess the association between predictors and outcome variables at 95% CI.

**Result:** Among the study participants, 115(62.8%) were females, 64(35%) were in 29-38 age group and 97(53%) were married, 169(92.3%) lived with HIV for >67 months since diagnosed for HIV, 124(67.8%) stayed on 2<sup>nd</sup> line ART for an average of 30 months. The overall prevalence of *Cryptococcal Antigenemia* infections among HIV-infected patients on 2<sup>nd</sup> line ART was 7.7%. Among *Cryptococcus* infected participants, being male [AOR, 95% CI: 4.78(1.14, 20.1)], poor adherence to ART [AOR, 95% CI: 0.12(0.03, 0.4)], occupational exposures to contaminated soil [AOR, 95% CI: 6.81(1.38, 33.4)], having non-separated house from hens or chickens [AOR, 95% CI: 0.06(0.01, 0.51)], CD4 T cell/ $\mu$ L<100 counts [AOR, 95% CI: 6.57(1.9, 23.3)] and viral load>1000 copies/mL [AOR, 95% CI: 11.7(2.4, 57.8)] were significant predictors of *cryptococcal antigenemia*.

**Conclusion:** The prevalence of *Cryptococcal Antigenemia* was significantly high. Being male, occupations that exposure to contaminated soil with avian droppings, CD4 T cell/ $\mu$ L<100 and viral load >1000 copies/mL were significant predictors of *cryptococcalantigenemia*. Therefore, public health measures, adherence to ART and early treatment are recommended.



**Bacterial Isolates, Antimicrobial Susceptibility Pattern and Associated Factors of External Ocular Infections among Patients attending Eye Clinic at Debre Markos Comprehensive Specialized Hospital, Northwest Ethiopia.** *Tebelay Dilnessa Mekuriaw Zewodie Haile<sup>1, 2</sup>, Hylemariam Mihiretie Mengist<sup>2\*</sup>, Tebelay Dilnessa<sup>2\*</sup>*

<sup>1</sup>*Department of Medical Microbiology Laboratory, Debre Markos Comprehensive Specialized Hospital, Debre Markos, Ethiopia, P. O. Box 37*

<sup>2</sup>*Department of Medical Laboratory Sciences, College of Health Sciences, Debre Markos University, Debre Markos, Ethiopia, P. O. Box 269*

**Background:** Ocular disease is a major public health problem with significant impacts on the quality of patients' life particularly in developing countries. External eye infection due to bacteria can lead to reduced vision and blindness. Therefore, early pathogen isolation and antimicrobial susceptibility testing are very crucial to tackling the disease.

**Objective:** The main aim of this study was to assess bacterial isolates, antimicrobial susceptibility pattern, and associated factors of external ocular infection (EOI) among patients attending the eye clinic at Debre Markos Comprehensive Specialized Hospital (DMCSH), Northwest Ethiopia

**Method:** A cross-sectional study was conducted in patients with external ocular infections from January to June 2021 at DMCSH. Sociodemographic and clinical data were collected using structured questionnaires. Following standard protocols, external ocular swabs were collected, inoculated onto appropriate culture media, and bacterial isolates were further identified by biochemical tests. Antimicrobial susceptibility test was done by the modified Kirby-Bauer disk diffusion technique according to Clinical and Laboratory Standards Institute (CLSI) guideline. Data were entered in EPI data and exported to SPSS version 22 for analysis. Binary logistic regression was fitted to show the association between predictors and outcome variables. *P*-values  $\leq 0.05$  were considered statistically significant.

**Results:** A total of 207 study participants were enrolled in this study. The majority (57.5%, 119/207) of them were males while 37.7% (78/207) of them were  $\geq 65$  years old. A total of 130 (62.8% prevalence) bacterial isolates were identified with the predominance of Gram-positive bacteria, 78.5% (102/130). *S. aureus* was the commonest isolate accounting for 46.2% (60/130). Most Gram-positive and Gram-negative bacteria were sensitive to ciprofloxacin. However, 83.3% (85/102) of Gram-positive bacteria showed resistance to at least one drug. The prevalence of culture-confirmed bacteria was significantly associated with age (15-64 years) ( $P \leq 0.05$ ), being farmer (AOR: 5.33, 95% CI: 1.04-37.33;  $P= 0.045$ ), previous history of eye surgery (AOR: 5.39, 95% CI: 1.66-17.48;  $P=0.005$ ), less frequency of face washing (AOR: 5.32, 95% CI: 1.31-7.23;  $P= 0.010$ ) and face washing once a day (AOR: 3.07, 95% CI: 1.13-25.13;  $P= 0.035$ ).

**Conclusion:** The prevalence of culture-confirmed bacteria in EOI patients was high in the study area. Age, occupation, history of eye surgery, and frequency of face washing were factors significantly associated with culture-confirmed bacterial prevalence. A considerable proportion of bacterial isolates exhibited mono and/or multi-drug resistance. Routine isolation and antibiotic susceptibility testing should be practiced in the study area to combat the emergently increasing bacterial antibiotic resistance.

**Keywords:** Bacterial isolate; external ocular infections; antimicrobial susceptibility pattern

**Prevalence and Antimicrobial Resistance Pattern of *Clostridium Difficile* among Hospitalized Diarrheal Patients: A Systematic Review and Meta-Analysis.** *Tebelay Dilnessa Mekuriaw* **Tebelay Dilnessa**<sup>1, 2\*</sup>, *Alem Getaneh*<sup>2</sup>, *Workagegnehu Hailu*<sup>3</sup>, *Feleke Moges*<sup>2</sup> and *Baye Gelaw*<sup>2</sup>

<sup>1</sup>*Department of Medical Laboratory Sciences, College of Health Sciences, Debre Markos University, Debre Markos, Ethiopia, E-mail: tebelay@gmail.com*

<sup>2</sup>*Department of Medical Microbiology, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia,*

<sup>3</sup>*Department of Internal Medicine, College of Medicine and Health Sciences, University of Gondar, Gondar, Ethiopia*

**Background:** *Clostridium difficile* is the leading cause of infectious diarrhea that develops in patients after hospitalization during antibiotic administration. It has also become a big issue in community-acquired diarrhea. The emergence of hypervirulent strains of *C. difficile* poses a major problem in hospital-associated diarrhea outbreaks and it is difficult to treat. The antimicrobial resistance in *C. difficile* has worsened due to the inappropriate use of broad-spectrum antibiotics including cephalosporins, clindamycin, tetracycline, and fluoroquinolones together with the emergence of hypervirulent strains.

**Objective:** To estimate the pooled prevalence and antimicrobial resistance pattern of *C. difficile* derived from hospitalized diarrheal patients, a systematic review and meta-analysis was performed.

**Methods:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline was followed to review published studies conducted. We searched bibliographic databases from PubMed, Scopus, Google Scholar, and Cochrane Library for studies on the prevalence and antimicrobial susceptibility testing on *C. difficile*. The weighted pooled prevalence and resistance for each antimicrobial agent was calculated using a random-effects model. A funnel plot and Egger's regression test were used to see publication bias.

**Results:** A total of 15 studies were included. Ten articles for prevalence study and 5 additional studies for antimicrobial susceptibility testing of *C. difficile* were included. A total of 1967/7852 (25%) *C. difficile* were isolated from 10 included studies for prevalence study. The overall weighted pooled proportion (WPP) of *C. difficile* was 30% (95%CI:10.0- 49.0;  $p<0.001$ ). The analysis showed substantial heterogeneity among studies (Cochran's test= 7038.73,  $I^2=99.87\%$ ;  $p<0.001$ ). The weighed pooled antimicrobial resistance (WPR) were: vancomycin 3%(95%CI:1.0-4.0,  $p<0.001$ ); metronidazole 5%(95%CI:3.0-7.0, $p<0.001$ );clindamycin 61%(95%CI:52.0-69.0,  $p<0.001$ ); moxifloxacin 42%(95%CI: 29- 54,  $p<0.001$ ); tetracycline 35%(95%CI: 22- 49,  $p<0.001$ ); erythromycin 61%(95% CI: 48- 75,  $p<0.001$ ) and ciprofloxacin 64%(95%CI: 48- 80;  $p<0.001$ ) using the random effect model.

**Conclusions:** A higher weighted pooled prevalence of *C. difficile* was observed. It needs a great deal of attention to decrease the prevailing prevalence. The resistance of *C. difficile* to metronidazole and vancomycin was low compared to other drugs used to treat *C. difficile* infection. Periodic antimicrobial resistance monitoring is vital for appropriate therapy of *C. difficile* infection.

**Keywords:** *Clostridium difficile* infection, Prevalence, Antimicrobial resistance

**Connotation of White Blood Cells and Co-Morbidity with COVID-19 Severity: A Systematic Review and Meta-Analysis.** *Yohannes Zenebe Chekol, Abaineh Munshea, Fentie Ambaw, Gizachew Yismaw, Endalamaw Tesfa, Zewdie Mekonnen, Yesuf Adem, Mulatu Melesse, Begna Tulu, Daniel Mekonnen*

**Background:** The novel coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 ravaged humanity around the world. Several lines of evidences support the association of COVID-19 severity with host and environmental factors. Deciphering the links between COVID-19 severity with host white blood cell count, comorbidity and environmental factors is decisive step towards COVID-19 management.

**Methods:** The review retrieved articles from electronic databases of PubMed, Scopus, medRxiv and bioRxiv. Manual hand search was done at Google scholar for additional articles. Article published in English language up to 09 September 2020 was included. Articles having information on the severity of COVID-19 patients and associated factors were included. All articles screened using PRISMA flow diagram, and the analysis was performed by using Stata 14 and SPSS 21 softwares. The data were pooled into a meta- analysis to gauge the mean difference of parameters.

**Results:** Thirty six articles were included in the review. The average mean age of COVID-19 cases was  $52.46 \pm 7.43$  ( $60.71 \pm 6.83$  among severe and  $48.99 \pm 8.52$  non-severe cases). The mean total white blood cell (WBC) and neutrophil counts were higher in severe COVID-19 patients than non-severe. The pooled mean values of lymphocyte, NK cell, CD3+ T cells, CD4+ T cells and CD8+ T cells were reduced among the severe COVID-19 cases than the non-severe cases ( $p < 0.001$ ). Comorbidities demonstrated significant association with COVID-19 severity.

**Conclusion:** The mean cell counts of key immune cells were very low among severe COVID-19 patients compared with the non-severe COVID-19 patients. Hence, immune cell parameters give signal on COVID-19 cases progression/prognosis.

**Key words:** COVID-19, SARS-CoV-2, Laboratory profile, Comorbidities, Severity, Review

## **Recrudescence and Persistent Submicroscopic *P. Falciparum* Parasitemia Following Treatment of Artemether-Lumefantrine in Ethiopian- Sudan border, western Ethiopia.**

*Geletta Tadele Leta<sup>1</sup>, Fatou K. Jaiteh<sup>3</sup>, Mary Oboh<sup>3</sup>, Eniyu Oriero<sup>3</sup>, Sisay Dugassa<sup>2</sup>, Alfred Amambua-Ngwa<sup>3</sup>, Lemu Golassa<sup>2</sup>*

*1: Wollega University, Medical and health Sciences, Medical laboratory science department 2: Aklilu Lemma Institute of Pathobiology, Addis Ababa University, Addis Ababa, Ethiopia 3: Medical research Council Unit the Gambia at, London school of hygiene and Tropical Medicine, Gambia*

**Background:** The emergence of artemisinin-resistant parasites in Africa is catastrophic as most malaria cases and related deaths are reported in the continent. This study is one of the earliest evaluations of artemether-lumefantrine (AL) efficacy in Ethiopia, seventeen years after the introduction of this drug in the study area. This study aimed at assessing PCR- corrected clinical and parasitological responses at 28 days following AL treatment.

**Methods:** Sixty uncomplicated falciparum malaria patients were enrolled, treated with standard doses of AL, and monitored for 28 days with clinical and parasitological assessments from September 15 to December 15, 2020. Molecular analysis was done on dried blood spots collected from each patient from day 0 and on follow-up days 1, 2, 3, 7, 14, 21, and 28. Descriptive statistics and binary logistic regressions were done using SPSS 20.0 statistical software. A p-value of less or equal to 0.05 was considered significant.

**Results:** Sixty patients enrolled in the study, ten were lost to follow-up; and the results were analyzed for 50 patients. All the patients were fever-free on day 3. Parasite positivity rate on day 3 was zero and 60 % using microscopy and PCR, respectively. Low-density parasite persistence on day 3 was more common among patients < 15 years as compared with those ≥ 15 years (AOR= 6.44, P=0.027). Only two patients met the case definition of treatment failure. These patients were classified as a late clinical failure as they showed symptoms of malaria and asexual stages of the parasite were detected by microscopy on day 14 of their follow-up. Hence, the PCR-corrected adequate clinical and parasitological response (ACPR) rate was 96%. In seven patients, low-density parasitemia persist from day 0 to day 28 of the follow-up. Recrudescence and new infection rate after artemether-lumefantrine therapy was 28 % (14/50) and 2% (1/50), respectively. Most of the recrudescence infections were asymptomatic.

**Conclusion:** AL remains efficacious for the treatment of uncomplicated falciparum malaria in the study area. However, the occurrence of high recrudescence rate and persistence of low-density parasites following AL might compromise this treatment and need careful monitoring.

**Keywords:** Therapeutic efficacy study/ uncomplicated falciparum malaria/ western Ethiopia

**Anticancer Activities of a Novel and Known Sesquiterpene Lactones Isolated from *Vernonia Leopoldi* (Sch. Bip. ex Walp.) Vatke in Breast Cancer Cell Lines.** *Nigatu Tuasha, Zilma Escobar, Daniel Seifu, Endalamaw Gadisa, Beyene Petros, Olov Sterner, Stina Oredsson*

*Vernonia leopoldi* (Sch. Bip. ex Walp.) Vatke (Asteraceae) is one of the widely used anti-cancer traditional medicinal plants in Ethiopia, despite the lack of data to support its therapeutic efficacy. Here we describe the isolation of compounds from the plant and the investigation of their cytotoxicity and other bioactivities. We identified the novel sesquiterpene lactone (SL) 11 $\beta$ ,13-dihydrovernodalol along with the three other SLs (vernomenin, vernolepin, and 11 $\beta$ ,13-dihydrovernodalin) and three flavonoids (apigenin, eriodictiol, and luteolin) isolated from this plant for the first time. The structures of all the compounds were established based on extensive analysis of nuclear magnetic resonance spectroscopic data and confirmed by high-resolution electrospray ionization mass spectrometry. All the SLs were cytotoxic at low mM ranges against MCF-7 and JIMT-1 breast cancer cells as well as against the normal-like MCF-10A breast epithelial cells evaluated in a spectrophotometric assay. All the SLs significantly reduced JIMT-1 cell migration after 72 hours of treatment with 2 mM concentrations in a wound healing assay. Treatment with all SLs reduced the aldehyde dehydrogenase expressing cancer stem cell subpopulation of the JIMT-1 cells significantly, evaluated by flow cytometry. Only 11 $\beta$ ,13-dihydrovernodalin resulted in a significant inhibition of tumor necrosis factor- $\alpha$ -induced translocation of nuclear factor  $\kappa$ B to the cell nucleus. The overall bioactivities of the SL compounds and specifically their effects against the stemness of breast cancer cells make them prime candidates for further in-depth investigation.

**Key words:** Anti-cancer activity, cancer stem cells, traditional medicine

### **Drinking Water Source, Chlorinated Water, and Colorectal Cancer: A Matched Case-Control Study in Ethiopia.** *Nebiyou Tafesse*

**Background:** There is no study conducted on the association between disinfection byproducts (DBPs) in chlorinated drinking water and colorectal cancer (CRC) in Ethiopia. Therefore, this study aimed to determine the relation between chlorine based DBPs in drinking water and CRC in Addis Ababa, Ethiopia.

**Methods:** A facility based matched case control study was conducted involving 224 cases and 448 population controls from June 2020 to May 2021. Cases were defined as histologically confirmed CRC cases. Cases were matched with controls by residence, age, and sex using frequency and individual matching. Geocoding of cases, health facility, and georeferencing of controls were carried out. Data was collected using a pretested structured questionnaire. Pearson Chi square and Fisher's exact tests were employed to assess associations. Stratified analysis was used to detect confounding factors and effect modification. A multivariable conditional logistic regression was used to identify risk factors of CRC.

**Results:** Of 214 CRC cases, 148 (69.2%) used chlorinated water whereas out of 428 controls 161 (37.6%) used chlorinated water. In the final regression model, drinking chlorinated surface water (adjusted matched odds ratio [adjusted mOR] = 2.6; 95% CI 1.7-4.0), history of swimming (adjusted mOR = 2.4; 95% CI 1.4-4.1), years at the place of current residence (adjusted mOR = 1.5; 95% CI 1.1-2.2), hot tap water use for showering (adjusted mOR; 3.8 = 95% CI 2.5-5.9) were significantly associated with CRC. The stratified analysis confirmed that smoking and meat ingestion were not effect modifiers and confounders.

**Conclusion:** Drinking chlorinated water for extended years is a significant risk factor for CRC in Addis Ababa, Ethiopia. In addition, hot tap water use for showering, and swimming history are risk factors for CRC. This information is essential to design integrated interventions that consider chlorination by-products and exposure routes toward the prevention and control of CRC in Ethiopia. Initiating alternative methods to chlorine disinfection of drinking water is also essential.

**Keywords:** Chlorination, colorectal cancer, disinfection byproduct, drinking water, matched case-control, Ethiopia

**Households' Safe Sanitation Access and Its Determinant Factors in Jimma Town, Ethiopia.**

*Dereje Oljira Donacho*

Safe sanitation service is vital to a healthy life and promoting well-being. However, information on the proportion of households' access to safely managed sanitation services and its determinants in urban resource-limited settings is particularly scarce in Ethiopia. This study aimed to determine households' access to a safely managed sanitation service and its associated factors in Jimma, Ethiopia. A cross-sectional study design was conducted on 782 households selected randomly. Household heads were interviewed using a structured questionnaire, and facility conditions were assessed using an observation checklist. A binary logistic regression analysis was employed to determine the association between the explanatory and dependent variables. The study found that a significant proportion of households (87%) use unsafe sanitation services. The presence of a school-attending family member, a smaller family size, heads of households engaged in private work, wives engaged in employed work, a higher monthly income, and toilet age are all associated with access to safely managed sanitation. To ensure safe sanitation access in the setting, sanitation interventions should: take into account household differences; prioritize sustainable sanitation technology options in newly built toilets; improve households' economic status; and expand job opportunities and education for mothers, which demands long-term policy interventions.

**Keywords:** *Determinant factors; Jimma town; safely managed; sanitation; Urban Ethiopia.*

## Traditional Medicine

Abs 50

### **Clinical Outcomes And Predictors of Patients with Fracture In Debre Markos Comprehensive Specialized Hospital, North West Ethiopia, a Prospective Cohort Study.**

*Belayneh Mengist Miteku*

**Background:** Fracture continues to be a major public health concern in many parts of the developing world that results in several consequences and complications including lifelong morbidity and mortality. This study aimed to assess the clinical outcomes of patients following fracture in Debre Markos comprehensive specialized hospital, North West Ethiopia.

**Methods:** An institution-based prospective cohort study was conducted from November 2020 to July 2021 among 207 fracture patients (69 visited traditional bone setter and 138 did not visit traditional bone setter). Data were collected through face-to-face interviews, physical examinations and radiological investigations. Data were entered using Epi-Data version 3.1 and analysis was done using STATA 14 statistical software. Descriptive statistics were summarized using mean, median, standard deviation, and percentage and presented in tables and figures. The generalized linear model was fitted to identify risks of the outcome variables.

**Result:** The mean age of the participants was  $37.5 \pm 13.6$  years and two-third of the participants were males. Nearly half of the patients 92 (44%); 50 (54%) from exposed and 42 (46%) from the non-exposed group were delayed to get treatment from the hospital. The majority of the patients had been treated with Plaster of Paris immobilization (55%) followed by fixation (15%) and a combination of both (12%). Nearly half of the participants (48%); 74% from exposed and 35% from the non-exposed group developed complications during the follow-up period. The commonest complication was joint stiffness (45%) followed by osteoarthritis (21%). The risk of fracture-related complications among patients who did not visit TBS was decreased by 54% as compared to visitors (RR 0.46, 95% CI: (0.35, 0.60)

**Conclusion:** The magnitude of complications following the fracture is found to be high and the risk of complication among patients who visited traditional bone setters increased significantly. Therefore, prevention measures should be strengthened and integration between hospitals and traditional bone setters should be made so that basic training on fractures management will be given.

**Keywords:** Clinical outcomes, fracture, traditional bone setters, Ethiopia



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