International CPHIA 2022
Conference on Public Health in Africa

# ABSTRACT REPORT

# 2nd International Conference on Public Health in Africa

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Kigali, Rwanda

African Union

AFRICA CDC
Centres for Disease Control and Prevention
Safeguarding Africa's Health

Hosted by:

Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

# FOREWORD

In December 2022, we marked a historic moment for the African continent: the first in-person gathering of the international Conference on Public Health in Africa (CPHIA 2022).

2,800 scientists, policymakers, and advocates from around the world gathered in person in Kigali to spotlight African science and innovation, and strengthen local, regional and global collaboration, with an additional 11,625 participants joining the main conference online. The energy and passion for transforming public health was reflected in dozens of sessions, over 175 poster presentations, 56 accepted oral presentations and 59 side events (56 onsite, 3 virtual) across four days - and it's never been clearer that we are facing a major inflection point for health.

As highlighted in the conference discussions, the future of health in Africa will be a story of hope and obstacles. The continent has come a long way toward realising the African Union's New Public Health Order since 2020 but disease outbreaks are on the rise; climate change, food insecurity, population growth and political instability bring new health risks; and too many lives are still being lost to preventable diseases.

While CPHIA 2021 was focused on lessons learned from the pandemic, CPHIA 2022 built upon those discussions to more concretely identify what we need to secure a healthier future for the continent. The second edition of the conference was an opportunity to check on progress since 2021, including in the areas of vaccine manufacturing capacity, innovative financing solutions like public-private partnerships and digital technologies for health.

CPHIA 2022 also went beyond COVID-19, offering dedicated tracks focused on addressing the unfinished agenda of HIV, tuberculosis, malaria, neglected tropical diseases and other infectious diseases, as well as non-communicable diseases and accidents. It also elevated issues of equity and inclusion, dedicating whole tracks to women in health and expanding Universal Health Coverage (UHC) in Africa.

One key takeaway from CPHIA 2022 is that in order to drive sustainable progress, Africa must own the tools of response. With innovation, respectful partnerships, local ownership and investment, we can take advantage of this critical opportunity to accelerate African-led research into scalable solutions for the continent.

Convenings hosted on the continent, such as CPHIA, are part of the solution. We are grateful to the African Union and Africa Centres for Disease Control and Prevention (Africa CDC) for their leadership in improving public health in Africa, including by spearheading this conference. We also thank the Rwanda Ministry of Health and Rwanda Biomedical Centre for serving as the CPHIA 2022 hosts, and the members of the Scientific Programme Committee and the Secretariat for their constant support and contributions in planning this conference.

**We are thrilled that Zambia will serve as the host for CPHIA 2023 so we can keep building on this extraordinary movement. We hope to see you there!**

**Professor Senait Fisseha, MD, JD**
Co-Chair CPHIA 2022

**Professor Agnes Binagwaho, MD, M(Ped), PhD**
Co-Chair CPHIA 2022

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# ABSTRACTS

The second international Conference on Public Health in Africa (CPHIA 2022) supported an open call for abstracts on a wide range of pressing topics impacting health on the continent.

Abstracts were accepted for all 9 conference tracks for CPHIA 2022. We received 1402 submissions, and all submitted abstracts underwent a blind review process by at least three members of the CPHIA Scientific Programme Committee. Of the submissions, 175 were selected for CPHIA's poster hall, and a further 56 were selected for oral presentations. There were 9 parallel sessions organized for oral abstract presentations, and all presenters were allocated 10-minutes to share their findings.

This abstract book provides all accepted abstracts for CPHIA 2022, arranged by conference track.

We thank all of our emerging and seasoned scientists and public health professionals for submitting their work, allowing us to collaboratively learn from each other, and contribute to the growing body of scientific knowledge being generated on the African continent.

We are also grateful to our collaborative partners - the Bill and Melinda Gates Foundation, UNIECF, GIZ and VillageReach - who supported the attendance of successful applicants through the CPHIA 2022 Scholarship Programme.

## Abstract Awards

The Abstract Award recognises scientific excellence, with a merit-based selection of the winner adjudicated by a panel of judges from the Scientific Programme Committee.

The conference's Best Oral Abstract Presentation award went to Ms. Gorreti Marie Zalwango of Uganda for her presentation titled *"Risk factors for death among children with severe malaria in Namutumba District, Eastern Uganda, September 2021 - February 2022."* Ms. Gorreti is a fellow with the Uganda Public Health Fellowship Program.

The conference's Best Abstract Poster Presentation award went to Dr. Mutia Kehwalla Aza of Cameroon for her abstract titled *"Persistence of Plasmodium falciparum DNA in Saliva Stored at Room Temperature for One Year."* Dr. Mutia currently practices in the HIV treatment center at Mfou District Hospital in Cameroon.

*Dr. Ahmed Ogwell, Acting Director of Africa CDC, presenting the Best Oral Abstract Award to Ms. Gorreti Marie Zalwango and the Best Poster Abstract Award to Dr. Mutia Kehwalla Aza.*

## Best Oral Abstract Presentation

### Risk factors for death among children with severe malaria in Namutumba District, Eastern Uganda, September 2021 - February 2022

Gorreti Zalwango[1], Brenda Simbwa[1], Zainah Kabami[1], Peter Kawungezi[1], Richard Migisha[2,1], Benon Kwesiga[2,1], Daniel Kadobera[2,1], Alex Ario[2,1], Julie Harris[3]

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**Conference Track**

Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Severe malaria, Anaemia, Death

**Introduction**
On February 17, 2022, Uganda Ministry of Health received a report from Namutumba District of a "strange disease" causing multiple deaths in children since late 2021. The disease was subsequently confirmed as severe malaria. We investigated risk factors for deaths among children ≤12 years with severe malaria in Ivukula Subcounty, Namutumba District, to inform programming for the prevention of malaria-associated deaths among children in Uganda.

**Methods**
We conducted an unmatched case-control study in Ivukula Subcounty in March 2022. We defined a case as death with history of fever plus convulsions, difficulty breathing, yellow eyes or palms, tea-colored urine, anemia, loss of consciousness, or reduced urine output in a child ≤12 years from September 2021 to February 2022. Controls were severe malaria survivors ≤12 years in the same time period. Cases and controls were identified by Village Health Teams in a ratio of 1:2. Using a semi-structured questionnaire, we obtained demographic, clinical, and risk factor information from cases and control caretakers. We interviewed healthcare workers about drug stocks and other barriers to caring for severe malaria patients. We analyzed using multivariate logistic regression and thematic analysis.

**Results**
Among 46 cases, 63% were <5 years and 23 (50%) were female. Death was associated with anemia (aOR=4.4, 95%CI: 1.5–13), treatment non-completion (aOR=4.0, 95%CI: 1.6–10), and caretakers' education below secondary level (aOR=3.0, 95%CI:1.2–7.3). Healthcare workers reported lack of transport after referral, stockouts of antimalarial drugs and blood products, and absence of integrated community case management of childhood illness (iCCM) programs as challenges in managing children with severe malaria.

**Conclusions**
Specific modifiable factors, including not completing malaria treatment and stockouts of antimalarials and blood, contributed to malaria mortality among children ≤12 years in Ivukula Subcounty. We recommended proper health facility quantification of antimalarial drugs, improved blood product supply, referral support, and activation of iCCM.

## Best Poster Abstract Presentation

### Persistence of *Plasmodium falciparum* DNA in Saliva Stored at Room Temperature for One Year

MUTIA AZA[1,2], ESEMU LIVO[2], Ekali Gabriel[2], Jude Bigoga[2], Rose Leke[2]

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Saliva, Pf DNA, Persistence, Room temperature

**Introduction**
Malaria, a serious disease of human population, kills millions of people every year. Blood collection is inconvenient for repeated sampling in follow-up studies, since it is quite an invasive procedure with an associated infection risk. Maintaining cold chain in sample transportation is a great challenge when long distances are covered. This could result in loss of sample integrity and misdiagnosis if the causative agent found in the sample exists in sub-microscopic amounts and degrades fast. Saliva is a promising less-invasive medium for malaria diagnosis though little is known about its storage at room temperature for long periods. We thus carried out a study to evaluate the persistence of *Plasmodium falciparum* DNA in saliva samples stored for one year at room temperature.

**Methods**
221 archival saliva samples collected and stored at room temperature using OMNIgene®•ORAL kit and corresponding archival blood samples were used.

Microscopy was used for confirmation and quantification of parasitaemia. Molecular identification of Pf in blood and saliva was performed using nPCR. Pf DNA in saliva one year before and after storage was quantified using the QuantStudio™ qRT-PCR device. qPCR data was normalized and analysed using QuantStudio™ Design and Analysis software. Data was analysed using Graph Pad Prism 5.0.3; p-values below 0.05 were considered significant. The study was approved by the Cameroon National Ethics Committee for Research on Humans.

**Results**
79.63% of the positive samples remained positive after one year. 20.3% of the positive samples became negative after one year. There was a 7.45% degradation. There was no cut-off range below which nPCR conducted on the stored samples correctly identified all malaria positive samples detected by microscopy and no correlation between parasite loads and DNA concentrations both one year before and after.

**Conclusions**
Pf DNA persists in saliva samples stored at room temperature over long periods though minimal degradation occurs.

## Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

## Oral Presentation

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### Implementation of the World Health Organization Global Antimicrobial Resistance Surveillance System in Uganda, 2015-2020: Mixed-Methods Study Using National Surveillance Data

Francis Kakooza[1,2], Jonathan Mayito[2], Ibrahim Mugerwa[3], Musa Sekamatte[3], Henry Kajumbula[4]

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Antimicrobial Resistance; Surveillance; Microbiology; Laboratory; Implementation

**Introduction**
Antimicrobial resistance (AMR) is an emerging public health crisis in Uganda. We describe the establishment of the national AMR program in Uganda and present early microbial susceptibility results.

**Methods**
A systematic description of the process made in establishing the national AMR program was done from ten sites in Uganda from 2015 to 2020. This was followed by reporting the findings with 19,216 participants with 1429 bacterial isolates recovered . Binomial confidence intervals (95%) for the proportions of recovery and resistance were calculated using the Wilson method.

**Results**
The highest proportion of the specimens was blood (n=12,398, 64.5%) followed by urine (n=5,278, 27.5%), and then by stool (n=1,266, 6.6%), while, the least proportion were uro-genital swabs (n=274, 1.4%). High resistance of E. coli was noted with 52.7%, 95% CI (46.8-58.5) resistance to ceftriaxone, imipenem 18.8%, CI (14.9-23.4) and ciprofloxacin 52%, CI (47.5-56.6). High resistance of N. gonorrhoeae with 10%, 95% CI (1.8-40.4) resistance to ceftriaxone and

ciprofloxacin 71.4, 95% CI (45.4-88.3). High resistance of Salmonella and Shigella and K. pneumoniae was noted among commonly used antibiotics, including resistance to meropenem, ceftriaxone and ciprofloxacin.

Among Gram-positive bacteria, high resistance of S. aureus was noted with 42.9%, 95% CI (28-59.1) resistance to cefoxitin, oxacillin 30.9%, 95% CI (21.2-42.6), TMP/SMX 76.9%, 95% CI (69.0-83.2), vancomycin 15.5%, 95% (9.6-24.0) (table 4). High resistance of Enterococcus sp. was noted with 81.8%, 95% CI (61.5-92.7) resistance to ciprofloxacin and vancomycin 50%, 95%CI (33.6-66.4).

**Conclusions**
Uganda is the first African country to implement a structured national AMR surveillance program in alignment with the WHO GLASS. The reported AST data indicates high resistance to the commonly recommended and prescribed antibiotics. The current AMR data will inform the development of treatment algorithms and clinical guidelines

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## PREVALENCE AND RISK FACTORS FOR HEPATITIS B INFECTION AMONG PREGNANT WOMEN ATTENDING ANTENATAL CLINICS IN MOGADISHU, SOMALIA

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
HBV, associated factors, pregnancy, Mogadishu.

**Introduction**
Hepatitis is a common term for liver inflammation caused on by a number of viruses, including Hepatitis A, B, C, D, and E. Hepatitis B virus infected more than 2 billion people alive today with 350 million infected chronically and being carriers of the virus. this study was carried out to determine the prevalence and risk factors of hepatitis B infection among pregnant women attending ANC clinics in Mogadishu, Somalia.

**Methods**
The study was a cross sectional, the study subjects were selected by systematic random sampling and every fifth outpatient was included in the study and blood sample was taken for routine investigation. Blood samples were subjected to Hepatitis B screening by ELISA method after getting consent from the study subjects

**Results**
Of the 384 pregnant women included in the study, 54 (14.1%) were sero-positive for Hepatitis B surface antigen. The significant risk factor for hepatitis positivity were female genital mutilation (COR-3.125; CI-95%1.089-8.96; p=0.0262), blood transfusion history (COR-3.54, CI-95%-1.01-7.79p=0.000135)and dental procedure history (COR-1.986; 95%CI- 1.11-3.54; p-0.0187). There was no significance difference with respect to positive history of jaundice (p= 0.432), and history of surgical procedure (p= 0.538).

**Conclusions**
The prevalence of hepatitis B was higher compared to the previous studies. Blood transfusion, history dental procedure and female genital mutilation were found to be associated with hepatitis B infection. Therefore creation of health awareness one mode of transmission is important.

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## Réponses anticorps à la protéine Spike du SRAS-CoV-2 chez des individus sains après vaccination à Brazzaville, République du Congo

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Vaccin, Sinopharm BBIP-CorV, Janssen/Ad26.COV2.S, SARS-CoV-2, anticorps, République du Congo

**Introduction**
Although assessing immune responses after vaccination is part of the evaluation package of vaccine effectiveness in real-world, limited data have been reported from Africa including the Central Africa. This study aimed to assess the anti-SARS-CoV-2 antibody responses after vaccination in Brazzaville, in the Republic of Congo

**Methods**
This was a cross sectional study conducted from February 2021 to September 2022 with blood samples collected in individuals recruited in the different health Districts of Brazzaville in the Republic of Congo. Of the 323 individuals enrolled, 246 (76.2%) were fully vaccinated with Sinopharm/BBIP-CorV or Janssen/Ad26.COV2.S or Sputnik. The determination of plasma specific antibodies to Spike protein of SARS-CoV-2 was performed by the ELISA technique.

**Results**
Significant higher levels of anti-SARS-CoV-2 IgG (p=0.014) and antibody neutralizing capacity (p = 0.0001) were found in fully vaccinated participants compared to unvaccinated participants. The similar results were observed with the prevalence of IgG and neutralizing antibodies. While IgG levels in the vaccinated participants were higher in Janssen/Ad26.COV2.S and Sinopharm groups compared to spunik group (p=0.0002), the antibody neutralizing capacity was higher in the Janssen/Ad26.COV2.S and sputnik groups compared to Sinopharm BBIP-CorV group (p=0.02) during the first three months of post vaccination period. The antibody neutralizing capacity was negatively correlated with age (r= - 0.22; p=0.016 in Sinopharm/BBIP-CorV group, r =- 0.38; p=0,010 in Janssen/Ad26.COV2.S group, and r = - 0.28 ; p = 0.03 in the Sputnik group).

**Conclusions**
The results from this study together indicate that the vaccines used in the Republic of Congo induce the expression of specific IgG and neutralizing anti-SARS-CoV-2 antibodies in the population. It will be necessary to study this post-vaccination anti-SARS-CoV-2 antibody response in Congolese with other pathologies, especially HIV/AIDS.

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## Association between TNF-α Levels and TNF-α 238 Alleles Polymorphism and Falciparum Malaria Anemia among Sudanese Children

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Falciparum malaria anemia, TNF-α levels, TNF-α 238 alleles, RBCs parameters, Sudanese children

**Introduction**
TNF-α level is a central proinflammatory cytokine, their production is associated with complications of falciparum malaria especially malaria anemia. The study aimed to evaluate the association between TNF-α levels, TNF-α 238 alleles polymorphism and falciparum malaria anemia.

**Methods**
A case control study was conducted among 300 children [100 severe malaria (average 8.63 ± 3.40 years; 61% male), 100 uncomplicated malaria (average 8.83 ± 4.20 years; 45% male) and 100 normal healthy controls (average 10.08 ± 3.58

years; 50% male)]. RBCs parameters were determined using the Sysmex XP 300 N hematology analyzer. TNF-α level was measured using Human TNF-α ELISA MAX™ Deluxe Sets. PCR and gel running system were used for detecting TNF-α 238 Alleles polymorphism. Obtained data were analyzed by SPSS (V 16.0).

**Results**

Falciparum malaria anemia was accounted for 32%, commonly in SM (55%) compared to UM (9%) (P-value 0.000). Otherwise, The average of TNF-α levels in mild, moderate, and severe anemia were (190.75 ± 102.55, 189.70 ± 80.35, and 299.75 ± 82.27 pg/ml respectively) giving highly significant differences between them (P value 0.000) and strong significant positive correlation (r + 0.309; P-value 0.000). TNF-α 238 GA, AA, and GG account for (58, 36, and 6% respectively) in UM; while (51, 43, and 6% respectively) in SM. The TNF-α 238 A allele account for 83.6% of malaria anemia (P-value 0.000) and 100% severe anemia (P-value 0.000); TNF-α 238 A allele to be associated with susceptibility to 3.13 fold risk for developing anemia.

**Conclusions**

Overproduction of TNF-α in children with TNF-α 238 A Allele may result in falciparum malaria anemia among children. The results obtained in this study will help clinicians to improve the management of severe malaria cases.

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## Evaluation of Sub-microscopic Residual Parasitaemia on Day-3 and 14 after Artemether–Lumefantrine or Pyronaridine–Artesunate Treatment of Uncomplicated Plasmodium falciparum Malaria among children in Ibadan, Southwestern Nigeria

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**Conference Track**

Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**

Sub-microscopy, PCR-determined, Residual Parasitaemia, Plasmodium falciparum Malaria, Nigeria.

**Introduction**

Microscopic evaluation of parasite clearance is the gold standard in antimalarial drug efficacy trials. However, presence of sub-microscopic residual parasitaemia after artemisinin-based combination therapy (ACT) has raised public health concerns to the efficacy of currently used antimalarial drugs. Our study evaluated the prevalence of PCR-determined residual parasitaemia on days 3 and 14 post treatment with artemether-lumefantrine (AL) or pyronaridine-artesunate (PA) in children aged 3 -144 months in Ibadan, Southwestern Nigeria. The research question is "is submicroscopic residual parasiteamia caused by asexually viable parasites, gametocytes or dead parasite DNAs'?

**Methods**

One hundred and twenty (AL: n = 60, PA: n = 60) days 3 and 14 dried blood spots, negative by microscopy were analyzed for residual parasitaemia using nested PCR. Isolates with residual parasitaemia on days 3 & 14 were further genotyped with their corresponding day-0 isolates using merozoite surface proteins msp-1, msp-2 and glurp genes for allelic similarity.

**Results**

Persistent PCR-determined sub-microscopic residual parasitaemia at day 3 post ACT treatment was 83.3% (AL) and 88.3% (PA), respectively (ρ = 0.600), while 63.6% and 36.4% (ρ = 0.066) isolates were parasitaemic at day 14 for AL and PA respectively. Microscopy-confirmed gametocytaemia persisted from days 0 -7 and days 0 -21 for AL and PA. When the alleles of day 3 versus day 0 were compared according to base pairs sizes, 59% parasite shared identical alleles for glurp, 36% each for 3D7 and FC27 while K1 was 77%, RO33 64% and MAD20 23% respectively. Similarly, Day 14 versus day 0 was 36% (glurp), 64% (3D7), 32%

(FC27) while 73% (K1), 77% (RO33) and 41% (MAD20) respectively.

**Conclusions**
The occurrence of residual parasitaemia on days 3 and 14 following AL or PA treatment may be attributable to the presence of either viable asexual, gametocytes or dead parasite DNAs which requires further investigation.

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## Assessing dengue and chikungunya infections among febrile patients visiting four healthcare centres in Yaoundé and Dizangué, Cameroon

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Dengue; chikungunya; Dizangué; Yaoundé; Cameroon.

**Introduction**
Dengue and chikungunya are now widely distributed in Cameroon but there is still not enough information on their prevalence in different epidemiological settings. This study was undertaken to assess dengue and chikungunya prevalence in both urban and rural settings in Cameroon using 3 diagnostic tools.

**Methods**
From December 2019 to September 2021, willing febrile (temperature >38°C) outpatients visiting 4 healthcare facilities in the cities of Yaoundé and Dizangué were screened for malaria, dengue and chikungunya. Patients' clinical symptoms were recorded and their blood samples collected, then analysed using rtRT-PCR, RDTs, ELISA and Giemsa-stained tick blood smear. Odds ratios were used to determine the level of association between socio-demographic factors, clinical features and the infection status. Kappa statistic permitted to assess the level of agreement between RDTs and ELISA.

**Results**
Overall, 301 patients were recruited: 198 in Yaoundé and 103 in Dizangué. The prevalence varied according diagnostic tool. For dengue, 110 patients were positive to rtRT-PCR: 90 (45.45%) in Yaoundé and 20 (19.42%) in Dizangué. The prevalence of dengue IgM using ELISA varied from 22.3% in Dizangué to 30.8% in Yaoundé. Dengue positivity rate using RDTs was 7.6% in Yaoundé and 3.9% in Dizangué. For chikungunya, one (0.5 %) patient (Yaoundé) was tested positive to rtRT-PCR. The prevalence of chikungunya IgM with ELISA varied from 18.4% in Dizangué to 21.7% in Yaoundé, while using RDTs, it was 4.5% in Yaoundé and 12.6% in Dizangué. RDTs for either chikungunya or dengue displayed very poor sensitivity. Abdominal and retro-orbital pains were significantly associated to acute dengue infection. All the four dengue serotypes were recorded with a predominance of DENV-3 (35.45%) and DENV-4 (25.45%).

**Conclusions**
This study further confirms endemicity of both dengue and chikungunya in Yaoundé and Dizangué. These data stress the need for active surveillance of cases to prevent outbreaks occurrence across the country.

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## TITRE: MALADIES EMERGENTES REEL MENACE POUR LA SANTÉ PUBLIQUE: A PROPOS DE L'EPIDEMIE DE CHIKUNGUNYA A L'EST DU TCHAD EN 2020 DANS UN CONTEXT DE PANDEMIE DE LA COVID-19.

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Emergence Chikungunya COVID-19 Tchad

**Introduction**
Durant l' année 2020 le Tchad était doublement frappé par deux épidémie celle de la COVID-19 et pour la première fois une épidémie de Chikungunya. Les rumeurs de l'épidémie était rapporté depuis Janvier 2020 mais à cause de la gestion de la pandémie de COVID-19 cette rumeur était passé inaperçu jusqu'à l'éclosion de l'épidémie en Juillet 2020 dans plusieurs district (Abeche Biltine Goz Beda Abougoudam…) de l'Est du pays.

**Methods**
Une equipe pluridisciplinaire compose d'une infectiologue ,un épidémiologiste, un technicien en Laboratoire et deux entomologistes médicaux ont été pour investigation. Sur le terrain l'equipe a effectue une investigation epidemiologique, clinique et entomologique.

Definition des cas: Fievre, cephalée et polyarthralogie.

Données analysés par STATA 16 version.

**Results**
Au total 38140 cas ont été enregistrés. Les femmes étaient les plus représentés 20432 soit 53,5%. La tranche d'âge de plus de 15 ans était majoritaires avec 78% des cas. Le taux de létalité était très faible 0,03‰. 90% des patients avaient un TDR/Paludisme négative.

Les signes cliniques les plus dominant était fièvre (100% des cas), céphalées (95% des cas) et polyarthralgie invalidante dans 67% des cas. L'éruption cutanées était plus fréquente chez les enfants de moins de 10 ans 57% des cas.

Sur les 301 spécimens d'Aedes collectés tous ont été identifiés comme Aedes Aegypti. Indice « maison » était de 37%. Indice « récipient » est de 46% et l'indice de Breteau était de 71 gîtes positifs pour 100 habitations.

**Conclusions**
Malgré que le Chikungunya a un taux de létalité très faible cette pathologie est très invalidante et pouvant générer des cout indirect non négligeable. La méconnaissance de la maladie, et la pandémie de la COVID-19 ont probablement contribué a un retard sur la gestion et riposte de cette épidémie de Chikungunya a l'EST du Tchad.

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## History and status of human and animal viral research in Rwanda until 2020

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
One Health, policy, research, Rwanda, viral diseases, viruses

**Introduction**
Central East African region, where Rwanda is located, is considered as one of the major global

hotspots of emerging infectious diseases. Several viral pathogens were originally reported in this region. These include human immunodeficiency virus (HIV), Ebola, Zika, Rift Valley Fever, dengue, and many other neglected tropical viral pathogens. In Rwanda, viral diseases are underreported and the question is whether this is due to the absence of these viruses or a lack of investigation.

**Methods**

we have put together a review that describes the status of human and animal virus research in Rwanda from 1958 to 2020 and identifies relevant research and operational gaps. A comprehensive search was conducted in PubMed for virus research in Rwanda: 233 primary studies on viruses/viral diseases are indexed with connection to Rwanda

**Results**

This review highlights four main findings. First, most of the viral research in Rwanda has been focused on HIV, with relatively minor involvement of Rwandan institutions. Second, the totality of the published research regarding viruses and viral diseases of animals and humans in Rwanda mainly provide a basic baseline that lacks in-depth analyses or follow-up. Third, virus research in domestic animals and wildlife is relatively lacking, and the few available reports were mainly part of external funding related to the conservation of non-human primates. Fourth, although viruses with known or suspected zoonotic potential were reported, only two studies were explicitly designed to evaluate the zoonotic nature of the investigated viruses.

**Conclusions**

We recommend investment in human capacity, laboratory facilities and research to inform policy for viral surveillance in Rwanda. The occurrence of the current severe acute respiratory syndrome coronavirus 2 pandemic shows strengthening warning and surveillance systems is critical to efficient preparedness and response.

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## 933

## SARS-CoV-2 Introduction and Lineage Dynamics in Cameroon: Evidence from the Genomic Surveillance Network

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**Conference Track**

Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**

SARS-CoV-2, variants, Cameroon, Genomic surveillance, Whole Genome Sequencing

**Introduction**
During the early phase of the COVID-19 pandemic in Cameroon, a framework for genomic surveillance, a national strategy, and laboratory capacity were developed with PCR point mutation assays, targeted sequencing, and whole-genome sequencing. Our objectives were to set-up a genomic surveillance network and to study the dynamics of SARS-CoV-2 lineages during the four waves of COVID-19 in Cameroon.

**Methods**
A laboratory-based survey was conducted within the national public health emergency operational framework for COVID-19 in Cameroon, from March 1, 2020 to March 30, 2022, through an assessment of the national capacity for SARS-CoV-2 molecular testing, genomic surveillance and the evolutionary patterns of SARS-CoV-2 lineages over time at country-level.

**Results**
Through the developed COVID-19 network, laboratory capacity for COVID-19 molecular testing moved from 1 to 46; capacity for PCR-variant screening moved from 0 to 16; capacity/network for SARS-CoV-2 sequencing moved from 0 to 6; and 3,881 PCR-positive samples were successfully processed for SARS-CoV-2 genomic surveillance. Out of the 3,881 samples successfully processed, 760 were whole-genome sequences; of these 760, 74% were viral sub-lineages of origin, 15% were Delta variants, 6% were Omicron variants, 3% were Alpha variants, and 2% were Beta variants. The epidemic was driven by the SARS-CoV-2 lineage of origin in Wave 1 (16 weeks, 2.3% CFR), the co-introduction of Alpha and Beta variants in Wave 2 (21 weeks, 1.6% CFR), the Delta variant in Wave 3 (11 weeks, 2.0% CFR), and the Omicron variant in Wave 4 (8 weeks, 0.73% CFR), with a declining trend over time (p=0.01208).

**Conclusions**
Following COVID-19 pandemic, laboratory capacity for molecular-testing and genomic surveillance improved in Cameroon. SARS-CoV-2 patterns moved from lineages of origin, Alpha, Beta variants, Delta, to Omicron variants, with declining trends in wave duration, confirmed cases, hospitalisations, and CFR. Leveraging from this network will ease response to future outbreaks.

## 1413

# The effect of weekly text messaging on viral load monitoring before delivery among pregnant HIV positive women: a randomized controlled trial (WelTel PMTCT)

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
HIV, viral load, mother-to-child transmission, PMTCT, mHealth, text-messages

**Introduction**
Regular HIV viral load (VL) monitoring is a critical part of the prevention of mother-to-child transmission of HIV (PMTCT) to achieve viral suppression. We investigated whether weekly interactive mobile phone messages (SMS) improve VL testing and suppression before delivery in a high HIV prevalence area in Western Kenya.

**Methods**
This was a multi-site, open-label, two-arm, randomized parallel-group trial conducted between June 2015 and July 2019. Pregnant HIV-positive women enrolling for antenatal care, ≥18 years with access to a mobile phone were randomly assigned in a 1:1 ratio to receive weekly SMS until 24 months postpartum (N=299), or standard care (N=301). The secondary outcome reported in this analysis was having a VL test done 3 and 6 months before delivery. Viral suppression (<20, <400, and <1000 copies/ml levels) was investigated among women with tests. We estimated adjusted risk ratios (aRR) using Poisson regression stratified by timing of HIV diagnosis.

**Results**
The uptake of VL test 3 months before delivery was 14.7% vs. 13.3% in the intervention and control groups

respectively; (aRR=1.16, 95% CI: 0.79, 1.70; p=0.46), and 22.4% vs. 25.2% at 6 months before delivery; (aRR=0.87, 95% CI: 0.66, 1.15; p=0.33). Of those who had VL test, 86.4% and 87.5% achieved viral suppression within 3 months in the intervention and control group, respectively. Corresponding estimates within 6 months were 88.1% vs. 82.9%. There were no differences in treatment effect between study arms by of timing of HIV diagnosis.

**Conclusions**

We found no evidence supporting that weekly SMS improved VL testing and suppression among HIV-positive pregnant women in this study context. Overall low uptake of VL tests in both trial arms may be a result of high cost and low access to VL tests within the PMTCT services in Kenya.

## 1636

## The added-value of using of Pulse Oxymeter into the Integrated Management of Childhood Illness guidelines to better identify and manage severe cases among children under-5 years old in West Africa, June 2021 to June 2022

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**Conference Track**

Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**

IMCI, Pulse oxymeter, Hypoxemia, Primary Health Centre, severe cases, hospital referral

**Introduction**

The Integrated Management of Childhood Illness (IMCI) guidelines for children under 5 is a symptom-based algorithm guiding health care workers in resource-limited countries at the primary health center (PHC) level. Hypoxemia (SpO2< 90%) is a life-threatening complication underdiagnosed in western Africa. To improve the diagnosis and care-management of hypoxemia, the AIRE project, UNITAID-funded, has implemented the routine Pulse Oxymeter use into IMCI consultations at PHCs in Burkina Faso, Guinea, Mali and Niger. We aimed to measure the added value of PO use.

**Methods**

In 16 AIRE research sites (4/country), all children aged 0-59 months attending IMCI consultations, except those aged 2-59 months classified as green case without cough or breathing difficulties were eligible for PO use, and enrolled in a cross-sectional study with parent's consent. Those classified as severe cases were enrolled in a 14-Day prospective follow-up. Socio-demographic and clinical data including data about PO use, pathways, patterns of care and health outcomes at D14 were collected.

**Results**

From June 2021 to June 2022, 39,525 children attended IMCI consultations of the study PHCs, of whom 30,645 (77.5%) had an SpO2 measurement. Hypoxemia prevalence was 0.7% (95% confidence interval [95%CI]: 0.6-0.8) and 6.6% (95%CI: 5.8– 7.5) among all IMCI children with a SpO2 measurement, and all severe cases identified, respectively. Among the 3,191 severe cases identified, 1.9% (95% CI: 1.5 - 2.5) were detected using PO only; 1,981 severe cases were enrolled and followed-up: their D-14 mortality rate was 4% (95% CI: 3.5 -5.3). No death occurred among severe cases identified by PO only.

**Conclusions**

Based on this large sample study, the uptake of PO integrated into IMCI consultations was high at PHC level and severe cases have been increased for +1.9%. However, hospital referral and timely oxygen therapy to manage them remain challenges for governments in these West African settings.

## 1654

## Impact of the COVID pandemic on adherence to standard precautions in a Tunisian university hospital: evolution between 2020 and 2022

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
COVID-standar precautions- tunisia-evolution

**Introduction**
The unprecedented sanitary crisis of COVID-19 pandemic should have enhanced health care workers awareness about the importance of adherence to barrier measures, notably standard hygiene precautions.

Aim: To compare adherence to standard precautions among a Tunisian teaching hospital health care workers during the first wave of the COVID-19 pandemic in 2020 and the sixth wave in 2022.

**Methods**
This was a practice audit of standard precautions by direct observation at Sahloul University Hospital during the Covid-19 first wave in 2020 and 2022, after several waves. A cross sectional study was carried out during 1 month in "sahloul" a Tunisian university hospital.

**Results**
The compliance with hand hygiene decreased significantly from 57.1% in 2020 to 34.4% in 2022% (p<0.001). Similarly, the adherence to Gloves Wearing decreased from 77.6% to 71.6% (p=0.263). As for other personal protective equipments use, face protection decreased from 23.8 % to 0.7 % and protective clothing decreased from 55.8% to 39,.4%. As for respiratory hygiene, the adherence decreased 69.6% to 61.3% (p=0.331). Concerning blood safety, it decreased significantly (p<0.001) from 79.4% to 65.9%. The highest compliance was in excreta management. Although, it decreased from 87.2% in 2020 to 80.8% in 2022 (p=0.116). And finally adherence to environmental management increased insignificantly from 68.1% in 2020 to 71.5% in 2022 (p=0.304).

**Conclusions**
This study documented a substantial decrease in the adherence to standard precautions relative hand hygiene and personal protective equipments. In the light of these results, we should now take alarm and mobilize to recover this possible loosening in the engagement to patients' security within the recurring covid19 waves.

# Poster

## 67

## Factors associated with sputum smear non-conversion after two months of treatment among smear-positive pulmonary tuberculosis patients in Rwanda, from July 2019 to June 2021

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Pulmonary tuberculosis, smear conversion, factors, Rwanda

**Introduction**
Background and objectives: Non-conversion of sputum smear prolongs the infectivity of patients with pulmonary tuberculosis (PTB) and has been

associated with unfavorable tuberculosis (TB) treatment outcomes. There is a lack of evidence on predictors of sputum smear non-conversion among smear-positive PTB (SPPTB) patients in Rwanda. This study aimed to determine the factors associated with sputum smear non-conversion after two months of treatment among SPPTB patients in Rwanda.

**Methods**
A cross-sectional study was conducted among SPPTB patients registered in the national electronic TB reporting system by all health facilities countrywide (Rwanda) from July 2019 to June 2021, who had completed the first two months of anti-TB treatment and with registered follow-up sputum smear results at the end of the second month of treatment. Bivariate and multivariate logistic regression was computed to determine the factors associated with sputum smear non-conversion. Odds ratio (OR), 95% confidence interval (CI), and p-value <0.05 were reported.

**Results**
This study included a total of 7211 patients. Of these 632 (9%) patients had sputum smear non-conversion at the end of the second month of treatment. Age group of 20-39 years (AOR=1.7, 95% CI: 1.04-2.86) and 40-59 years (AOR:2, 95% CI: 1.18-3.3 ), living in Northern province of Rwanda (AOR=1.4, 95% CI: 1.05-2.0), history of first-line TB treatment failure (AOR=2, 95% CI: 1.1-3.6), follow up by community health workers (AOR=1.2, 95% CI: 1.04-1.5) and BMI <18.5 at TB initiation (AOR=1.5, 95% CI: 1.25-1.8) were associated with sputum smear non-conversion after two months of treatment.

**Conclusions**
This study showed that sputum smear non-conversion among SPPTB patients was low compared to the results of studies conducted in other settings. As sputum conversion is considered by WHO as a useful indicator used in monitoring the performance of TB control programs, rigorous follow-up of patients with identified risk factors for non-conversion is recommended.

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## PREPAREDNESS AND RISK ASSESSMENT FOR PLAGUE IN WEST NILE REGION-UGANDA, AUGUST 2021

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Plague, Cross border, preparedness and readiness, Uganda

**Introduction**
Ituri Province in Democratic Republic of Congo (DRC) is a hotspot for plague, with occasional crossing of case-patients into Uganda. As of June 2021, 117 cases were reported in Ituri Province, DRC. In August 2021, we evaluated the risk of plague importation into West Nile region of Uganda and assessed the level of preparedness to respond.

**Methods**
We used the Population Connectivity Across Borders toolkit to assess risk of plague introduction in 6 West Nile districts and one city. We categorized risk in districts based on previous cases, volume of cross-border movements, and proximity to the outbreak epicenter in DRC. We assessed districts' preparedness to respond using an adapted WHO checklist and Readyscore criteria (scores <40%= 'not prepared'). We assessed 47 health facilities across six West Nile districts for response readiness in terms of healthcare worker training, availability of standard operating procedures, and training of village health teams.

**Results**
Two districts (Arua and Zombo) in West Nile were in the highest-risk category for plague importation. All districts scored as 'not prepared', although Zombo and Arua scored higher (both 39%) than other districts. Of 47 health facilities assessed, 21 were 'not

ready', and no facility was 'prepared'. Only 10 had staff who had been trained in plague-related activities.

**Conclusions**
No districts or health facilities in the area assessed were prepared to respond to potential plague importation. The risk of importation is high, especially in Arua and Zombo Districts. Arua and Zombo Districts should be prioritized for preparedness activities for a potential plague outbreak.

## 204

## Community-based sero-prevalence of chikungunya and yellow fever in the South Omo Valley of Southern Ethiopia

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Chikungunya, yellow fever, sero-epidemiology, community-based, Ethiopia

**Introduction**
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**
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**
Results: A total of 360 participants (51.7% males, age range from 6 to 80, mean age ± SD = 31.95 ± 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.

**Conclusions**
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.

## 295

## High SARS-CoV-2 seroprevalence among street adolescents in Lomé, Togo, 2021

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
SARS-CoV-2 seroprevalence, Street adolescents, West Africa, Togo

**Introduction**
There is almost no data on the circulation of SARS-CoV-2 among street adolescents. We conducted a study to document the immunization status of street adolescents in Togo against different variants of SARS-CoV-2.

**Methods**
A cross-sectional study was carried out in 2021 in Lomé, the city with the highest COVID-19 cases in Togo (60%). Adolescents aged 13- and 19 years old living on the street were eligible for inclusion. A standardized questionnaire was administered face-to-face to adolescents. A blood sample was taken and aliquots of plasma were transported to the virology laboratory of the Hôpital Bichat-Claude Bernard (Paris, France). SARS-CoV-2 anti-S and anti-N IgG were measured using chemiluminescent microparticle immunoassay. A quantitative miniaturized and parallel-arranged ELISA assay was used to detect IgG antibodies directed against the different SARS-CoV-2 Variants of Concern (VOC).

**Results**
A total of 299 street adolescents (5.2% female), median age 15 years, interquartile range [14-17], were included in this study. The prevalence of SARS-CoV-2 infection was 63.5% (95%CI: 57.8-69.0). Specific IgG against the ancestral Wuhan strain was developed by 92.0% of subjects. The proportion of patients being immunized against each VOC was 86.8%, 51.1%, 56.3%, 60.0, and 30.5% for the Alpha, Beta, Gamma, Delta, and Omicron VOCs, respectively.

**Conclusions**
This study showed a very high prevalence with approximately 2/3 of Togolese street adolescents having antibodies to SARS-CoV-2 due to a previous infection. These results confirm an under-reporting of COVID-19 cases in Togo, questioning the hypothesis of low virus circulation in Togo and even in Africa.

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## Molecular identification of Trypanosoma brucei gambiense in naturally infected pigs, dogs and small ruminants confirms domestic animals as potential reservoirs for sleeping sickness in Chad

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Key words : Animal reservoir, Trypanosoma brucei gambiense, Sleeping sickness, Domestic animals.

**Introduction**
Background : Human African trypanosomiasis (HAT) has been targeted for zero transmission to humans by 2030. Animal reservoirs of gambiense-HAT could jeopardize these elimination goals. This study was undertaken to identify potential host reservoirs for Trypanosoma brucei gambiense by detecting its natural infections in domestic animals of Chad Human African trypanosomiasis (HAT) foci.

**Methods**
Methods : Blood samples were collected from 267 goats, 181 sheep, 154 dogs, and 67 pigs. Rapid diagnostic test (RDT) and capillary tube centrifugation (CTC) were performed to search for trypanosomes. DNA was extracted from the buffy coat, and trypanosomes of the subgenus Trypanozoon as well as Trypanosoma brucei gambiense were identified by Polymerase Chain Reaction (PCR).

**Results**
Results : Of 669 blood samples, 19.4% were positive by rapid diagnostic test (RDT) and 9.0% by capillary tube centrifugation (CTC). Polymerase Chain Reaction (PCR) revealed 150 animals (22.4%) with trypanosomes belonging to Trypanozoon, including 18 (12%) Trypanosoma brucei gambiense. This trypanosome was found in all investigated animal species and all Human African trypanosomiasis (HAT) foci. Between animal species or villages, no significant differences were observed in the number of animals harboring Trypanosoma brucei gambiense DNA. Pigs, dogs, sheep and goats appeared to be potential reservoir hosts for Trypanosoma brucei gambiense in Chad.

**Conclusions**
Conclusion : The identification of Trypanosoma brucei gambiense in all animal species of all Human African trypanosomiasis (HAT) foci suggests that these animals should be considered when designing new control strategies for sustainable elimination of Human African trypanosomiasis (HAT). Investigations aiming to decrypt their specific role in each epidemiological setting are important to achieve zero transmission of Human African trypanosomiasis (HAT).

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## COMPARISON OF SEROLOGICAL AND MOLECULAR TREPONEMA PALLIDUM TESTS IN HIV PATIENTS IN KENYA, APRIL 2020.

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Syphilis, Serology, PCR, Test performance, HIV, Kenya

**Introduction**
Background: Co-infection of HIV and Syphilis has profound impact in a patient. Syphilis infection is caused by Treponema pallidum. Two category of test methods are used; Nontreponemal test, e.g. RPR (rapid plasma regain) and Treponemal test such as TPHA (Treponema Pallidum Hemagglutination Assay). The current gold standard in Kenya/Nyeri is TPHA. Polymerase chain reaction (PCR) has higher sensitivity and specificity than serological assays.

Objective: To evaluate the test performance of serological methods (VDRL, RPR and TPHA) in syphilis testing using PCR as the gold standard among HIV patients visiting Nyeri County Referral Hospital

**Methods**
Design: Cross-sectional study

Setting: Patients routinely attending the CCC clinic for antiretroviral treatment.

Sample size and Sampling Method: 177 HIV patients receiving ARVs . A list of all patients meeting the recruitment criteria generated . Consecutive

sampling technique was used to consent and recruit every subject meeting the criteria of inclusion till the required sample size was achieved.

Data management and analysis: All patient information and biological samples given unique number for identification. Inputting of data into the electronic databases done using unique number in files with safe password. Descriptive statistics used.

**Results**
The mean age of the study patients was 48.3 years with the majority 60.5% being female. The prevalence of syphilis was 18.6% by PCR. The sensitivity, specificity and kappa of tests were: RPR: 100%, 76.4% and kappa (0.546); VDRL: 100%, 55.6% and kappa (0.317); TPHA: 100%, 94.4% and kappa (0.864) and combination of RPR/VDRL and TPHA: 100%, 54.2%, and kappa (0.306).

**Conclusions**
Syphilis positivity rate was found to be high (18.6% ) showing the need to upscale screening for early treatment . The results show that neither RPR nor VDRL assay could be recommended as a stand-alone or as a confirmatory assay. The results of TPHA were the most concordant with those of PCR.

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## Dengue, a growing public health issue in Douala, Cameroon

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Dengue, acute febrile illnesses, Aedes mosquitoes, Central Africa

**Introduction**
Dengue is the most prevalent mosquito-borne arboviral disease worldwide, although neglected in Africa. We investigated the contribution of dengue infections to the burden of acute febrile illness recorded in Douala, Cameroon and we identified potential vectors of the virus in selected neighborhoods.

**Methods**
Between July to December 2020, febrile volunteers were recruited in four hospitals in Douala. Dengue infections were detected by real-time RT-PCR targetting the 5' and 3' UTR while. the envelope gene was submitted to phylogeny. Subsequently, a household investigation was conducted to assess dengue seroprevalence among asymptomatic population and identify potential Aedes vectors.

**Results**
Overall, 13% (48/369) acute febrile patients included in Douala were positive to dengue virus. Dengue virus 3 (DENV-3) was the most common serotype (68.3%), followed by DENV-2 (19.5%) and DENV-1 (4.9%). DENV-3 and DENV-2 co-infections were found in three cases. This is the first description of the simultaneous occurrence of three dengue serotypes in Cameroon. Phylogenetic analysis of the envelope gene identified DENV-1 as belonging to genotype V, DENV-2 to genotype II and DENV-3 to genotype III. Then, 224 asymptomatic participants were recruited in 76 houses in neighborhoods with confirmed dengue cases. The seroprevalence was high with 54.02 % (121/224) IgG and 12.5% (28/224) IgM with 96.42% (27/28) IgM positive volunteers carrying IgG antibodies. NS1 antigen was not detected in asymptomatic participants but NS1 antigen was found in 78.57% of symptomatic dengue cases. Aedes aegypti was the predominant Aedes mosquito species identified in prospected neighborhoods, however, Aedes albopictus was the main species in peripheric districts. All the Stegomya indices were higher than the WHO threshold for Aedes Aegypti, showing that it is the main species responsible for dengue transmission in Douala.

**Conclusions**
Although neglected, dengue fever is highly prevalent among acute febrile illnesses in Douala,

the biggest city of Cameroon and is mainly transmitted by Aedes aegypti.

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## SARS-CoV-2 antibody seroprevalence in Togo, May-June 2021: a cross-sectional, nationally representative, age-stratified household serosurvey

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Seroprevalence, SARS-CoV-2, general population, Togo

**Introduction**
The extent of SARS-CoV-2 circulation in African countries is still unclear. seroprevalence studies are a common approach to epidemiological surveillance, allowing estimation of the proportion of people who have had contact with the virus. We aimed at estimating the seroprevalence of anti-SARS-CoV-2 antibodies and associated factors in Togo at the national level in 2021 according to age groups, gender, and place of residence (rural or urban).

**Methods**
From 15 May to 31 June 2021, we conducted a nationally representative cross-sectional serological survey in 12 health districts (two districts per health region) in the >5 years old population in Togo. The Wantai SARS-CoV-2 total antibody assay S protein receptor-binding domain-based ELISA (Wantai Biological Pharmacy Enterprise Co.; Beijing, China) was used to determine the presence of SARS-CoV-2 total antibodies in plasma. Crude and weighted seroprevalences (weighted by age, sex and place of residence) were calculated and then weighted seroprevalences were adjusted according to sensitivity and specificity of the ELISA test. Finally, logistic regression models were performed in order to describe factors associated.

**Results**
A total of 7,593 participants, aged 6 to 99 with a median of 32 years (interquartile range, IQR = 17 - 44) and in majority women (54.8%) were included. The overall weighted and adjusted seroprevalence of total anti-SARS-CoV-2 antibodies was 65.5% (95%CI:18.9 - 21.1). In the multivariable binary logistic model for teh whole sample, urban dwellers (AOR=1.21; 95%CI:0.99-1.48), young adults (30-49 years) (AOR=1.53; 95%CI:1.15-2.04) and vaccinated individuals (AOR=2.94; 95%CI: 2.14-4.04) were more likely to be seropositive.

**Conclusions**
The high seroprevalence we observed is consistent with observations across West Africa. Quantification of the level of immunity in the population is needed to know how close we are to herd immunity. In the meantime, vaccination against the COVID-19 remains necessary.

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## Intravenous iron supplementation during pregnancy does not increase infectious disease risk in early childhood in Southern Malawi: a follow-up of a randomized controlled trial

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
anaemia, iron deficiency, malaria, diarrhoea, infants

**Introduction**
Child morbidity in low- and middle-income countries (LMICs) is mainly driven by infectious diseases. Higher iron status in infants is associated with increased infection risk in this setting. Improved maternal iron status during pregnancy predicts higher iron status in infants. Compared to oral iron, intravenous (IV) iron significantly improves maternal iron stores and is considered for treating the highly prevalent anaemia in pregnancy in this setting. With several studies reporting higher iron status in infants of mothers with higher antenatal iron status, infants born to iron-replete mothers, enhanced by IV iron supplementation, could be at a greater infectious disease risk in this setting. This study aimed to determine whether children born to anaemic women who received IV iron during pregnancy have an increased risk of infectious disease-related morbidity in the first postpartum year compared to oral iron in Malawi, a LMIC.

**Methods**
692 infants from a randomized controlled trial comparing IV to oral iron to treat anaemia in pregnancy in Blantyre and Zomba districts in Malawi (ACTRN12618001268235), were longitudinally followed up from birth to 12 months of age. Data on all their medical care was followed in dedicated study clinics. We also routinely administered a morbidity questionnaire and conducted routine clinical and laboratory assessments every three months. The primary outcome was a composite incidence of clinical malaria, diarrhoea, or respiratory tract infections.

**Results**
Preliminary results, the incidence of disease was lower amongst infants born to mothers randomized to IV iron compared to oral iron, but the difference was statistically non-significant (1.81 versus 1.92 per person-year, incidence rate ratio (IRR) 0.76 [95% CI: 0.4-1.45]) p = 0.79.

**Conclusions**
There was no evidence that the use of IV iron in pregnancy increases infant's infectious disease risk, implying that IV iron could be safe to use in LMIC.

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## CONNAISSANCES ATTITUDES ET PRATIQUE SUR LA TRANSMMISSION DE LA MALADIE DE CHIKUNGUNYA AU TCHAD EN 2020

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Tchad Chinkungunya enquête CAP

**Introduction**
L'épidémie de Chikungunya a été déclarée officiellement sur la ville d'Abéché le 28/08/2020. Etant donné que c'est pour la toute première fois qu'elle survient dans cette ville. Une enquête CAP a été réalisé en Août 2020 dans ladite ville touchée.

**Methods**
L'étude était transversale descriptive. L'échantillonnage en grappe (30) proportionnel à la taille de la population a deux degrés était appliquée. Les données étaient collectées par des enquêteurs, au moyen des formulaires papiers. Les fréquences relatives des variables d'intérêt étaient calculées avec leur intervalles de confiance à 95% avec le logiciel STATA 16 version.

**Results**
286 chefs de ménages ont été interrogés dont l'âge médian était de 37ans, 50,09% étaient de sexe masculin, 45% avaient un niveau d'étude primaire. Quatre-vingt-douze pour cent, (92,26%) connaissaient bien les signes de Chikungunya, 88% savaient que le moustique était vecteur de la maladie, qu'íl se développait dans les pots de fleurs (81%), eau stagnante (79%), boite vide (67%). Vingt-trois pourcents (23%) des répondants croyaient que la maladie était une malédiction. Les moyens de protection cités étaient : moustiquaire (90%), répulsif (40,9%), port des manches longues (44%), usage des insecticides (31%). 80% des répondants ont été sensibilisés à travers au moins un canal de communication. 63% croyaient en l'efficacité du traitement moderne. Pour se protéger, 48,25% des participants ont déclaré avoir utilisé la moustiquaire, 29% avaient porté les manches longues, 28% avaient procédé à l'assainissement du milieu, 26% avaient utilisé les répulsifs et 20% les insecticides. 38% des patients avaient consulté uniquement dans les centres de santé publique.

**Conclusions**
Pour la gestion de cette l'épidémie, il serait nécessaire d'intensifier la sensibilisation sur les bonnes pratiques, renforcer l'engagement communautaire dans la destruction des gites larvaires, renforcer le système de surveillance et la prise en charge.

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# Prevalence of pulmonary tuberculosis among tanzanite mineworkers, Tanzania:A cross-sectional study June,2021

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
mineworkers, TB, HIV, tanzanite, Sub-Sahara Africa.

**Introduction**
Tuberculosis remains an important public health problem in developing country especially in this era of HIV/AIDS. Mineworkers have been shown to have a very high risk of becoming infected with tuberculosis (TB), especially in Sub-Saharan Africa. However there is paucity of information on the prevalence of PTB among Tanzanite mineworkers that can be used to guide intervention and inform policy. We determined the prevalence of PTB and its associated characteristics.

**Methods**
Across-sectional study was conducted in Mererani mining site between March and June2021.Mineworkers, who met inclusion criteria were randomly selected and interviewed using a standard questionnaire to obtain information regarding socio-demographic and potential risk factors. Sputum samples were collected and analysed using AFB and Gene Xpert while blood samples were subjected to HIV rapid test, using SD Bioline HIV 1/2 3.0 as a screening test and Uni-gold as confirmatory test.Data was analysed using Epi Info version 3.5.1 and Microsoft excel.

**Results**
A total of 293 mineworkers were recruited. Their median age (±SD) was (35years±9.98), with a range of 18 to 73 years. Of 293 sputum samples, 26 (8.9%) were positive for PTB while 13 (4.5%) of the 291 blood samples were positive for HIV infection, while 5(1.7%) of the miners had PTB/HIV co-infection. The odds of developing PTB was 10.2 (AOR 10.2 95% CI 1.38-75.44) times higher among those who were exposed to silica dust, 9.1 among those infected with HIV (AOR 9.09 95% CI 2.39-34.06), 2.1 among smokers (AOR 2.07 95% CI 1.78-5.52), and 2.8 among those without knowledge of TB transmission (AOR 2.76 95% CI 1.95-8.00).

**Conclusions**
The prevalence of PTB in mineworkers was high (8.9%) and was significantly associated with HIV infection, smoking and exposure to silica dust of TB transmission. Control of TB in Mererani would need to address these factors..

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## Behavioural risk compensation among Female Sex Workers using HIV oral Pre-Exposure Prophylaxis in Nairobi Kenya, August 2020.

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Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Risk Compensation, HIV Oral PrEP, Female Sex Workers, Drop-In Centres, Nairobi.

**Introduction**
Oral PrEP is an HIV chemoprophylaxis strategy, using a combination of two Anti-retroviral drugs; TDF/FTC, taken daily orally by persons at substantial ongoing risk of HIV. Oral Prep can prevent HIV by up to 95% with good adherence and was recommended for use by the WHO in 2012. Risk disinhibition among users, however, poses fear of increased risk of sexually transmitted Infections (STIs). This study sought to determine the effects of oral PrEP use on condom use, and on the number of sexual acts among female sex workers in Nairobi.

**Methods**
Six-month retrospective cohort study was conducted among FSWs comparing PrEP and non-PrEP users accessing services in selected Drop-in Centers (DICEs). Multi-stage sampling was used with a sample size of 168 in each study group. Data was collected using structured data abstraction tool and analysed in STATA. T-test was done to determine differences in mean, and linear regression, to determine relationships

**Results**
There was no significant difference in mean condom use between PrEP and non-PrEP users from month one to month five, but significant at month six, with mean condom use of 4.3 and 5.0 PrEP and non-PrEP respectively (P=0.05, 95%CI). There was a 0.38 mean reduction in condom use among PrEP users, although, not statistically significant (P=0.179, 95%CI). Mean sexual acts per day were significantly higher among PrEP users with a 1.0 increase in mean sexual acts among PrEP users (P=0.004, 95%CI).

**Conclusions**
PrEP use did not significantly lead to a reduction in condom use, but the mean sexual acts remained higher among PrEP users, which has consequent implications on an increased risk of acquiring STIs, that still remain of Public Health concern, prompting the need for emphasis on combination prevention during PrEP use.

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## A cross-sectional Survey of Public Knowledge of the Monkeypox Disease in Nigeria,2022.

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Monkeypox, Awareness, MPXD, Nigeria.

**Introduction**
The Monkeypox Disease (MPXD) has gained attention due to its widened geographical distribution outside of Africa and also due to the novel sexual transmission route. The index case in Europe was from a Nigerian traveler. This study assessed public awareness and knowledge of the MPXD by conducting an online, cross-sectional survey of educated Nigerians.

**Methods**
The study participants were recruited using the snowball sampling method. A total of 822 Nigerians were included in this study. Northeastern geopolitical region had the highest number of respondents(30.1%, n = 220).

**Results**
Our study participants had high awareness of MPXD (89%, n = 731/822) but only 58.7% (n = 429/731) of them had good knowledge of MPXD with a mean knowledge score of 5.31 ± 2.09. The main knowledge gaps were in the incubation period of the disease, the signs and symptoms, its mode of transmission, and preventive practices needed to curb the spread of the Monkeypox virus(MPXV). Specifically, only 24.48% (n = 179) knew that MPXV can be transmitted via sexual contact. Most of the study participants (79.2%, n = 651) opined that we can prevent the occurrence of public health emergencies in future. The multivariable logistic regression analysis revealed that the male gender (OR: 1.69; 95% CI: 1.22,2.33); Ph.D. level education (1.44; 95% CI: 0.48,4.23); and being homosexual (OR:1.65; 95% CI: 0.71,3.78) were significantly associated with good knowledge of MPXD.

**Conclusions**
Despite the varying prevalence across the country, the region of residence within Nigeria did not influence the knowledge of MPXD among the respondents. Despite high educational status of the majority of our respondents, there were gaps in the knowledge of the MPXD in Nigeria. Therefore, risk communication must be intensified with a focus on modes of transmission and the preventive measures needed to curb the spread of MPXV using an integrated one-health approach.

## 593

## Seroprevalence study on leptospirosis in high risk groups of Casablanca Region , Morocco.

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
leptospirosis,high risk work,seropositivity,ELISA,MAT,Morocco

**Introduction**
Leptospirosis is a bacterial zoonosis of public health concern worldwide associated occupational activities. This is a first study conducted in Morrocco with an objective to determine the seroprevalence of leptospira among high-risk groups and to identify their risk factors.

**Methods**
We conducted a cross-sectional study in three sites. Sera were collected during February 2014 from 209 professional volunteers in the municipal slaughterhouse, 125 in a poultry market and 155 in the port of Casablanca and tested by both ELISA (IGM,IGG) and the Microscopic agglutination test (MAT) with a cut point of 1:50. Information on risk factors including personal data, place of residence, clinical history, potential exposure and preventive measure use were recorded in a questionnaire.

**Results**
The seroprevalence considering a seropositivity by either ELISA or MATwas highest among poultry workers (23.73%) than in fishing workers (11.49%) and abattoir workers (6.21%) ($\chi^2$= 19.93, P <0.0000). 10 serovars were identified (7 icterohaemorrahgiae , 1 australis , 1hardjobovis , 1 non identified).

In the multivariate analysis by logistic regression only a specific place of residence from all the city was found independently associated with seropositivity by either ELISA or MAT (p=0.02). Most of the serovar icterohaemorrahgiae were identified in subjects from a particular professional category (poultry peelers) living in this specific area located near the poultry market.

**Conclusions**
This study demonstrated that poultry market workers were at substantial risk of exposition to leptospirosis because of bad hygienic conditions and presence of rodents in both their workplace and their place of residence. Preventive measures should be taken by local authorities targeting high risk area.

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## Kinetics of SARS-CoV-2 IgM and IgG antibodies three months after COVID-19 onset in Moroccan Patients

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
COVID-19; SARS-CoV-2; antibodies; kinetic; Morocco

**Introduction**
Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become a worldwide pandemic since it emerged in December, 2019. Characterization of the immune response, particularly antibodies to SARS-CoV-2, is important for establishing vaccine strategies. The purpose of this study is to longitudinally evaluate the kinetics of anti-SARS-CoV-2 antibodies against spike protein (S1) for up to 3 months in a cohort of 169 COVID-19 patients.

**Methods**
We enrolled COVID-19 patients at two regional hospitals in Casablanca town in Morocco between March and September 2021. Blood samples were

collected and S-specific IgM and IgG levels were measured by a commercial Euroimmun ELISA. IgM antibodies were assessed 2-5 (D00), 9-12 (D07), 17-20 (D15), and 32-37 (D30) days after symptom onset; IgG antibodies were assessed at these time points plus 60 (D60), and 90 (D90) days after symptom onset.

**Results**

We found that at 3months after symptom onset, 79% of patients had detectable SARS-CoV-2-specific IgG antibodies, while their IgM seropositivity was 19% by 1 month after symptom onset. The IgM level decreased to 0.34 [IQR, 0.19-0.92] at 1 month after symptom onset, whereas the IgG level peaked at D30 (3.10 [IQR, 1.83 to 5.64]) and remains almost stable at D90 (2.95 [IQR, 1.52 to 5.19]). IgG levels were significantly higher in patients older than 50 years than in those younger than 50 years at all follow-up time points ($P < 0.05$). Statistical analysis showed no significant difference in median anti-S1 antibody levels among infected patients based on gender or comorbidities.

**Conclusions**

Our study described the dynamic changes of serum antibodies of patients with COVID-19 and provided insight into the humoral immune response (IgG and IgM) to SARS-CoV-2 during 3 months after disease onset.

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## The High agreement between Automated Platform (Abbott) and Manual Platform (DaAn gene) is in favour of Interoperability for the Molecular Detection of SARS-CoV-2 in Cameroon

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**Conference Track**

Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**

Molecular diagnosis; SARS-CoV-2; rRT-PCR; concordance; Cameroon.

**Introduction**

Molecular diagnosis of COVID-19 is critical to the control of this pandemic which is a major threat to global health. Several molecular tests have been validated by WHO, but would require operational evaluation in the field to ensure their interoperability in diagnosis. In order to ensure interoperability in COVID-19 assays, we evaluated the diagnostic concordance of SARS-CoV-2 between an automated (Abbott) and a manual (DaAn Gene) real-time PCR (rRT-PCR), two commonly used assays in sub-Saharan Africa.

**Methods**

A comparative study was conducted on 287 nasopharyngeal specimens at the Chantal BIYA International Reference Centre (CIRCB) in Yaounde-Cameroon. Samples were tested in parallel with Abbott(detection limit: 500 copies/ml) and DaAn gene rRT-PCR (detection limit: 100 copies/ml).Concordance were evaluated by Cohen's coefficient (k, $k>0.8$: excellent concordance).

**Results**
A total of 273 participants (median age [IQR] 36 [26-46] years) and 14 EQA specimens were included. Positivity was on 30.0% (86/287) Abbott and 37.6% (108/287) DaAn Gene. Overall agreement was 82.6 %( 237/287), with k=0.82 (95%CI: 0.777-0.863), indicating an excellent diagnostic agreement. Positive and negative agreement was 66.67% (72/108) and 92.18 %( 165/179) respectively. Regarding viral load (VL), positive agreement was 100% for samples with high VLs (CT<20). Among 50 discordant results; 72% (36) of samples were positive with DaAn gene but negative with Abbott (median CT: 34 [IQR: 31-35]) and 28% (14) being positive with Abbott but negative to DaAn gene (median cycle number [CN]: 26 [IQR: 24 - 29]. Among positive SARS-CoV-2 cases, the mean difference in cycle threshold (CT) for the Manual and cycle number (CN) for the Automated was 6.75±0.3.

**Conclusions**
The excellent agreement (>80%) between the Abbott and DaAn gene rRT-PCR platforms supports inter-operability between the two assays. Discordance occurs at low-VL, thus underscoring these tools as efficient weapons in limiting COVID-19 community transmission.

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## When an Epidemic and a Pandemic Collide: Impact of the COVID-19 pandemic on Monkeypox Incidence and Spread in Nigeria

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Monkeypox, COVID-19, Surveillance, Incidence, Correlation Analysis

**Introduction**
Monkeypox is a re-emerging, viral zoonotic disease, with a recent epidemic in prior non-reporting countries. Outbreaks of the disease have occurred in Nigeria, with yearly reports of since its re-emergence in 2017. We aim to investigate the impact of the COVID-19 pandemic on the incidence and spread of Monkeypox in Nigeria.

**Methods**
We carried out a secondary analysis of epidemiological data of Monkeypox and COVID-19. Data was sourced from weekly situation reports of the Nigeria Centre for Disease Control. We collected data on confirmed cases of Monkeypox and COVID-19 across 37 states, from 2017 to 2022, and 2020 to 2022 respectively. Data from 2017 to 2019 were classified as pre-COVID, while data from January 2020 to August 2022, were classified as intra-COVID. Population data was obtained from World Bank projections. Descriptive statistics was used to report frequencies, while Spearman rank's correlation was used to determine the correlation between number of COVID-19 cases and number of monkeypox cases across states. Analysis was carried out using Stata version 17.

**Results**
The frequency of Monkeypox increased from 184 cases prior to the COVID-19 pandemic, to 318 during the pandemic, representing a 72% increase. Cumulative incidence of Monkeypox increased from 10 cases per million population prior to the pandemic, to 15 cases per million during the COVID-19 pandemic. Monkeypox cases were reported across 17 states before the pandemic, and 30 states during the pandemic. Correlation analysis showed a positive association between number of monkeypox cases and COVID-19 cases across states in the intra-COVID era (r=0.510, p:0.001, 95% confidence interval: 0.235, 0.786).

**Conclusions**
There has been an increase in the incidence and spread of Monkeypox during the COVID-19 pandemic in Nigeria. We recommend that response strategies be implemented that target both monkeypox and COVID simultaneously. Preventive strategies for monkeypox, such as vaccinations, should be adopted in Nigeria.

## 620

## Comparative study of Swab and Crust for the detection of Monkeypox Virus at National Reference Laboratory Abuja, Nigeria: 2017 - 2022

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Monkeypox virus, Swabs, Crusts, Orth poxvirus, Threshold cycle

**Introduction**
Human monkeypox (MPX) is a viral zoonotic febrile illness caused by the monkeypox virus. Globally, the incidence of MPX has increased. In Nigeria, MPX outbreaks occurred in 2017 with 132 confirmed cases and seven deaths across 17 states. The re-emergence of MPX in 2022 resulted in 277 morbidities and six mortalities across 30 states. This study aims to compare the efficacy of monkeypox sample types tested at the National Reference Laboratory (NRL), Abuja to guide recommendations in low-resource settings.

**Methods**
This retrospective cross-sectional study reviewed 56 records of MPX tests conducted at NRL between 2017 and 2022. Cycle Threshold (CT) values of the simultaneously tested swab and crust specimens (n=134) were recorded regardless of whether the samples tested positive, negative, or indeterminate (inconclusive). Samples were selected irrespective of the subject's age, gender, or onset of symptoms and analysed using real-time PCR while ascertaining quality controls. Data were analysed using paired sample t-test and Pearson correlation test at 95% confidence levels.

**Results**
Out of 134 samples only 91 were used for the comparative analysis. Of these, 27 (29.7%) swabs and 26 (28.6%) crusts were positive for MPX respectively. Of the swabs, 58 (63.7%) were negative and six (6.6%) were indeterminate while for the crusts 61 (67%) were negative and four (4.4%) indeterminate. The mean CT values were 25.37 + 7.26 and 25.73 + 7.58 for swabs and crusts respectively. A strong positive correlation was established between swabs and crusts with a coefficient of 0.73.

**Conclusions**
The CT values of swabs and crusts are strongly and positively correlated. There is no statistically significant difference between the means and variances of the two groups. Based on our findings, either swabs of lesion exudate or lesion crusts can be used in the laboratory diagnosis of MPX, and not both, especially in resource-limited settings.

## 637

## Routine sterile glove and instrument change at the time of abdominal wound closure to prevent surgical site infection: pragmatic, cluster randomised trial in seven low and middle income countries (ChEETAh)

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Surgical site infection; surgical gloves; surgical instruments; global surgery; cluster randomised trial; low- and middle-income countries.

**Introduction**
Surgical site infection (SSI) remains the most common complication of surgery around the world. The World Health Organisation does not make recommendations for changing gloves and instruments prior to wound closure due to a lack of evidence. This study aimed to test whether a routine change of gloves and instruments prior to wound closure reduced abdominal SSI.

**Methods**
ChEETAh was a multicentre, cluster randomised trial in seven low- and middle-income countries (Benin, Ghana, India, Mexico, Nigeria, Rwanda, South Africa). Clusters were randomised to current practice versus change of gloves and instruments prior to wound closure. Consecutive patients undergoing abdominal surgery for a clean-contaminated, contaminated, or dirty operation were identified and included. The primary outcome was SSI within 30 days after surgery, using US Centres for Disease Control criteria. The trial has 90% power to detect a minimum reduction in the primary outcome from 16% to 12%, requiring 12,800 participants from at least 64 clusters.

**Results**
Between June 2020 and March 2022, 81 clusters were randomised (39 intervention, 42 control), 13,301 consecutive patients included (7,157 to current practice and 6,144 to intervention arm). Overall, 89% (11825/13301) of the patients were adults, 46% (6125/13301) underwent elective surgery, and 61% (8086/13301) underwent surgery that was either clean/contaminated or 39% (5215/13301) contaminated/dirty. Glove and instrument change took place in 0.1% (58/ 7157) of current practice arm patients and 98% (6044/6144) of intervention arm patients. The SSI rate was 19% (1280/6768) in the current practice arm versus 16% (931/5789) in the intervention arm (adjusted risk ratio: 0.87, 95% CI 0.79-0.95). There was no evidence to suggest heterogeneity of effect across any of the pre-specified subgroup analyses

**Conclusions**
This trial showed a robust benefit to routinely changing gloves and instruments before abdominal wound closure. It should be widely implemented into surgical practice around the world.

## 913

## Epidemiology, diagnostics and factors associated with mortality during a cholera epidemic in Nigeria, October 2020–October 2021: a retrospective analysis of national surveillance data

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Keywords: Cholera, RDT Kits, Mortality, Nigeria

**Introduction**
About 2.8million cholera cases and 91,000 deaths occur annually in endemic countries. In 2019, the Africa region experienced a marginal decrease in the case fatality rate (CFR) of cholera in comparison with the 2018 estimates, however in Nigeria, the CFR increased by 3.5% in the same year. furthermore, an epidemic of cholera occurred from the latter part of 2020 and most part of 2021. This study describes the epidemiology, diagnostic

performance of rapid diagnostic test (RDT) kits and factors associated with mortality for the period under review.

**Methods**
A retrospective analysis of national surveillance data was conducted. A case was any person with acute watery diarrhoea, with or without vomiting between October 2020 and October 2021. Frequencies and proportions were used to summarize categorical variables; mean and SD for normally distributed continuous variables. Cholera RDT kit was validated by comparing with laboratory culture results to determine its sensitivity, specificity, positive and negative predictive value. Logistic regression was done to determine the predictors of cholera death, at $\alpha < 0.05$.

**Results**
A total of 93,598 cholera cases with CFR of 3.5% were reported. Males aged 5–14 years and females aged 25–44 years were more affected. The overall AR was 46.5 / 100 000 persons. The North-West region had the highest AR of 102 /100 000. Age group 45-64 years (aOR 1.60; 95% CI 1.39 to 1.83), male (aOR 1.28; 95%CI 1.19 to 1.37), resident in the North-Central region (aOR 1.49; 95%CI 1.32 to 1.68) and severe dehydration (aOR 4.04; 95%CI 2.36 to 9.82) significantly increased the odds of cholera deaths. The cholera RDT had excellent diagnostic accuracy (AUROC=0.91; 95% CI 0.87 to 0.96).

**Conclusions**
Cholera remains a public health threat in Nigeria with a high mortality rate. Thus, we recommend making RDT kits widely accessible for improved surveillance and prompt case management.

## 940

## Frequency and factors associated with inappropriate antibiotic prescriptions during Integrated Management of Childhood Illness (IMCI) consultations among children aged 2-59 months in primary health centers Burkina Faso, Guinea, Mali, June 2021 to February 2022

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
antibiotics, inappropriate prescribing, IMCI guidelines, under-five children, Primary health care, West Africa

**Introduction**
Emergence of antibiotic resistance is a major public health concern. In low-income countries, research assessing appropriateness of antibiotic prescriptions is scarce, and mainly hospital-based. We analyzed antibiotic drug prescriptions and correlates of inappropriate prescriptions, in children aged 2-59 months following IMCI consultations in primary health centers (PHCs) in three West African countries (Burkina Faso, Guinea and Mali).

**Methods**
A multicenter cross-sectional study of all children aged 2-59 months seen as outpatients who received an IMCI consultation in four public PHCs per country was conducted between June 2021 and February 2022, as part of the AIRE research project,

UNITAID-funded. To identify inappropriate antibiotic prescriptions, a standardized algorithm was developed based on national IMCI guidelines. Two types of non-compliance were considered based on the non-proprietary name of antibiotic prescribed: either the antibiotic wasn't recommended but prescribed (over-prescribing), or it was recommended but not prescribed (missed treatment opportunity). In Mali, correlates of inappropriate antibiotic prescribing were analyzed using mixed-effects logistic regression models with a random effect on the inclusion site.

**Results**
Among the 6,796 children included, a significant proportion of IMCI consultations (65.5%) resulted in the prescription of >1 antibiotic. Over-prescription and missed opportunity for antibiotic treatment concerned 37% and 18.1% of children respectively. In Mali, young age (2-11 months), household density >5 persons, hypoxemia and previous antibio-therapy were independent factors associated with over-prescription for the sub-population of IMCI simple and moderate cases. Similarly, the use of a malaria RDT was negatively associated with missed opportunity for antibiotic treatment.

**Conclusions**
The frequency of inappropriate antibiotic prescriptions was high in children under-5 at the PHC level in the three countries studied. Understanding the determinants of inappropriate antibiotic prescribing will enable health authorities and policy makers to design relevant targeted interventions to promote a better rational use of antibiotics in PHC in Africa.

## 1200

## Incidence and Epidemiological Characteristics of Influenza Associated with Hospitalized Acute Respiratory Illness, Damanhour, Egypt, 2009-2017

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Influenza, ARI, Population-based Surveillance, Incidence Rate.

**Introduction**
Influenza is of global public health concern. Globally, influenza causes 290,000 to 650,000 deaths annually. Limited influenza incidence data are available in the Middle East or Egypt. We aim to describe the epidemiology of influenza associated with hospitalized acute respiratory illness (ARI-Influenza) in Damanhour district, Egypt.

**Methods**
From 2009-2017, population-based ARI surveillance was conducted in Damanhour district. ARI cases were eligible if they were hospitalized, had ≥1 signs of acute infection and ≥1 respiratory symptoms. Nasopharyngeal/oropharyngeal (NP/OP) specimens were analyzed by real-time, reverse transcription polymerase chain reaction for influenza types and subtypes. A health utilization survey conducted in 2012 was used to estimate the incidence rate (IR) of hospitalized ARI-Influenza.

**Results**
Of the 16,782 ARI cases enrolled, 15,984 NP/OP specimens (95.2%) were tested for influenza and 16.7% were positive: 9.7% for influenza A and 7.0% for influenza B. The median age of hospitalized ARI-Influenza cases was 25 years (IQR 5.2-48.0). Males and rural residents represented 53.3% and 79.6% of cases, respectively. The median duration of illness and hospitalization were 5 (IQR 4-7) and 3 (IQR 2-5) days, respectively. Twelve (0.5%) cases died during hospitalization. The overall hospitalized ARI-influenza IR was (44.9/100,000 persons) with the lowest annual IR in 2011 (21.5/100,000 persons) and the highest in 2016 (84.7/100,000 persons). The highest IR was among children <5 years (102/100,000 persons).

**Conclusions**
There is a considerable burden of Hospitalized ARI-influenza in Damanhour district. Incidence data are critical to direct prevention and control strategies,

including the development of national guidelines for high risk group vaccination and treatment.

## 1251

## Optimizing the use of SARS-Cov-2 antigen rapid diagnostic tests for timely Detection and Effective Response to COVID-19 in key border communities in Uganda, May – September 2022.

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
SARS-Cov-2, RDTs, transmission, Uganda

**Introduction**
Congestion and heavy human traffic in places where people congregate make them high risk places for SARS-CoV-2 infection transmission. These setting may benefit most from early detection of SARS-CoV-2 infections and management of cases and contacts for transmission reduction. We evaluated the feasibility and utility of the SARS-Cov-2 antigen rapid diagnostic testing (SARS-CoV-2 Ag-RDT) for timely detection and effective response to COVID-19 in high-risk border communities in Uganda.

**Methods**
Between May and September 2022, cross-sectional surveys were conducted in schools and markets in the border districts of Busia and Tororo, Uganda. Monthly surveys were conducted in 11 schools and 2 markets. These were match with control schools and markets where testing was only at baseline and endline. A questionnaire adopted from the Uganda Ministry of Health was administered to volunteers to collect demographic and clinical data. SARS-CoV-2 Ag-RDT testing was conducted in all participants. Symptomatic cases were managed according to national guidelines. All cases were recommended to isolate. Tracing and testing of contacts to cases was done. Cases were followed up on day 5 to determine adherence to isolation recommendations.

**Results**
A total of volunteers 8,981 were enrolled. The overall Ag-RDT test positivity rates was 1.6%, with schools recording higher rates than markets (1.7% vs 0.9% p= 0.035). A total of 552 contacts were identified of whom 508 (92.0%) agreed to the testing. Test positivity rate was higher among contacts than index participants (9.3% vs 1.6%). Endline positivity rates were lower in settings that had received monthly testing compared to controls (0.7% versus 2.1%, p= 0.015). Only 73 (39.5%) of the cases effective isolated.

**Conclusions**
Routine SARS-CoV-2 Ag-RDT testing is feasible and may be effective in reducing SARS-CoV-2 infections in schools and markets, however, measures to ensure isolation of cases may be required to improve its utility.

## 1397

## SARS-CoV-2 virus genomic and epidemiological dynamics: Two years of COVID-19 pandemic management in Rwanda

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
SARS-CoV-2, COVID-19, phylogenetic time tree, genomics

**Introduction**
While the SARS-CoV-2 virus had a wide genomic evolution leading to potentially dominant and persistent variants, genomic analysis towards tracking such important viral dynamics was rarely performed in the most resource constrained settings. We studied the genomic and epidemiological dynamics of the SARS-CoV-2 virus in Rwanda to draw comparisons between specific COVID-19 epidemiological metrics and genomics data pointing to persistent dominant variants at specific points in time.

**Methods**
To identify the persistent SARS-CoV-2 variants during the studied time intervals in Rwanda, an interactive phylogenetic time tree generated using the Nextstrain tool was considered. The tree was constructed using 783 genome sequences sampled nationwide between May 2020 and January 2022. The samples considered represent approximately 0.6% of the cumulative case counts within this period. Timeseries insights pertaining to dominant variants within the community were then compared with the number of confirmed cases, deaths, vaccinations, and recoveries. Observations were split into 6 months intervals.

**Results**
The number of confirmed cases and deaths due to COVID-19 was highest in the period between June 1st 2021 to November 30th 2021 with 73,386 cases and 986 deaths. During this timeframe, most of the sequenced samples had Delta as the variant of concern (VOC). The period between December 1st 2021 to May 31st 2022 had the second highest number of confirmed cases (29,708) with a significantly lower number of deaths (117). During this timeframe, most of the sequenced samples had Omicron as the VOC. The share of people who received at least one dose of the COVID-19 vaccine beyond December 2021, doubled compared to the period prior (67.31% in comparison to 35.47%).

**Conclusions**
Our analysis showed a pertinent dynamic of variants. These insights can inform policy on effective interventions, particularly on appropriateness of vaccines as well as tracking their impact on specific variants.

## 1432

## IGRA Conversion and Reversion of Health Care Workers with Latent Tuberculosis Infection in North Central Nigeria

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Conversion, reversion, IGRA, Healthcare Workers, Latent TB infection.

**Introduction**
Interferon-gamma release assays (IGRAs) have been employed in the serial testing and definitive diagnosis of latent TB. This enhanced detection and precise informed treatment of patients led to the reversal of the condition. However, relatively few studies reported HCWs exposure and IGRA responses over time, particularly in Nigeria. We, therefore, evaluated the rate of reversion and conversion amongst health care workers with latent tuberculosis infection in North Central Nigeria.

**Methods**
In this longitudinal cohort study, we enrolled HCWs over a period of 3 months from selected HIV clinics in North Central Nigeria. After ethics, approval consented participants were screened using a standardized structured semi-interviewer-based assessment. QuantiFERON-TB Gold-Plus (QFT-Plus) was used for IGRA testing at baseline and follow-up. IGRA conversion was defined as a positive QFT-Plus (IFN-$\gamma \geq 0.35$ IU/mL) result after two consecutive QFT-Plus negatives (IFN-$\gamma < 0.35$ IU/mL) results. In contrast, IGRA reversion was defined as a negative QFT-Plus result after two consecutive QFT-Plus

positive tests. STATA version 15.0 was used for statistical analysis.

**Results**
Of the 1043 participants tested at baseline, 643 participants (excluding 400 QFT-Plus positive results) were enrolled and serially tested for follow-up visits (Months 6, 12 and 24). Using month 6 as the baseline, the IGRA conversion rate was 9.5% (39/409) at month 12 and 12.1% (37/305) at month 24 while IGRA reversion rates were 36.4% (51/140) and 40% (34/85) respectively.

**Conclusions**
Healthcare workers have a high conversion rate burden in north central, Nigeria. Understanding immunological markers that triggered their conversion or reversion is critical to inform treatment decisions and future research.

## 1438

## Multidrug-resistant Klebsiella pneumoniae outbreak in Sahloul University Hospital of Tunisia -July - August 2022

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**Conference Track**
Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**
Klebsiella pneumoniae, Drug Resistance, Multiple Disease Outbreaks, Tunisia

**Introduction**
Alerts were received by the Prevention and Safety Of Care Department of Sahloul University Hospital on 27 and 29 July 2022 concerning three cases of invasive infections with multidrug-resistant Klebsiella pneumoniae. The reports were issued by the microbiology laboratory and the three hospital departments where the cases occurred: Post serious operations service 'PSOS'; Surgical Reanimation service and Orthopedic service.

**Methods**
A case was defined as any patient with multidrug-resistant Klebsiella pneumoniae Healthcare Associated Infection that was retained during the period 27 July to 12 August 2022. The identification was carried out mainly on the basis of laboratory data, a review of medical records, and all potential sources of information.

An environmental investigation was implemented in the units where the infected patients were treated. Samples were taken using swabs and sent to the regional laboratory of environmental hygiene of the regional directorate of Sousse.

An audit was performed by observing the standard hygiene precautions in the three units concerned in relation to the following six criteria: hand hygiene, types of equipment and personal protection care trolley, Antiseptics, nursing, and general hygiene.

**Results**
This epidemic involved three cases of patients with intrinsic (morbidities) and extrinsic (invasive procedures: gastrostomy, vascular catheterization, urinary catheter) risk factors. The three isolated strains had the same antibiotype characterized by resistance to all antibiotics except Fosfomycin and colistin.

The environmental survey didn't monitor any Klebsiella pneumoniae in the three patients' environments.

From the six criteria of the standard hygiene precautions, 16 observations were tested in the audit, from which (10;62.5%) were respected in the Surgical Reanimation service, (8; 50%) in the PSOS and (2; 12.5%) in orthopedic service.

**Conclusions**

The rapid identification of outbreaks of healthcare-associated infections based on a reactive surveillance system, and the implementation of corrective measures have made it possible to stop the spread of these multi-resistant infections.

## 1497

## Neonatal Sepsis outbreak investigation at Neonatal care unit of Kibogora DH, Rwanda,2022

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**Conference Track**

Track 1: Epidemiology, Diagnostics and Clinical Management of Emerging and Re-emerging High Consequence Infectious Diseases (HCID), in Africa

**Keywords**

Neonatal, sepsis ,outbreak, NCU, Klebssiella

**Introduction**

An increase of unusual complications among neonates was experienced at Kibogora District Hospital Neonatal Care Unit (NCU) since 15th April,2022. The rapid response team conducted an investigation to evaluate the magnitude of the problem and establish the preventive and control measures

**Methods**

Hospital based cross section study encompassing clinical records review of one month before the confirmation of the increase of cases. A case was defined as any neonate admitted in neonatal care of Kibogora DH since 29th march 2022 up 25th April 2022 one or more of followings: fever,respiratory,tahcypnea,tachycardia or desaturation .Line list was established and completed for all neonates presenting similar symptoms. Blood sample were taken and sent to National Reference Laboratory (NRL) for culture and drugs sensitivity pattern. New neonates were referred the NCU was temporally stopped receiving new neonates. Daily NCU environment cleaning and disinfection using 0.5% Chlorine was initiated and monitored. Data were entered, analyzed through Microsoft Excel and descriptively characterized

**Results**

Of them, 23.1%(15/67) had sepsis of whom two death were recorded. Male affected were (67%). In all, 26.7% were preterm while the majority were born by spontaneous vaginal delivery mode (73.4%). Only 26.7% were born by C/S mode. Main symptoms presented by neonates included: severe respiratory distress (87%); tachypnea (67%); Fever(33.4%); tachycardia(27%) and desaturation (27%). Microbiological investigations by NRL confirmed that 6 out of 9 (66.7%) isolated the coagulase negative staphylococcus (2/6); Enterobacter aerogenes (1/6) and escherichia coli (1/6) and klebsiella gram negative Rod stain(2/6) which were sensitive to Meropenem, doxyclin and tetracycline.

**Conclusions**

Bacterial infection was the leading cause of the neonates complications, and improved infection prevention and control (IPC) should prevent the reoccurrence of the problem.
Regular bacteriological surveillance and NCU environment swabbing were recommended

## Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

## Oral Presentation

### 245

### Innovative Novel Diagnostic Marker of Bacterial Infection Versus Current: Procalcitonin (Novel) Versus C-Reactive Protein(CRP) and White Blood Cell Count (WBC) (Current) for the Diagnosing of Bacterial Infections in Feverish Patients With/no Culture Results as Gold Standard in Cameroon-Africa.

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
C-reactive protein , procalcitonin ,White blood cell count , fever ,infection and rapid diagnosis

**Introduction**
In Cameroon, the identification of bacterial infection in fever is done through culture or hemoculture with results available after 3 to 7 days respectively and patients are often placed on unnecessary antimicrobial therapy which might lead to drug resistance threatening global public health.

Therefore there is a need for more rapid, specific biomarker of bacterial infections in patients.

STUDY OBJECTIVE - Use procalcitonine (PCT), C-Reactive Protein (CRP) and White Blood count (WBC) as diagnostic tools for bacteria detection while awaiting the hemoculture results.

RESEARCH QUESTION - What correlations exist between level of PCT, CRP, WBC and hemoculture results?

**Methods**
STUDY DESIGN: Analytical study.

STUDY SETTING: Blood samples were aseptically collected in hospitalised patients then analyse for hemoculture and serological titration of WBC,CRP and PCT.

STUDY POPULATION: Persons of all age groups .

ELIGIBILITY CRITERIA: fever, admitted within 24 h, not yet on anti-infectious treatment.

SAMPLE SIZE: 310 feverish patients.

ANALYSIS: .The diagnostic accuracy of PCT, WBC, CRP was assessed by calculating the sensitivity, specificity and the area under the curve(AUC).

**Results**
From are results;

- The best cut-off value for PCT to detect bacterial infection in the positive hemoculture group was 1.46

ng/ml, with an AUC of 0.75,sensitivty of 100% and specificity of 81.4% .

- For CRP, the best cut-off value to detect bacterial infection was 117ng/ml with an AUC of 0.66, sensitivity of 27.3% and specificity of 74.6%.

- And for WBC, the best cut-off value was 17.7ng/ml with an AUC of 0.445, sensitivity of 27.3% and specificity of 81.4%.

**Conclusions**
PCT showed to have a greater sensitivity, specificity, AUC and a lower cut-off value than other routinely used biomarkers for the rapid diagnosis of bacterial infection. Also, the titration time of PCT is rapid with results avalaible within 30 minutes, this will help to reduce drug resistance that threaten global public health.

## 409

## Pharmaceutical and Vaccine Manufacturing Value Chains that present most compelling Investment Cases for African countries

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Pharmaceutical Vaccine Manufacturing Value Chain

**Introduction**
The estimated value of Africa's pharmaceutical market is expected to reach USD 26 billion representing 2 percent of the global pharmaceutical market (projected at USD 1.44 trillion) by 2022. There are only about 375 pharmaceutical and vaccine manufacturers on the continent; which compares poorly to China and India which, with a similar population to Africa's, have 5,000 and 10,500 manufacturers, respectively. While the need to increase pharmaceutical and vaccine manufacturing in Africa is clear, there has been a paucity of actionable insights on the specific aspects within these value chains that present the most pragmatic starting points ('low hanging fruits'). We sought to empirically establish these 'low hanging fruits' in order to inform investments by African Governments.

**Methods**
We adopted a mixed methods approach to empirically establish the unique aspects within the pharmaceutical and vaccines value chains that present the strongest investment case thus which African Governments can prioritize investments in. We investigated the entire value chain and adjacent industries to the pharmaceutical and vaccine manufacturing ecosystem in Africa, vis-a-vis best practice in other jurisdictions.

**Results**
We demonstrate that most compelling investment cases in the pharmaceutical value chain exist for oral pharmaceutical products that address diseases that cause the highest burden e.g. diarrheal diseases and malaria. Outsized returns are also expected for vaccine formulations for which there are only one or two manufacturers whose manufacturing capacity does not meet demand e.g. malaria, cholera and measles vaccines. Investments in adjacent ecosystems especially in excipient, packaging and vaccine manufacturing equipment ecosystems; as well as in clinical development services and advance market commitment provision are imperative to truly unlock the manufacturing potential in the continent.

**Conclusions**
African Governments need to focus on these priority value chains, optimize tax regimes and enhance political stability to attract investments to these value chains in the continent.

## 565

## Immunomodulatory effect of Moringa oleifera and Phyllantus niruri extracts on anti-HBV cytokine production by human peripheral blood mononuclear cells

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Chronic Hepatitis B, cytokines, Moringa oleifera, and Phyllantus niruri

**Introduction**
Chronic hepatitis B (HBV) infection is one of the leading causes of cirrhosis and liver cancer. The currently approved drugs for the treatment of chronic HBV which include pegylated interferons and nucleoside analogs are believed to have limited efficacies and some adverse side effects. Therefore, there has been a need for the development of safer and more effective antivirals for the treatment of chronic HBV. Since ancient times, medicinal plants have been used in the treatment of numerous diseases and these plants are believed to produce complex and structurally diverse compounds, some of which have antiviral properties. The aim of this study was to evaluate the immunostimulatory properties of Moringa oleifera and Phyllantus niruri leaf extracts in vitro on human peripheral blood mononuclear cells (PBMCs) from chronic HBV carriers and HBV-negative controls

**Methods**
Plant extracts were freezed dried.

Phytochemical analysis was carried out

Whole blood was taken from twenty (20) Chronic HBV patients and (20) uninfected persons.

PBMCs were isolated and MTT assay for cytotoxicity/viability was carried out using different concentrations of the plant extracts.

Luminex multiplex assay was used to determine the cytokines that will be stimulated by the plant extracts.

**Results**
Phytochemical analysis showed that both aqueous and ethanol leaf extracts of the two plants predominantly contained tannins, sterols, alkaloids, flavonoids, saponins, terpenoids, and polyphenols.

Using the MTT assay, we showed that aqueous extracts were not cytotoxic and increased cell metabolic activity while the ethanol extracts decreased cell metabolic activity.

The extracts were found to induce the release of TNF-α, IL-1β, IL-10, IL-6, IFN-γ, and CCL5/RANTES from PBMCs of chronic HBV patients and their uninfected controls.

**Conclusions**
Moringa oleifera and Phyllantus niruri leaf extracts were found to be safe and also stimulate the release of HBV replicating-limiting cytokines and therefore could aid in the treatment of chronic HBV

## 1093

## An Analysis of the Role of Intergovernmental Organizations in Promoting Local Vaccine Manufacturing in Africa. A Case Study of Africa Centres for Disease Control and Prevention (Africa CDC)

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
health policies, regionalism, local vaccine manufacturing, Africa CDC

**Introduction**
COVID-19 pandemic illustrated Africa's dependent on foreign suppliers. The continent because vulnerable to vaccine nationalism, stockpiling and disruptions to global supply because on incapacity to produce its own vaccines. Further, exposing how vulnerable global collaboration may be when faced with a threat from a shared outbreak. Nevertheless, as the role of regional intergovernmental organizations in international relations expands, the integration aspirations and strategies go beyond economic and security to include social policy. Therefore, there are increasingly chances to examine whether and how regional collective action impact health and access to vaccines in the global south by promoting local vaccine manufacturing in Africa. By analyzing Africa CDC as regional intergovernmental organizations in in promoting the local vaccine manufacturing, this paper responds to these queries.

**Methods**
The paper was based on a literature review and complemented by in-depth interviews with experts working with regional health intergovernmental organizations. The study used qualitative research method and thematic analysis. A purposive and convenience sampling of 21 were conducted due to participants' relevance to the topic and easy ability to contact them. Only, 11 participants took part in the in-depth interviews.

**Results**
The findings were that Africa CDC is advocating for collective action at a national, regional and international spheres to expand domestic manufacturing of vaccines. However, lack of finances, technology transfer and intellectual property rights, demand and market, regulatory frameworks, bilateral arrangements posed a threat to this ambitious goal. With member states having bilateral talks with development partners and manufacturers, it was difficult for the continent in approaching local vaccine manufacturing as bloc with anticipated gain to the market.

**Conclusions**
A feasible solution could be that all discussions on local vaccine manufacturing be handled at a regional level, to determine who produces who, market, technology transfer, regulatory and financing.

## 1249

## Vaccine Production in Africa: Review of Current Situation, Opportunities, and Challenges

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Vaccine, Production, Africa, Challenges

**Introduction**
Africa has the highest incidence of mortality caused by infectious diseases and remarkably cannot manufacture vaccines that are essential to reduce mortality, improving life expectancy, and promoting economic growth. The continent is home to 17 percent of the world's population but, due to a lack of manufacturing capacity, can currently produce only 1 percent of its vaccine needs. This study aimed to review the current situation, opportunities, and challenges of vaccine production in Africa

**Methods**
We conducted a narrative review of evidence to answer the aim of the study. The search was conducted in March 2022 and evidence published between March 2018 and January 2022 were

included. Data reported in this article were obtained from reports, literature in peer-reviewed journals found in PubMed, PubMed Central, and ScienceDirect, grey literature, and other data sources. The authors also snowball further data to gather information for this review.

**Results**
24 studies were included in this review. Our findings revealed that few countries in Africa, such as Algeria, Senegal, Nigeria, and South Africa, can produce vaccines however they're unable to export them due to a lack of capacity for testing and not meeting criteria set by the World Health Organization (WHO) with Egypt being the only exception. Our study highlighted the major challenges involved in vaccine production in Africa which include lack of political will, process development, process maintenance, lead time, production facilities, equipment, life cycle management, and product portfolio management.

**Conclusions**
Vaccine manufacturing in Africa requires cooperation between governments, the private sector, and other stakeholders on financing, regulation, licensing, infrastructure, technological adoption, and communication. Policymakers should focus on exploring the various financing options available to them to support the development of Pan-African vaccine manufacturing. They should also develop plans to strengthen the value chain and improve demand certainty for the industry.

## 1381

## Réponse humorale aux antigènes gamétocytaires Pf48/45, Pf230 et Pf47 à Dangassa et Sirakorola, deux zones éco-climatiques différentes au Mali, en 2019.

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Paludisme, Antigènes gamétocytaires, Réponse humorale, Enfants, Mali

**Introduction**
La recherche d'un potentiel candidat vaccin du stade asexué a eu peu de succès à cause de la variabilité antigénique du Plasmodium. Cependant, de nombreuses études s'orientent vers l'identification des antigènes du stade sexué qui pourront constituer de potentiels vaccins bloquant la transmission du paludisme parmi lesquels le Pfs230 et le Pfs48/45. Notre objectif était d'étudier la réponse humorale aux antigènes gamétocytaires (Pf48/45, Pf230 et Pf47) de P. falciparum chez les enfants de 5 à 15 ans à Dangassa et à Sirakorola en 2019

**Methods**
Il s'agissait d'une étude longitudinale allant de juin à novembre 2019 avec deux passages transversaux en début et fin de saison de transmission. Elle a porté sur 576 enfants de 5 à 15 ans dont 289 à Dangassa et 287 à Sirakorola. Un échantillonnage aléatoire simple a été effectuer à partir du fichier de recensement. Pour la participation, les sujets volontaires devaient résider dans la zone d'étude accompagner d'un parent/tuteur consentant pour la participation. Les données ont été collectées à l'aide d'une application Redcap et analysées avec le logiciel stata14.

**Results**
La prévalence de l'infection palustre était de 26,8% à Dangassa vs 14,6% à Sirakorola en novembre 2019. Une augmentation significative de la prévalence des anticorps anti-Pf48/45 (p=0,041) et anti-Pf230 (p=0,0001) a été observée en novembre à Dangassa, une diminution de la prévalence des anticorps anti-Pf230 (p=0,005) a été observée à Sirakorola. Le taux moyen d'anticorps anti-Pf230 était plus élevé chez les deux tranches d'âge en fin

de saison à Dangassa (p=0,001). Cependant, ce taux ne variait pas significativement en fonction des tranches d'âge à Sirakorola en novembre.

**Conclusions**
l'antigènes gamétocytaire Pfs 230 pourrait jouer un rôle important dans le processus de conception d'un potentiel candidat vaccin contre le paludisme.

## Poster

### 170

### ANTIBACTERIAL EFFICACY OF NEEM TREE (Azadirachta indica A. Juss) EXTRACTS ON Staphylococcus aureus

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Antimicrobial, Azadirachtin indica, methicillin resistant Staphylococcus aureus, extract, Neem

**Introduction**
Multiple microbial resistance has been a growing problem and the outlook for more effective antimicrobial drugs in the foreseeing future is still uncertain. This study determined the antibacterial efficacy of neem tree leaf and bark extract on methicillin resistant Staphylococcus aureus as an alternative treatment method.

**Methods**
An in vitro study experiment was performed using neem extracts from leaves and bark which were subjected to aqueous and methanol extraction of its active compounds. Powdered neem leaves and bark were soaked separately in different containers with methanol and water (aqueous) for three days before being filtered into containers and diluted to concentrations of 20%, 40%, 60%, 80%, and 100%. Isolates of MRSA were cultured from swabs of door handles of selected buildings on the University for Development Studies, Nyankpala campus, on Muller-Hinton agar plates and subjected to a standardised antibiotic test. The different concentrations of neem extracts were tested on isolated MRSA incubated on nutrient agar using the Cork borer method. The various zones of inhibition of MRSA by the neem extracts were measured and recorded.

**Results**
Results showed an increasing antimicrobial activity with increasing concentrations of methanol extracts of neem leaf and bark. Clearer zones of inhibitions were observed at a minimum concentration of 60%. There was no positive record of antimicrobial effect of aqueous extract of neem leaf and bark on cultured MRSA. Antibiotics produced clearer and wider zones of inhibition compared to neem extracts. Methanol extract of neem leaves and bark exhibited in the in vitro antimicrobial test of MRSA was effective and yielded greatest zones of inhibition at 100% concentration and minimum zone of inhibition at 60% concentration.

**Conclusions**
It is recommended that further studies should be explored for the best method for extracting the active ingredient of the neem leaf and bark before in vivo studies can be done.

### 194

### In vitro antibacterial and antifungal activities of extracts and fractions of leaves of Ricinus communis Linn against selected pathogens

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Antibacterial; Antifungal; Ricinus communis; Selected pathogens; Crude extracts; Solvent fractions

**Introduction**
Infectious disease impacts are reduced due to the development of antimicrobial agents. However, the effectiveness of antimicrobial agents is reduced over time because of the emergence of antimicrobial resistance. To overcome these problems, scholars have been searching for alternative medicines. Ricinus communis is used as a traditional treatment for bovine mastitis, wound infection, and other medicinal purposes. The objective of the present study was to further evaluate the antimicrobial activities of R. communis leaf extracts and fractions.

**Methods**
R. communis leaves were macerated in methanol and acetone. The methanol extract showed better antimicrobial activity and subjected to further fractionation via increasing polarity of solvents (n-hexane, chloroform, ethyl acetate, and aqueous). Test microorganisms included in the study were six laboratory reference bacteria (Escherichia coli, Staphylococcus aureus, Streptococcus agalactiae, Kleibsella pneumoniae, Pseudomonas aeruginosa and Streptococcus pyogenes), two clinical isolate bacteria (E. coli and S. aureus), and Candida albicans. The agar well diffusion method was employed to determine antimicrobial activity. The minimum inhibitory concentrations (MIC) and minimum bactericidal/fungicidal concentrations (MBC/MFC) were determined through broth microdilution.

**Results**
The results indicated that the best antimicrobial activity for ethyl acetate fraction ranged from 14.67 mm (clinical E. coli) to 20.33 mm (S. aureus) at 400 mg/ml, however, n-hexane exhibited the lowest antimicrobial activity. Among the tested fractions, ethyl acetate fraction showed the lowest MIC values ranged from 1.5625 mg/ml (S. aureus) to 16.67 mg/ml (Candida albicans). The ethyl acetate fraction showed bactericidal activity against all tested microorganisms.

**Conclusions**
Hence, ethyl acetate fraction of crude methanol extract exhibited the best antimicrobial activity.

## 328

## EFFICACY OF ACTIVATED CARBON FOR AMMONIA GAS REDUCTION IN SELECTED POULTRY FARMS IN IDO LOCAL GOVERNMENT AREA, IBADAN, OYO STATE, NIGERIA

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Ammonia, Activated Carbon, Emissions, Poultry

**Introduction**
Ammonia gas is one of the major pollutant gases which is toxic to living beings when inhaled in high doses. Previous studies have demonstrated an increase in ammonia emissions among poultry farms in Nigeria, but there is little information on ammonia gas emission reduction. Hence, this study utilized an activated carbon filter for the reduction of ammonia emissions in poultry farms.

**Methods**
The study adopted a quasi-experimental design and four poultry farms within the Ibadan metropolis (renamed A, B, C, and D) were purposively selected. Also, a fabricated glass chamber was used to monitor ammonia gas emission and reduction levels. Measurements of ammonia levels were carried out six days a week, three times daily for two weeks at specific periods of the day (8-11 am, 12-3 pm, and 4-7 pm) with a total sampling period of

eight weeks. Activated carbon from coconut shells and palm kernel shells was used as ammonia absorbent. Data were analyzed using descriptive statistics, T-test, and ANOVA at a 5% level of significance.

**Results**
The ammonia emissions (ppm); of 1150.67, 953.67, 1068.06, and 859.3 for farms A, B, C, and D, respectively were higher than the guideline limits for ammonia gas by NIOSH (25ppm) and OSHA (50ppm). Coconut shells-based activated carbon had a higher absorbency capacity with the average ammonia level reduced from 36.15±30.48 at baseline to 16.38±17.71 at post-treatment level and a percentage reduction of 19.77% while Palm Kernel shells-based activated carbon had 35.80±31.15 at baseline and 18.54±16.85 at post-treatment level, with a percentage reduction of 17.26% across all the poultry farms.

**Conclusions**
Activated carbon obtained from coconut shells had a greater absorbency potential for ammonia gas reduction when compared to palm kernel shells' activated carbon. Therefore, poultry managers should include activated carbon filters as a mechanism to reduce ammonia levels in poultry farms.

## 434

## The Network Pharmacology of Chlorogenic acid with special reference to anti cancer property

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
chlorogenic acid, network pharmacology, compound-gene network, bioactives

**Introduction**
Due to its remarkable and potent anti-cancerous impact, the use of Chlorogenic acid (CGA) in the treatment of cancer has received extensive reporting and demonstration in cell lines, preclinical tests, and clinical trials. Yet the metabolic mechanism of CGA on cancer remains obscure. Hence network pharmacology-based method was suggested in this study to address the problem

**Methods**
This study was based on the network pharmacology of CGA using information gathered from different databases and using the software Cytoscape. The networks detail the interaction of CGA with molecular targets, their pathways and their relation with diseases, particularly cancer.

**Results**
Network analysis determined 7 different targets concerning cancer in humans. Core genes in this network are AKR1B1, AKR1B10, HSP90AB1, METAP2, TRPC4, ELANE, and PRKCA. The types of cancers which are networked by CGA include pancreatic, prostate, breast, lung, colorectal, liver, and gastric cancers and tumors. AKR1B1 and AKR1B10 was shown to be involved in metabolic pathways involved in cancer

**Conclusions**
Network pharmacology is an effective computing tool to understand the intelligence behind traditional medicine through systematic data mining, information synthesis, and collating bioactive, targets, pathways, and the associated indications. Biological experiments are needed to verify these in silico results in the future

## 668

## Ad26.ZEBOV, MVA-BN-Filo Ebola vaccine regimen, last mile transportation in Africa: shock and vibration study results show no impact on product quality

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Africa; cold chain; last mile; transportation; Ad26.ZEBOV, MVA-BN-Filo; Ebola vaccine;

**Introduction**
Ensuring storage and transportation conditions is crucial for vaccines, as failure can result in potency loss or degradation, putting effectiveness and/or safety at risk. Ad26.ZEBOV, MVA-BN-Filo (Ad26, MVA) vaccine has demonstrated safety and immunogenicity in trials in Africa, where supply chain would benefit from shipments at 2–8°C for the "last-mile". Ad26, MVA stability has been extensively studied and long-term stability was demonstrated for several years at -85°C to -55°C, and short-term storage at the distributor at 2–8°C for <8 months (Ad26) and <1 month (MVA). This study, simulating rough road transport conditions at 2–8°C, was conducted to broaden the knowledge on shock and vibration impact to allow convenient cold chain conditions all the way to the end user.

**Methods**
A study was performed at 2–8°C, and according to distribution test sequence based on ISTA 4AB (100km rough road truck) to determine the impact of shock and vibration hazards on Ad26, MVA vaccine quality. Several critical quality attributes (CQAs) have been analysed: appearance, potency, virus particles, aggregation, and impurities.

**Results**
Comparison of CQAs showed no significant differences between control and samples undergoing transport simulation at 2-8°C on 100km rough road truck.

Appearance of Ad26, MVA, potency of Ad26 (infectious units by QPA) and MVA (infectious units by FACS), virus quantity (VPqPCR for Ad26, Genomic quantification for MVA), aggregates and impurities have been compared between control and stressed material with no significant difference.

**Conclusions**
The study demonstrates that local transport at 2–8°C by road has no significant impact on assessed product quality compared to the control condition. This study shows that refrigerated transport is suitable for the African stringent cold chain. Further studies for other modalities of refrigerated transport are currently being conducted to further enhance flexibility in the supply chain.

## 1431

## Estimating vaccine manufacturing requirements to meet PAVM's 2040 objectives

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
vaccines, manufacturing, supply, continental strategy, simulation

**Introduction**
Africa is highly dependent on vaccine imports, mostly through international procurement mechanisms such as GAVI and UNICEF. Currently, Africa locally produces only ~1% of the doses it administers. The lack of independent production capacity leads to significant barriers to equitable vaccine supply and access, further exacerbated by supply chain disruptions seen during the COVID-19 pandemic. As a result, the Partnership for African Vaccines Manufacturing (PAVM) was launched by the African Union and the Africa Centres for Disease Control and Prevention to promote and coordinate efforts around local vaccine production.

Specifically, the PAVM aims to locally manufacture 60% of vaccines administered in Africa by 2040, both for routine and pandemic use.

**Methods**
To promote an effective continental strategy to boost local manufacturing, two maps were developed to assess existing gaps: 1) a Current State map (as of February 2022) of existing and planned vaccine manufacturing facilities in Africa, and 2) a Future State map of manufacturing requirements to meet PAVM's objectives. The Future State map presents a technical assessment of the minimum manufacturing resource requirements to meet PAVM's 2040 target demand across 15+ priority vaccines, based on data collected from industry experts. A model built in Anylogic (version 8.7.12) was used to run discrete-event simulations of each vaccine manufacturing network. This model is based on a "pull" system driven by demand, rather than the build-up and consumption of stocks ("push" system).

**Results**
Volume and staffing requirements are substantive; ~12,000 full time employees across 13 facilities are needed in the scenario presented. This highlights the necessary investments to scale-up capacities on the continent, as well as the need to account for broader considerations (e.g., changing demand projections, sustainable business models).

**Conclusions**
This project was a collaboration between PATH, the Coalition for Epidemic Preparedness Innovations (CEPI), KU Leuven, and members of the PAVM.

## Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

## Oral Presentation

### 16

### Risk factors for neonatal mortality in rural Iganga district, Eastern Uganda: A case-control study

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Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Risk factors, neonatal mortality, case-control study, rural Uganda

**Introduction**
Reducing neonatal mortality is one of the bottlenecks to realizing the United Nations global agenda of Sustainable Development Goal (SDG) 3, target 3 of 2, which aims at reducing the neonatal mortality rate to as low as 12 deaths per 1,000 live births by the year 2030. Whereas reducing neonatal mortality is vital in decreasing under-five mortality, both Uganda's infant and under-five mortality have significantly reduced over the last decade but neonatal mortality has stagnated; and the reasons to explain this trend are not clear. This study determined risk factors for neonatal mortality in rural Iganga district of Eastern Uganda.

**Methods**
A matched case-control study design was utilised for the period: August 2019 to January 2020. This study was conducted in Nakigo and Nakalama sub-counties of Iganga district, Eastern Uganda with an estimated population of 50,766 individuals. Cases (n=91) were neonates that died and controls (n=182) were live neonates at one month. Data on maternal, social demographic and neonatal variables were collected from mothers of

neonates at household level. Explanatory variables were tested at bivariate analysis to measure their association with neonatal mortality. Variables that attained statistical significance were considered for multivariable logistic regression analysis to establish their association with risk of neonatal mortality. Crude and adjusted Odds Ratios with 95% Confidence Interval was used to interprete findings of the bivariate and multivariate analysis respectively.

**Results**
Giving birth to five children or more (AOR=2.88, 95% CI=1.25-6.63); attending less than four antenatal care visits (AOR=2.27, 95% CI=1.14-5.54); and giving birth to twins ( AOR=6.30, 95% CI=1.24-32.0) were the risk factors for neonatal mortality while delivering from a health facility was protective (AOR=0.26, CI=0.12-0.56).

**Conclusions**
To reduce the risk of neonatal mortality, interventions targeting frequent antenatal care visits should be prioritised. During antenatal care, special attention should be given to women who are pregnant with twins.

## 534

## Multi-actor collaborations in PHC implementation: A social network analysis of Ghana's PHC strategy

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Social Network Analysis, Actor Networks, Actor, collaboration, Primary Health Care, Ghana

**Introduction**
Ghana introduced its PHC strategy, the community-based health planning and services (CHPS), to improve equity in access to basic health services through effective intersectoral collaborations. More than two decades of its implementation, the CHPS strategy continue to face implementation bottlenecks and constraints. Even though it is known that an important dynamic that influences policy implementation is the network of actors involved and the roles these networks play, there remains paucity of empirical evidence on how the prevailing collaborations among actors affect the CHPS implementation. This study explored the structure and strength of multi-actor collaborations and how these affect CHPS implementation in Ghana.

**Methods**
This was a cross-sectional study using a social network analysis (SNA) methodology and a qualitative approach. Data collection involved survey of the domain of collaboration (knowledge of other actors and degree of communication) at key interfaces (community health nurses, volunteers, community health committee members, sub-district, district, regional and national including development partners) involving 131 actors across eight districts and in-depth interviews with 54 key actors. Social network data were analysed using Gephi software version 0.9.2 while the qualitative data were analysed using inductive content analysis

**Results**
The social network analysis shows weak collaborations among actors involved in CHPS implementation in Ghana (network density < 10%). The degree of collaboration varies across the different districts (network density=0.05 to 0.09). The results revealed that critical actors including district assemblies, political leaders, development partners and community health volunteers are less involved in the CHPS implementation. The qualitative findings show the weak collaboration negatively affect the CHPS implementation

**Conclusions**
Contrary to the view that CHPS embraces systematic planning and collaboration with all stakeholders, the study found weak collaborations among actor networks. It offers insights on the need to strengthen cohesion and improve collaborative

relationships in addressing health disparities through PHC

## 865

## The effect of the Ebola Virus Disease Epidemic on Measles vaccination coverage in children aged below five years in the Democratic Republic of Congo: A systematic review and narrative synthesis, Munich 2021.

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Ebola Virus Disease (EVD) OR Ebola, Measles, Vaccination, Immunization, Measles Vaccination Coverage, Democratic Republic of Congo (DRC) OR Congo.

**Introduction**
In the wake of the 10th Ebola Virus Diseases (EVD) epidemic, in the Democratic Republic of Congo (DRC), between August 2018 to June 2020, childhood immunizations were disrupted, resulting in a significant increase in the number of non-EVD related deaths due to a decline in vaccination coverage, specifically in the case of measles. Through the estimated measles vaccination coverage in children under five and other underlying factors, it was aimed to assess the impact that this EVD epidemic had on measles vaccination programs. Due to lack of robust data, the evidence regarding the impact remains inconsistent at present.

**Methods**
A systematic search to identify eligible studies was conducted on PubMed, Web of Science, and organisation websites such as the WHO, GAVI, and UNICEF. A total of 6,413 unique citations were identified, of which 11 were eligible for further analysis. Based on pre-defined outcomes, the key findings from the studies were reported using a narrative summary.

**Results**
An adverse indirect effect of the 10th EVD epidemic was a decline in measles vaccination coverage, which led to an increase in the measles disease burden in DRC. The disruption of immunization programs may have indirectly exacerbated the world's largest measles outbreak in 2019. This outbreak resulted in 382,370 cases and 7,071 deaths, of which 74% of the cases and 90% of resultant deaths occurred in children under five years. The factors contributing to the decline of measles vaccine uptake included the fear of contracting Ebola at health facilities, civil conflict, diversion of resources to address Ebola epidemic, and sub-optimal vaccination coverage.

**Conclusions**
The 10th EVD epidemic disrupted measles vaccination programs in the DRC. To address such a challenge, during similar emergency events in future, it is crucial to reinforce routine and supplementary immunization activities to close gaps in immunity among children in high-risk areas.

## 1110

## Usability of a blood-based HIV self-testing kit in Zambia

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**Keywords**
HIV diagnostics, HIV self-testing, HIV blood-based testing, HIV testing

**Introduction**
HIV Self-Testing (HIVST) was introduced in Zambia in 2017 as an additional strategy to increase HIV

testing coverage. This resulted in increased uptake and frequency of testing across populations using oral-based HIVST kits. To further increase HIV testing coverage, the MOH sought to evaluate the blood-based HIV self-test (BBHIVST) kit for acceptability and usability in the target population.

**Methods**

A cross-sectional study was conducted in two health facilities conveniently selected based on their catchment's high HIV prevalence. Participants enrolled in the study were provided instructions on how to conduct the self-test, interpret the result and if needed a demonstration by a healthcare worker. Participants were provided with a Mylan HIV Self-Test kit which they were expected to administer on themselves. However, participants needed assistance (e.g., using the lancet) were assisted by the healthcare worker. A semi-structured questionnaire to gather data on the ease of use of the self-test was then administered.

**Results**

A total of 1,033 participants took part in the study, of which 575 (57.3%) were female. About 93.5% (966) of participants found the BBHIVST easy to use without assistance while 1.0% (10) needed to be assisted when using the test. Reasons reported for ease of use included the test being simple to administer; very convenient; produced test results faster; instructions were clear and had a less painful needle prick compared with other testing kits. Almost all clients (99.5%) attested that given another opportunity they would use the kit again.

**Conclusions**

The BBHIVST was found to be easy to use, providing hope for increased testing coverage as more options and opportunities are made available for people in need of HIV testing in the country. There is need to adopt an assisted testing approach in facilities and communities for clients that may have difficulty reading instructions or performing a needle prick.

## 1496

## Obstetric ultrasound services for antenatal care to increase the Coverage of the first ANC visit and to detect earlier pregnancy anomalies in Rwanda, 2022

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**Conference Track**

Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**

maternal deaths, ultrasound machine, antennal care

**Introduction**

The WHO statistics (Febr2018) reported that more than 303 000 women died during and following pregnancy and childbirth. Around 99% of maternal deaths occur in developing countries and most can be prevented. In Rwanda, the maternal mortality ratio was 203 deaths per 100,000 live births (RDHS-2019-20) and Health strategic plan 2018–24 aims at reducing the maternal mortality ratio to 126 per 100,000 live births. WHO (2016) recommends one ultrasound (US) scan before 24 weeks of gestation to estimate gestational age, to reduce inappropriate induction of labor, improve detection of fetal abnormalities and multiple pregnancies, and improve a woman's pregnancy experience.

Ministry of Health adopted the strategy and has started its implementation using a comprehensive package for effective use of ultrasound: supply of ultrasound machines, training of midwives and nurses, maintenance of medical equipment, community awareness, mentorship, and monitoring of key indicators

**Methods**
This is action research (AR) to evaluate the implementation of this new strategy in Barame project supported districts before to extend it to all Health centers (HC). Key indicators to assess the proper use, usefulness and expected changes were identified. Data will be collected through digital tool by the HC staff

**Results**
A total of 33 ultrasounds were provided during the first phase (2021) to Health Centers in of two districts, 66 providers trained and started using them immediately. 66 Healthcare providers (HCPs) and 7 managers at central level were trained on digital tool. Mentorship and consultative meetings between HCPs and mentors took place, identified challenges are being addressed

**Conclusions**
Implemented comprehensive package for Antenatal care and Ultrasound at HC level is expected to improve pregnancy outcomes and evidence will be used while scaling up the strategy

## Poster

### 15

### Non-financial incentives for retention of health extension workers in Somali Region of Ethiopia: A discrete choice experiment, October 2021

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
discrete choice experiment, non-financial, incentives, retention, health extension workers, universal health coverage

**Introduction**
The shortage of health workers in Africa particularly in rural areas is a major constraint to achieving universal health coverage. There is need for the right mix of interventions to motivate and retain health workers tailored to the specific socio-economic and health system context. The study evaluated non-financial incentive packages to retain health extension workers in Somali Region of Ethiopia

**Methods**
Study design: Discrete Choice Experiment(DCE) technique using a mix of qualitative and quantitative methods in sequential order.

Study setting: Three woredas( districts) of Gashamo, Kebridehar and Warder in Somali region of Ethiopia

Study population: Health extension workers(HEWs), health managers and policy makers Sample size and sampling methods:96 HEWs through multistage sampling techniques,3 health managers and 2 policy makers selected purposefully.

Data management and analysis: Key Informant Interviews and Focus Group Discussions conducted among health managers, policy makers and health extension workers respectively to determine the job attributes and levels. DCE questionnaires developed from the findings from the qualitative phase used to elicit information on preferences for attribute packages from health extension workers. Mixed logic regression modelling was used to determine the effect of different job attributes on the retention, while Preference Impact Measure (PIM) was used to determine the combinations of preferred incentive packages for retention.

**Results**
Opportunity for continued education ranked first, 1.009(0.655,1.36), p =0.000, followed by career advancement/opportunity for promotion, 0.321(0.107,0.534), p=0.003, then supportive management 0.234(-0.395, -0.073), p=0.004 in terms of impact on retention. The most preferred incentive package for retention using the PIM model was opportunities for continued education and availability of and access to amenities (running water, electricity, internet), which predicted a 77% retention rate if implemented.

**Conclusions**
The outcomes of this study are intended to assist the government to design evidence-based incentive systems and retention strategies for health extension workers.

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## Infection prevention and control preparedness in private healthcare facilities: key gaps and opportunities for infection prevention and control programs in Ghana

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Infection prevention and control, private sector, Healthcare associated infections, antimicrobial resistance, patient safety, public health emergencies, Ghana

**Introduction**
Globally, healthcare-associated infections (HAIs) pose a grave risk to patient safety and antimicrobial resistance. However, there is enough evidence that effective implementation of infection prevention and control (IPC) programs can significantly reduce the incidence of HAIs and is a critical pillar in the prevention and control of antimicrobial resistance. In this survey, we examined the implementation of IPC programs in selected private healthcare facilities (HCFs) in Ghana using the Infection Prevention and Control Assessment Framework (IPCAF) tool

**Methods**
This was a descriptive cross-sectional design among 13 private healthcare facilities in the Greater Accra Region, Ghana. The World Health Organization (WHO) IPCAF tool was used to collect data from the participating HCFs in July 2022. Data were analyzed using descriptive statistics and correlation.

**Results**
The overall IPCAF median score was 405, with an interquartile range of 120.0, corresponding to an intermediate IPC implementation level. Two of the HCFs achieved an "advanced level," five attained an "intermediate level," and another five fell into the "basic" category. Only one facility exhibited an "inadequate level". The HCFs excelled well in components measuring built environment (87.5/100), workload, staffing and bed occupancy (80/100), and IPC guidelines (77.5/100). Multimodal strategies, HAIs surveillance, and IPC program components were poorly implemented by the facilities. The correlation analysis showed that IPC program positively drives IPC guidelines, education and training, HAIs surveillance, and multimodal strategies.

**Conclusions**
IPC implementation in the private HCFs is generally at the intermediate level. Opportunities for IPC interventions were identified, particularly with regard to multimodal strategies, HAIs surveillance, and IPC program core components. In the era of emerging infectious diseases, financial and technical assistance are required to help the HCFs overcome the identified gaps in their efforts to implement IPC programs

## 196

## Nutrition Knowledge, Attitudes, Food Safety and Hygienic Practices of Street Food Vendors in the Tamale Metropolis of Ghana.

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Food safety and hygienic practice, Nutrition knowledge, Street food vendors

**Introduction**
Increasingly most people have their meals outside their homes and are vulnerable to illness caused by unsafe food. Unsafe food preparation and supply by vendors have made food safety a concern for public health. Tamale is a densely populated city in the northern part of Ghana and many food vendors abound. This study evaluated the nutrition knowledge, attitude, and food safety and hygienic practices of food vendors in the Tamale Metropolis of the Northern region, Ghana

**Methods**
An analytical cross-sectional study on nutrition knowledge, attitudes towards, and food safety and hygienic practices was conducted among 424 food vendors which were randomly selected and analysis with the aid of spss version 20.

**Results**
In all 83.5% were female food vendors, 47.2% had received training on food safety and 49.1% cooked their food on the site. The mean ± SD score for nutrition knowledge was 7.08 ± 1.75 in which majority of the respondents (68.6 %) knew foods that help fight disease and builds immunity. The mean ± SD food safety and hygienic practice score was 7.61 ± 2.66 with more than half of the respondents reportedly did not use hand gloves while preparing and serving food. Factors that were associated with food safety and hygienic practices of the street food vendors were level of education (beta = -0.36, $p < 0.001$), number of hours worked (beta = 0.15, $p = 0.002$), food hygiene and safety knowledge (beta = 0.21, $p = 0.002$), having a business certificate (beta = -0.15, $p = 0.004$), and having medical check-up (beta = 0.11, $p = 0.029$).

**Conclusions**
The food safety and hygienic practices of the street food vendors were generally unsafe and may constitute food safety risk to consumers. Improving the food safety and hygiene knowledge may be an important at improving the food safety and hygienic practices of street food vendors.

## 198

## The Role of Evidence-based Decision Making Towards Universal Health Coverage in Africa

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Universal health coverage, Health insurance, Evidence, Decision making, Sub-Saharan Africa

**Introduction**
Increasing the health insurance coverage at population level is one of the main tools to achieve universal health coverage (UHC) in Sub-Saharan Africa. Despite, community-based Health Insurance (CBHI) is expanding in most of Sub-Saharan African countries, population enrolment and membership renewal remains low. The purpose of this systematic review is to generate an evidence to support informed-decision making towards promoting uptake of CBHI in Sub-Saharan African countries as a key driver of universal health coverage.

**Methods**
We systematically searched for relevant studies from databases: PubMed, Scopus, CINAHL,

Psychinfo, ProQest, EMBASE, and Africa-Wide Information. The search strategy combined detailed terms related to: (i) CBHI, (ii) enrollment/renewal, and (iii) Sub-Saharan African countries. A narrative synthesis of findings was reported according to the PRISMA guidelines. The protocol for this systematic review was registered with PROSPERO (ref: CRD42020183959). The database search identified 4055 potential references from which 15 articles reporting on 17 studies met the eligibility criteria.

**Results**
The findings revealed that barriers to uptake of CBHI in Sub-Saharan Africa were multidimensional in nature. Lack of awareness about the importance of health insurance, socio-economic factors, health beliefs, lack of trust towards scheme management, poor quality of health services, perceived health status, and limited health benefit entitlements were reported as barriers that affect enrollments into CBHI and membership renewals. The methodological quality of studies included in this review has been found to be mostly suboptimal.

**Conclusions**
The overall findings of this systematic review identified major barriers of CBHI uptake in Sub-Saharan African countries which may help policymakers to make evidence informed decisions. Findings of this review also highlighted that further research with a robust methodological quality, depth and breadth is needed to help better understand the factors that limit CBHI uptake at individual, societal, and structural levels in Sub-Saharan Africa.

## 211

## Determinants of enrolment for a pilot community-based health insurance scheme in agro-pastoralist communities of Somali region, Ethiopia, April 2021.

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**Conference Track**
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**Keywords**
Health Insurance, Determinants, Enrollment, Agro-pastoral, Somali region, Ethiopia

**Introduction**
Community Based Health Insurance is a type of health insurance program that provides financial protection against the cost of illness and improving access to health care services for communities engaged in the informal sector.

Ethiopia launched the scheme in 2011 as part of the revised health care financing strategy to ensure universal health coverage and scaled up in agrarian part of the country except agro-pastoral regions. The scheme started in Somali region of Ethiopia in 2020. The aim was to assess determinants of enrollment for community-based health insurance among households in Aw-barre district—an agro-pastoral setting in Somali Region, Ethiopia.

**Methods**
Community based unmatched case control study using a mixed approach of quantitative and qualitative methods was conducted between March and April 2021 and the study participants were selected using multi-stage sampling technique. Interviewer administered questionnaire was applied for 214 participants (54 enrolled and 160 non-enrolled), while key informant interview and focus group discussions was used to collect the qualitative part. The quantitative data was analyzed using SPSS version 20 and thematic analysis was used for the qualitative data. Multivariable logistic regression was used to determine the determinants of enrollment for the community-based health insurance and statistical significance was set at p value of <5%.

**Results**
Awareness about CBHI scheme AOR=9.67(1.26,74.53), households' income AOR = 3.56(1.03, 12.30); and being a member of community-based solidarity groups AOR = 2.48(1.17, 5.26)) were the determinants for CBHI enrollment and reaffirmed by the qualitative findings.

**Conclusions**
Given the early stage of scheme in agro-pastoralist setting, enhancing sensitization of the community using various community platforms, promoting community-based solidarity associations, diligent targeting of the poor households would help increase enrolment for the scheme. Finally, the success of the rollout will ultimately be dependent on taking into the context into account.

## 220

## Vaccination Status and its Determinants among 12-23 Months in Ginnir District, South-eastern Ethiopia 2021. Cross-sectional Study

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Non-vaccinated, incomplete vaccination, 12-23 months, Ethiopia

**Introduction**
Nineteen per cent of children in Ethiopia were not vaccinated and 38% of them were not fully vaccinated in 2019. Achieving recommended vaccination coverage is challenging and the outbreak of vaccine-preventable disease (VPD) occurs in many parts of Ethiopia. Hence, this study aimed to investigate vaccination status and identify their determinants among 12-23-months age children in Ginnir district of East Bale Zone

**Methods**
A cross-sectional study was conducted in Ginnir district from April 25-June10/ 2021. After conducting a pallet survey in the selected ten kebeles, a sampling frame was prepared and 563 households with 12-23-months children were selected using computer-generated random numbers. The sample was proportionally allocated to the size of children 12-23 months in each kebele. An adopted interviewer-administered structured questionnaire was used to collect data. The dependent variable was nominated into non-vaccinated, incomplete and fully vaccinated by employing fully vaccinated as reference. Bivariate and multinomial logistic regression analysis was used to identify the determinants of vaccination status.

**Results**
Of the total, 142(26%) were incompletely vaccinated and 114(20%) were not vaccinated. Poor knowledge about vaccine-preventable disease (VPD) [AOR=2.61; 95% CI: 1.16-4.27], poor knowledge on vaccination schedule [AOR=4.63; 95%CI: 2.83-7.65], negative attitude towards vaccination [AOR=2.11; 95% CI: 1.26-3.52], and home delivery [AOR= 3.46; 95%CI; 1.27-9.40], were associated with incomplete vaccination. Poor knowledge about VPD, [AOR=2.30; 95% CI: 1.28-4.15], home delivery [AOR=6.85; 95%CI; 1.69-27.7], not attending postnatal [AOR=2.24; 95%CI: 1.18-4.25] and vaccination site inaccessibility [AOR=2.97; 95% CI: 1.33-6.71] were associated with non-vaccination.

**Conclusions**
Poor knowledge about VPD and vaccination schedule, negative attitude towards vaccination, not attending postnatal and vaccination site inaccessibility were found risk factors for vaccination status. Improving mothers' understanding of vaccines, VPD, vaccination schedules, and conducting scheduled vaccine outreach is recommended to achieve the recommended vaccination coverage of 85 per cent.

## 226

## Predictors of Healthcare providers' intention to provide sexual and reproductive health services for unmarried adolescents in Gamo Zone, Southern Ethiopia: Using the Theory of Planned Behavior approach

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**Keywords**
Intention, Sexual and Reproductive Health, Unmarried adolescents, Ethiopia

**Introduction**
A sexual and reproductive health service is one of the cornerstones of strategies to prevent sexual and reproductive health problems. In order to promote services for adolescents, it is imperative to understand health professionals' intentions. However, in the context of Ethiopia health professionals' intentions are not well explored. This study was conducted to gain an understanding of healthcare professionals' intentions to provide sexual and reproductive health services to unmarried adolescents in Gamo Zone, Southern Ethiopia.

**Methods**
Methods: cross-sectional study design supplemented with phenomenological study was conducted from March 15 to May 2, 2021. The data were collected using structured, pre-tested and self-administered questionnaires. Descriptive statistics were performed. Binary and multivariable logistic regression was performed to identify factors associated with outcome variable (Intention to provide sexual and reproductive health services). To supplement the finding of quantitative finding, we conducted qualitative study among purposively selected healthcare providers working in adolescent and youth sexual and reproductive health centers by assuming they are information-rich respondents had extensive knowledge about a particular behavior, experience, or phenomenon of interest.

**Results**
Results: The study showed that 37.52% (95% CI=32.8, 42.2) were intending to give sexual and reproductive health services to unmarried adolescents. Participants' subjective norm (SN) (AOR=2.25:95% CI=1.38, 3.64), attending sexual and reproductive health training (AOR=1.75:95% CI=1.06, 2.91), and ever participation in the provision of sexual and reproductive health services (AOR=1.69:95% CI=1.35, 2.89) were the factors that were positively associated with their healthcare providers intention.

**Conclusions**
Less than half of the participants were intending to give sexual and reproductive health services for unmarried adolescents. Therefore, Interventions targeted to improve intention need to take into account improving health care provider attitude, and build positive subjective norms and improve the confidence to control the preventive behaviors.

## 391

## Impact of the Intergrated Sample Transportation System on the Viral Load testing programme in Zimbabwe, 2020-2022

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**Keywords**
Transportation; Testing; Viral Load; Coverage

**Introduction**
Sample transportation is key in ensuring timely patient diagnosis through timeous transportation of samples from the collecting facility to the testing lab and results back to the facility. Suboptimal sample transportation systems results in failure of disease management programmes due to poor testing rates and suboptimal access to testing. Zimbabwe fully operationalised the intergrated sample transportation system (IST) in August 2021 to try and improve Viral load and Early Infant

Diagnosis (EID) testing coverage as we work towards achieving the UNAIDS 95 95 95 targets.

**Methods**
A retrospective analysis of the Zimbabwe IST programme since its inception was done. Desk review of IST reports and updates were done to collect data on programme performance. Key informant interviews with the programme managers were also conducted to get insight on lessons learnt and recommendations.

**Results**
The Zimbabwe MoHCC started working on the sample transportation programme in 2017 with a few districts under pilot and full saturation attained in 2022. There was an 81% increase in total number of samples transported since full operationalisation of IST. Pre and post analytical turn around time of viral load results reduced from an average of 20 days to 5 days. Rejection rates of viral load samples reduced from 5% to less than 1%. Viral load testing coverage increased from 44% in 2018 to 71% in 2021 due to the introduction of IST and electronic results returning mechanisms.

**Conclusions**
The intergrated sample transportation has proved to be a viable system in transporting biological samples and support disease programmes to achieve set targets. It is therefore recommended that the system be extended to other programmes like Anti-Microbial Resistance were a one health approach needs to be adopted and have samples from all sectors transported efficiently for the success of the programme.

## 419

## Adherence to national referral protocol among adult patients seen at the Emergency Department of Moi teaching and referral hospital (MTRH) Uasin Gishu, Eldoret, Kenya.

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Adherence, referral protocol(guidelines), health system, MTRH, referral letter

**Introduction**
In Kenya, there exist a national referral protocol of patients from primary to tertiary levels of the health system. This protocol requires clinical information about the patient, initial care, laboratory and radiological results, method of transportation and whether the patient was accompanied by health care professional (HCP) or family. This study aims to examine HCP adherence documenting components of this national referral protocol for adult patients seen at the Emergency Department of Moi Teaching and referral Hospital, Kenya.

**Methods**
A cross sectional study was done on adult patients arriving through documented referrals at the Emergency Department of this level 6 facility. An interviewer administered questionnaire was used on 333 respondents selected through a systematic sampling technique with an interval of 4.The quality of referral was assessed by the completeness of information on the components of the referral protocol. Data collection was on Epi Info 7.2.5, and analysis done using STATA 16.1.

**Results**
Among the 333 participants 54% were males and mean age was 45.8years, (SD=21.1). Among the referrals, 38.14% were from county, 21.02% from sub-county, 20.72% from private hospitals, and 10.51% from health centers. Prior to referral of 38.44%, a telephone call to the hospital referral line was received. Overall, only 12.01% of referrals were of good quality 28.53% of Clinical and 36.64% of paraclinical components were considered of good quality. Among the factors associated with good quality referral the Glasgow Coma Scale (GCS) was the most prominent, Odd Ratio (OR)= 2.09 95%CI (1.2 - 3.6), p=0.003, and clinical referral, OR= 2.1 95%CI;1.2 - 3.3), p=0.003

**Conclusions**
Strict adherence to this template would mean fewer referrals. Adhering to clinical and paraclinical components could increase referrals but may delay referral if lab and/or radiology turnaround time is long. Hence clinicians should be trained to have lower threshold of clinical deterioration that prompts referral.

## 452

## "In Fact, That's When I Stopped Using Contraception": Sexually Active Women's Experiences of Using Contraceptives in KwaZulu-Natal, South Africa, October 2021

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**Conference Track**
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**Keywords**
Women; experiences; contraceptive use; sexual behaviour; KwaZulu-Natal; South Africa

**Introduction**
Despite significant gains in improving women's uptake of contraceptives in the African region, the number of unplanned pregnancies and high HIV burden remain high in South Africa and KwaZulu-Natal in particular. This phenomenon prompted us to explore the sexually active women's experiences of using contraceptives in a setting plagued by high unplanned pregnancies and HIV burden in KwaZulu-Natal, South Africa.

**Methods**
In October 2021, we conducted an exploratory qualitative study at Umlazi Township in KwaZulu-Natal to understand how sexually active women experience the use of contraceptives. We generated data through face-to-face in-depth interviews with 15 women from four primary healthcare facilities. Participants were recruited using a combination of convenience and criterion-based sampling techniques and NVivo version 11 was used to facilitate thematic analysis by two researchers skilled in qualitative research.

**Results**
Study participants were aged 18 to 35 years, two-thirds of whom were in the age range of 18-24 years. We found women's experiences of unpleasant contraceptive side effects, such as prolonged or irregular menstrual periods, bleeding, weight gain, and/or severe pains, were deterrents to their consistent use. Some women completely discontinued preferred, yet considered unpleasant contraceptives or opted for a different contraceptive method altogether. Contraceptive stock outs and lack of counselling on the pros and cons of using contraceptive were also reported as key challenges affecting their consistent use.

**Conclusions**
Comprehensive educational programmes on various contraceptives, including the pros and cons for each, are anticipated to improve the consistent uptake, while empowering women to make informed decisions. Women should also have easy access to counselling services to address any concerns relating to contraceptives.

## 498

## Trends and Spatial Distribution of Neonatal Sepsis in Uganda, 2016-2020

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**Keywords**
Neonatal sepsis, Early-onset sepsis, Late-onset sepsis, Uganda

**Introduction**
In Uganda, sepsis is the third-leading cause of neonatal deaths. Neonatal sepsis can be early-onset sepsis (EOS), which occurs ≤7 days postpartum and is vertically transmitted from mother to newborn intrapartum, or late-onset sepsis (LOS), occurring at 8-28 days postpartum and is acquired from the hospital environment or community. We described trends and spatial distribution of neonatal sepsis.

**Methods**
We conducted a cross-sectional evaluation using routinely reported inpatient neonatal sepsis District Health Information System version 2 data from 2016-2020. We calculated incidence of EOS, LOS, and total sepsis per 1,000 live-births (LB) at national, regional (n=4), and district (n=136) levels. We used logistic regression to evaluate national and regional trends and demonstrated spatial distribution using choropleth maps.

**Results**
During 2016-2020, 95,983 cases were reported, of which 71,262 (74%) were EOS. Overall neonatal sepsis incidence was 17.4/1,000 live-births. EOS increased from 11.7 to 13.4/1,000 LB (average yearly increase of 3% ($p<0.001$)); LOS reduced from 5.7 to 4.3 /1,000 LB (average yearly decrease of 7% ($p<0.001$)). Incidence was highest at regional referral hospitals (68/1,000 LB) and lowest at Health Center IIs (1.3/1,000 LB). Regionally, total sepsis increased in Central (15.5 to 23.0/1,000 LB, $p<0.001$) and Northern regions (15.3 to 22.2/1,000 LB, $p<0.001$), but decreased in Western (23.7 to 17.0/ 1,000 LB, $p<0.001$) and Eastern (15.0 to 8.9/1,000, $p<0.001$) regions.

**Conclusions**
Increasing EOS incidence in Uganda suggests prevention and quality of care gaps for pregnant women. The heterogenous sepsis distribution requires deeper analysis by health authorities in highly burdened regions. Strengthening prevention in Central and Northern regions and in high-burden districts could reduce neonatal sepsis. Expanding strategies to increase uptake of safe newborn care practices and prevent neonatal sepsis, such as the use of community health worker home visits for mothers and newborns, could reduce incidence.

## 500

## Visitors accessing health care services and implications for free medical policy in Zanzibar.

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**Keywords**
Health Financing, Non-residents, Health Care, Zanzibar, Health Care Access

**Introduction**
In Zanzibar, healthcare services are fully subsidized by the government since 1964. Despite its good intentions, the quality of care is unsatisfactory which is partly the result of chronic underfunding in the system. In addition, the 'free' healthcare services are partly consumed by non-residents. This study aimed to understand the magnitude of non-residents (referred to as visitors) consumption of health care services in Zanzibar.

**Methods**
We conducted descriptive analyses on the facility healthcare utilization data. This was collected using the digital open IMIS system from all primary public health facilities in six districts of Zanzibar for services provided from June 2021 to July 2022. The patients' information was linked using a medical identification card, which contained a unique identifier for patients accessing health services at public facilities. Visitors' identification numbers had a code to differentiate them from residents.

**Results**
A total of 108,585 visits to the health facilities were reported, of which 3,475 (3.2%) were made by visitors. Services provided to visitors at primary care public facilities consumed 3% (TZS 50 million) of the government resources allocated for health care services to Zanzibaris. The costs of the visitors' overall consumption are equivalent to the costs of malaria tests in all health facilities during the survey period. The spending is also equal to the amount spent on the provision of medical services to all patients over 65 years and the amount to cover 13% of the total cost for children under five years.

**Conclusions**
The money currently spent on healthcare for visitors could also be spent on care for its residents. Zanzibar is currently reviewing its health finance strategy; this ongoing reform brings the opportunity to introduce the Visitors' Levy. This could be in the form of a Visitor's health insurance scheme, to maintain the subsidized healthcare for the Zanzibari.

## 524

## Factors influencing patients' satisfaction with HIV/AIDS care in private and public hospitals in the Tema Metropolis. May 2022

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
HIV/AIDS; Patient satisfaction; Hospital; Servqual model; Ghana.

**Introduction**
HIV/AIDS has no cure. Patient satisfaction is one of the outcome measures of patient care. HIV care has been decentralized to hospitals whilst patients' perception on the quality of services has been neglected.This study aims to determine factors influencing patients' satisfaction with HIV/AIDS care in public and private hospitals.

**Methods**
A cross-sectional study with 98 HIV/AIDS clients as respondents from a private and public hospital. Simple random sampling technique was employed to select the respondents from each hospital. Data was collected using the Patient Satisfaction Questionnaire (PSQ-18). The means and standard deviations for each item of the Patient Satisfaction Questionnaire (PSQ18) were calculated based on the participants chosen score on the rating scale. A linear regression model was run for the socio demographic factors and patient satisfaction being the dependent variable. A T-test analysis was run to compare the difference in the level of satisfaction using the means of item 3 and item 17.

**Results**
General satisfaction had a combined mean score of 55.5% and an averaged mean of 2.78 which is the least among the 7 dimensions of the PSQ 18. This indicates that most of the respondents were not generally satisfied with the care they received. Marital status, occupation, health insurance status and level of eeducationalwere significant with satisfaction. There was high satisfaction in the time spent with care provider and technical quality domains of the PSQ-18. Generally care receivers from private facilities were more satisfied.

**Conclusions**
Measuring patient satisfaction, determining the factors influencing patients' satisfaction and understanding them is essential in coming up with decisions to improve compliance of patients receiving HIV/AIDS care. Increasing HIV/AIDS care receivers level of satisfaction is very important to reducing the burden of accessing HIV/AIDS healthcare and the stigmatization that comes with the disease.

## 536

## Impact of Hospital accreditation on quality of healthcare services and patient safety as an accelerator to Universal Health Coverage: Experience from Rwanda

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Keywords: Hospital, Accreditation, Quality, Safety, Rwanda

**Introduction**
As nations commit to achieving Universal Health Coverage by 2030, the Rwanda Ministry of Health with the support of USAID established a hospital accreditation system to facilitate progressive quality improvement and patient safety towards achieving Universal Health Coverage. Quality measurement mechanisms were put in place to identify gaps through periodic external surveys. Strategies such as facilitation and continuous quality improvement are an integral part of the health system and have contributed to closing the gap. With support from USAID, a study was conducted to assess changes in public hospitals' compliance with quality and safety standards.

**Methods**
A longitudinal study was conducted in 2 referral and 8 district hospitals that achieved accreditation standard level 2 during the fiscal year 2021/2022. We considered the overall scores of 21 standards from accreditation survey findings for five consecutive years (2017-2022), that focus on quality and safety. Analysis was conducted using Stata 14.0.

**Results**
All hospitals had a significant improvement in compliance to the standards(Proportion >45%) in 2021 and 2022 and the improvement was statistically significant for 8 hospitals: Mugonero(Chi2 for trend: 34%, p=0.000), Muhororo(Chi2 for trend: 25%, p=0.000) Kabaya(Chi2 for trend: 22%, p=0.000), Kibuye(Chi2 for trend: 21%, p=0.000), Byumba(Chi2 for trend: 15%, p=0.000), Kigeme(Chi2 for trend: 14%, p=0.000), Rwinkwavu(Chi2 for trend: 13%, p=0.000), Kibagabaga(Chi2 for trend: 10%, p=0.000) while Kirehe (Chi2 for trend: 2%, p=0.180)and Ruhengeri(Chi2 for trend: 0.2%, p=0.891) had a small improvement.

**Conclusions**
Integration of quality and safety standards in the National accreditation program combined with periodical surveys and quality improvement technical assistance has significantly contributed to compliance to the hospital standards hence improving quality and patient safety. Strong leadership and commitment of hospital management and healthcare providers are necessary to create and sustain an organizational culture of quality and safety services.

## 571

## Diabetes – Tuberculosis care in Eswatini: a mixed-methods study of opportunities and recommendations for effective services integration, June 2022

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Diabetes mellitus, tuberculosis, non-communicable diseases, services integration, primary healthcare

**Introduction**
Diabetes mellitus (DM) is a known risk factor for tuberculosis (TB). The World Health Organisation recommends bidirectional screening and integrated care for patients with either condition. Eswatini is a high TB burden country with an increasing burden of DM. Available evidence estimates the prevalence of DM amongst TB patients in Eswatini at 6.5%, yet evidence on the provision of integrated TB-DM care is limited. Using a TB service viewpoint, this research describes the availability of basic services, equipment, and commodities for integrated DM services, best practices by healthcare workers, and opportunities for better integration of DM care.

**Methods**
We used a mixed methods design to describe DM care delivery for TB patients. Twenty-three purposively selected healthcare workers from 11 representative tuberculosis clinics were interviewed. Quantitative and qualitative analysis was done using NVivo12.

**Results**
Eighty-seven percent reported DM and TB care are integrated. Eighty-seven percent indicated they assess for blood pressure, 61% fasting/random blood glucose, 39% visual acuity, 26% hearing acuity, and 26% routine HbA1c. Also, 70%, 65%, 61%, 57%, and 48% of respondents stated they experienced stockouts of urinalysis strips, antihypertensive drugs, insulin, glucometer strips, and oral hypoglycaemics, respectively, in the previous six months. Four main themes emerged from the interviews – quality and current standards of care, best practices, opportunities, and recommendations to improve integrated services. Respondents surmised that standardized NCD – TB treatment algorithms to guide healthcare workers, patient education resources, indicators to track NCDs among TB patients, and training healthcare workers in NCD-TB care can optimize existing opportunities.

**Conclusions**
Integrating DM into TB care is suboptimal due to unstandardized implementation across health facilities due to varied patient and health system challenges. A systems improvement approach to integration would address standardization through policies, health information management systems, social behaviour change messaging and health worker capacity strengthening.

## 710

## Factors influencing completeness of the recommend package for first antenatal care visits in Rwanda

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**Keywords**
Antenatal care, universal health coverage, health systems, Rwanda

**Introduction**
Rwanda has made great progress in improving access to antenatal care (ANC) and reducing neonatal mortality. This study conducted by the USAID Ingobyi Activity, led by IntraHealth International, assessed the completeness of

delivering the recommended package of services for the first ANC visit and associated barriers and facilitators.

**Methods**
We conducted a facility-based mixed-methods study between January-March 2022. A two-stage cluster sampling was adopted; the first four districts were randomly selected. Then two health centers with high ANC attendance were purposively selected from each district. 2,242 records of new registrant women were extracted from ANC registers between October-December 2021. We used the Rwanda Ministry of Health ANC package checklist to measure completeness. Provision of ANC package was reported using frequencies and percentages. Thematic analysis was applied for qualitative interviews.

**Results**
Generally, 23% of women received more than 90% of the full ANC package, 76% received 50-89% of the package, and 1% received less than 50% of the package. Services provided during the first ANC visit included provision of iron supplements (95%), provision of tetanus vaccine (93%), and HIV testing (89%). However, 48% of women were not screened for malnutrition; 41% were not screened for anemia; 40% did not receive deworming tablets, and 40% were not screened for urinary tract infection. Most health care providers reported stockouts of reagents and high workload as barriers, while supervision and training were reported as facilitators to providing the recommended full ANC package.

**Conclusions**
Although Rwanda has improved ANC coverage over time, provision of the recommended ANC package to women attending their first ANC visit is uneven. A lack of health commodities and high workload are the major barriers to providing the recommended package. These shortcomings can be averted through proper financing, forecasting, and health workforce allocation.

## 780


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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa


**Keywords**
Expanded access to healthcare, Second-generation Health Posts, Universal Health Coverage


**Introduction**
SFH Rwanda works to address market failures in the public health space across the country and uses innovative approaches from the consumers' perspective to develop convenient, affordable, effective and sustainable solutions. Building on existing strong collaboration with the Ministry of SFH constructed and equipped over 197 health posts countrywide. Health posts serve as a link between community and health centers and have greatly contributed to reduced travel distance for populations thus easing access to essential healthcare services. Most of the country's health posts are standard First-Generation Health Posts that provide basic services. SFH Rwanda launched Second-Generation Health Posts in September 2019 with the aim of providing an expanded comprehensive package of essential services to communities.

**Methods**
We assessed the impact using SFH monthly data collected from Second Generation Health Posts in the period January 2020 to July 2022. Facility-based statistics combined with financial records were used to determine the health impact and cost effectiveness of Second-generation health posts.

**Results**
Our analysis of patient traffic indicates that the second-generation health posts increased access to affordable healthcare by at least five-fold, serving local residents who would have gone without treatment. They attract 63% more patients

compared to the First-Generation HPs and have made significant impacts in local communities compared to predecessor while operating as successful and self-sustaining businesses. Performance of Second-Generation Health Posts from January 2020 to July 2022.

Over 1,121,047 patients served: about 1,116 visits monthly/HP

1,325 babies safely delivered

13,760 Ante Natal Care Visits

13,760 new clients in Family Planning

439,338 respiratory infections treated (over 39% of other cases treated in HPs)

221,519 Intestinal parasites (Over 19% of the disease treated in HPs)

75,671 Malaria positive cases treated (7%)

**Conclusions**
Second-generation health posts are operating as successful, financially sustainable businesses, which is important to encourage scale up.

## 781

## Association between Clinical and Ultrasound diagnoses of Aetiologies of Vaginal bleeding in the first trimester of pregnancy

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
First trimester vaginal bleeding, Pregnant women, Clinical diagnoses, Ultrasound diagnoses, Cameroon

**Introduction**
In resource-limited settings, there is a heavy reliance on clinical presentation to establish the cause of first trimester vaginal bleeding (FTVB), due to the limited availability of ultrasounds (US) imaging. This study assessed the association between clinical and US diagnoses of FTVB in a population of Cameroonian pregnant women.

**Methods**
This was a cross sectional analysis of data obtained from 144 consecutively selected pregnant women with gestational age <14weeks, from two referral hospitals in the South-west region of Cameroon. The association between the clinical and US diagnoses of FTVB was assessed using Multivariable logistic regression, adjusting for potential confounders. The threshold for statistical significance was set at $p < 0.05$.

**Results**
Participants had a mean age group of 25-29 years and average gestational age of 8-10 weeks. The main causes of FTVB diagnosed with the US were threatened abortions (35.4%), incomplete abortion (13.9%), complete abortion (4.9%), missed abortion (2.8%), ectopic pregnancy (27.8%), molar pregnancy (1.4%) and pregnancy with fibroids (2.8%). A significant association was found between clinical and US diagnoses for: threatened abortion ($P<0.001$), incomplete abortion ($P=0.004$), complete abortion ($P<0.019$) and ectopic pregnancy ($P<0.001$). Cohen kappa analysis revealed a moderate agreement between clinical and US diagnoses for elective consultations ($k = 0.634$, $p < 0.001$) and week agreement for referrals ($k = 0.520$, $p < 0.001$). Sensitivity and specificity for the clinical diagnosis of FTVB were 73% and 68% respectively.

**Conclusions**
Despite the association between clinical and ultrasound diagnoses of FTVB, the degree of

agreement between the two remains average. The use of US imaging for the diagnosis of FTVB should therefore be encouraged.

## 802

## Knowledge, attitude, and practice of youth toward adolescent sexual reproductive health in Rwanda

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Youth, sexual reproductive health, universal health coverage, health systems, Rwanda

**Introduction**
In Rwanda, sexual and reproductive health (SRH) information is available at all health facilities. However, there is paucity of evidence on SRH-related knowledge, attitude, and practice (KAP) among adolescents. The USAID Ingobyi Activity, led by IntraHealth International, conducted a study assessing KAP of SRH among adolescents.

**Methods**
We used a concurrent mixed-method approach. The study was conducted in four districts (Nyagatare, Gicumbi, Nyabihu, and Huye) among adolescents aged 10-19 years. Quantitative data were collected from respondents through household surveys and qualitative data gathered using in-depth and focus group discussions. We used chi-square to test the association between variables and logistic regression analysis to determine factors influencing adolescent KAP. Thematic analysis was applied to interpret qualitative data from interviews and focus group discussions.

**Results**
Of 478 adolescents, 36% had good knowledge of SRH; 62% (N= 298) reported they had heard about SRH in the six months preceding the survey, with 92% (N=274) reporting they heard it either from school or on radio. 30% of adolescents often discussed SRH topics with their mothers, while only 7% discussed SRH topics with their fathers. Adolescents from Nyagatare, Gicumbi, and Huye districts had poor knowledge about SRH compared to those from Nyabihu (OR= 0.3 P<0.01, OR=0.4 P<0.01, OR= 0. 4, P<0.01, OR=0.5 P<0.02). Having a secondary education and discussion with peers were associated with high knowledge of SRH (OR=1.67, P<0.01, OR=1.96, P<0.01). Over 75% (N=365) of adolescents mentioned they had sought SRH services at health facilities. In qualitative interviews, adolescents mentioned they needed SRH services, but shame, fear, and lack of awareness hindered their access to these services.

**Conclusions**
Interventions to improve SRH among adolescents should focus on parent-adolescent communication, peer education, and availability of youth-friendly SRH services. We recommend further research to investigate low adolescent knowledge about SRH in some districts.

## 804

## Community-based screening and testing for tuberculosis and COVID-19 in Nelson Mandela Bay Metro in South Africa, October 2021 to May 2022

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Tuberculosis
Covid-19
Community
Integration

**Introduction**
The COVID-19 pandemic substantially impacted South Africa's tuberculosis (TB) response resulting in a 59% decline in TB testing and a 33% decline in TB diagnoses.

Integration of COVID-19 community testing with TB screening was proposed as a strategy to improve TB case detection and COVID-19 testing during the pandemic.

With support from FIND, we describe the experience of integrating screening and testing for COVID-19 and TB, to improve detection of both diseases and optimize the use of testing resources in community settings in Nelson Mandela Bay district (1.2 million population), South Africa.

**Methods**
The community-based intervention was implemented from October 2021 to May 2022 targeting COVID-19 and TB contacts at community level. A screening algorithm, recording tools, and standard operating procedures were developed for the intervention. Appointed community healthcare workers conducted door-to-door screening of contacts of COVID-19 patients and TB patients, as well as mass screening in hotspot areas. The sociodemographic and clinical characteristics of participants and detected cases were analysed by descriptive analysis.

**Results**
During the project, 25,347 individuals were screened for TB and COVID-19 symptoms using a standardized tool that captured both COVID-19 and TB symptoms. Subsequently, 15,909 participants (63%) were tested for COVID-19 using antigen-detecting rapid diagnostic tests (Ag-RDTs); sputum was collected for 1,109 (100%) TB presumptive individuals.

Of those tested, 1,669/15,909 (10%) tested positive for COVID-19 and 122/1,109 (10%) tested positive for TB, 98% of whom were started on TB treatment.

**Conclusions**
The project identified cases of TB and COVID-19 that were likely to be missed and demonstrated that an integrated testing approach works while maximizing resources. Since implementation of the services at community level, the district has adopted the tools utilized and continues to provide integrated screening at community level through the deployment of community healthcare workers and linkage to nearby primary healthcare clinics.

## 866

## STENGTHENING DATA USE TO IMPROVE STAFF ACCOUNTABILITY AND CONTINUUM OF CARE FOR ANTENATAL SERVICES IN TANZANIA

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Antenatal care, Continuum of care, Data use, Tanzania

**Introduction**
Antenatal Care (ANC) is vital for improving the well-being of pregnant women. First ANC visit recommended to be before 12 weeks. Tanzania's 2015–16 Demographic and Health Survey reported only 24% did their first visit during the first trimester. There are many causes contributing to the low rate of ANC bookings before 12 weeks, one of them is inadequate linkage of women with positive Urine Pregnancy Test (UPT+) results to ANC. President's Office Regional Administration and Local Government (PORALG) is receiving support from Data.FI project to scale up data use for improving staff accountability and ANC services at different levels of the health system. This study aimed to assess the effect of data use initiative to improve staff accountability and continuum of care for Antenatal services

**Methods**
This study used a non-controlled before-after convergent mixed-method study design, Quantitative data were gathered through routine Health information management systems (HMIS) through District Health Information System and Integrated Monitoring and Evaluation System. Through situation room approach, Data were reviewed by a team of experts in Dodoma city and Kinondoni Municipal councils, this was done to find cause and effect analysis, identifying and priotize change idea of selected indicators. Qualitative data analysed and causes contributing to low ANC visit and accountability performance were identified through focused group discussion between experts. Quantitative data were analysed through excel version 2021.

**Results**
The results showed the increase in the percentage of women attending their first ANC visits before 12 weeks from 55% to 71% by January 2022 after the intervention began and increased staff accountability reporting to work on time starting providing services earlier from 75% to 96% by December 2022.

**Conclusions**
Routine data review through situations rooms lead to improved staff accountability and increased linkage of UPT+ women to ANC services.

## 869

## Towards universal health coverage in Tanzania. Addressing inequity for emergency medical and surgical services. Current status and future projection

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Infrastructure, Primary health facilities (PHF), Safe surgery, Universal health coverage

**Introduction**
Infrastructure development and upgrading to support safe surgical services in primary health care facilities are essential in achieving Universal Health Coverage (UHC). This study aimed to understand the achievements made between 2019 and 2022 in public sector towards its efforts in improving PHF infrastructure. We assessed construction rates, geographic coverage, physical status of facilities, availability of emergency Obstetric Care (CEMONC) services and emergency medical services (EMD).

**Methods**
Data was collected from existing policy reports, Services Availability and Readiness Assessment tool, Health Facility Registry, implementation infrastructure reports from 26 regions and 184 districts (covering assessment of physical infrastructure, inventories for ambulances), emergency medical services (EMD) and Comprehensive Emergency Obstetric Care (CEMONC). Data were descriptively analyzed to understand the distribution of PHF and their status.

**Results**
This study showed achievements made in increasing the number of PHF from 5,072 reported in 2019 to 6,036 in September 2022. The number of PHFs providing CEmONC services has increased from 115 reported in 2019 to 421. Moreover, 60 Hospitals, 80 EMDs and 28 ICUs were constructed. The assessment also revealed a total of 1,227 dispensaries, 199 health centers, and 50 hospitals need moderate to major innovation to enable the provision of quality health services. The increase in PHF infrastructure is contributed by the use of a new model which has cut the cost for construction and rehabilitation. However, according to health policy in infrastructure development, a deficit of 6,058 dispensaries and 2,862 health centers is evident, causing inequity in access to primary health care services.

**Conclusions**
There is improvement in the status of PHF due to construction, upgrading and equipping of facilities

with safe surgery and diagnostic services. Since there is scarcity of resources for PHF development, there is a need to consider geographical distribution, population size and distance to the nearest PHF during construction of PHF.

## 888

## Expanding newborn screening services for sickle cell disease in 10 regions in Ghana: lessons learned 2020-2022

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**Keywords**
Sickle Cell Disease, newborn screening, health care workers, scale up, linkage to care, early diagnosis

**Introduction**
Sickle cell disease (SCD) is an inherited disorder of red blood cells. Approximately 2% of Ghanaian infants are born with SCD. Without treatment, up to 90% of infants with SCD may die before age five. However, early diagnosis through newborn screening (NBS) and timely linkage to care are effective interventions to reducing morbidity and mortality and should form the cornerstone of any universal health coverage program. Ghana's National NBS Programme, launched in 2010, was limited to two of Ghana's sixteen regions. However, between 2020-2022, consortia partners and government implemented a program to expand NBS across Ghana.

**Methods**
A landscape assessment was conducted across Ghana (96 facilities) to understand the current state of NBS. NBS was then expanded to 14 additional hospitals in 10 regions (out of 16) using a training-of-trainers model and selecting sites at or near SCD treatment clinics. A monitoring tool was developed to track program progress and challenges. Data on infants screened, laboratory results, and referrals were collected through a mobile application. Key stakeholders were interviewed to collect additional learnings.

**Results**
By March 2022, 85 health workers were trained as Master Trainers, who then trained 172 additional health workers. 16,499 infants received NBS, with 16,147 receiving results. Out of these, 273 (1.69%) infants were identified with presumptive SCD. Of these, 227 cases (83.2%) were successfully tracked to receive results, of which 140 cases were linked to care and treatment (61.7% of those successfully tracked and 51.2% of all presumptive cases identified).

**Conclusions**
In pursuit of universal health coverage, newborn screening for SCD can be effectively expanded to tertiary and secondary level facilities across geographies. To improve service coverage, future scale-up efforts should prioritize integrating NBS into routine care, improving access to treatment centres, enhanced follow-up of presumptive SCD infants, strengthening data systems, and efficient supply chain management.

## 987

## Using Workload Indicators of Staffing Need (WISN) Methodology to Improve Human Resources for Health Planning in Ethiopia

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**Keywords**
WISN, HRH Planning, Staffing Norms, Staffing Requirements, Workload Pressure, Increasing Recruitment of Health Workers

**Introduction**
Ensuring the availability of adequate health workers in the right place is paramount to strengthening health systems and achieving equitable and universal health coverage. However, planning the required number of health workers is a major challenge for many countries in Africa. The Ethiopian Ministry of Health with support from the World Health Organization and the USAID-funded Jhpiego-led Health Workforce Improvement Program (HWIP) used Workload Indicators of Staffing Need (WISN) methodology to determine staffing requirements and identify gaps in existing staffing norms.

**Methods**
The standard steps of the WISN methodology were followed including identifying health cadres, defining work load components and service standards and interpreting WISN results. Data were collected in January 2021 from purposively selected health facilities in 10 out of 12 regions of Ethiopia. Difference and ratio indicators were generated from the WISN software and used to interpret workload pressure, staffing shortage and surpluses.

**Results**
Analysis was done on data from 54 health facilities and seven core cadres including doctors, nurses, midwives, health officers, medical laboratory personnel, pharmacy professionals and anesthetists. WISN recommended 114,234 new positions and redeployment of 17,684 health workers. On average, health posts need one health officer, two midwives and one nurse in addition to the existing two HEWs. Health centers require 15 additional health professionals. Primary, general and tertiary hospitals demand additional 14, 25 and 63 health professionals, respectively. The budget implication of the additional staffing was estimated to be around 232 million US dollars per annum.

**Conclusions**
The WISN study showed that the existing fixed facility staffing norms is no longer fit for purpose. The findings were used to revise staffing standards, with a potential to increase workforce density by 38%. Several short, medium and long-term recommendations are made including redeployment of staff, standardization of health services and review of scope of practice.

## 995

## Implementing essential diagnostics-learning from essential medicines: A scoping review

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**Conference Track**
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**Keywords**
Essential In Vitro Diagnostic Lists, Essential Medical Lists, Essential Diagnostics, WHO Essential Lists, Africa, Scoping Review

**Introduction**
The World Health Organization (WHO) model list of Essential In vitro Diagnostic (EDL) introduced in 2018 complements the established Essential Medicines List (EML) and improves its impact on advancing universal health coverage and better health outcomes. We conducted a scoping review of the literature on the implementation of the WHO essential lists in Africa to inform the implementation of the recently introduced EDL.

**Methods**
We searched eight electronic databases for studies reporting on the implementation of the WHO EDL and EML in Africa. Two authors independently conducted study selection and data extraction, with disagreements resolved through discussion. We used the Supporting the Use of Research Evidence (SURE) framework to extract themes and synthesised findings using thematic content analysis. We used the Mixed Method Appraisal Tool (MMAT) version 2018 to assess the quality of included studies where applicable.

**Results**
We included 172 studies reporting on EDL and EML after screening 3,813 articles titles and abstracts and 1,545 full-text papers. Most (75%, n=129) included studies were purely quantitative in design comprising descriptive cross-sectional designs (60%, n=104), 15% (n=26) were purely qualitative, and 10% (n=17) had mixed-methods approaches. There were no qualitative or randomised experimental studies about EDL. The main barrier facing the EML and EDL was poorly equipped health facilities - including unavailability or stock-outs of essential in vitro diagnostics and medicines and inadequate infrastructure to deliver health services. Financial and non-financial incentives to health facilities and workers were key enablers to the implementation of the EML; however, their impact differed from one context to another. Fifty-six (33%) of the included studies were of high quality.

**Conclusions**
The EDL implementation at the national level can learn from health system interventions to improve the availability and supply of essential medicines, such as financial and non-financial incentives in different contexts.

## 996

## Impact of CPAP machines on neonatal survival in a teaching hospital in Rwanda

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Neonatal, Mortality, CPAP Machine, Teaching Hospital

**Introduction**
Background: The mortality rate on the NICU in 2019/20 was 23%, using neonatal admissions to NICU as a denominator. Until March 2022 there were no factory-made CPAP machines for use in neonates with respiratory difficulties. Improvised techniques were used. Following receipt of ten factory-made CPAP machines the neonatal mortality rate in the unit appeared to decrease. This study evaluates the impact of CPAP machines on neonatal survival in a teaching hospital in Rwanda.

**Methods**
Methods: Data was extracted from registers and patient files for all neonates admitted April to July 2021 (pre-CPAP) and April to July 2022 (post CPAP) who were eligible for CPAP. Independent variables included birthweight, gestation age, length of time on CPAP, only oral feeding. Comparison was made using multiple regression. Nurses were assessed in their knowledge and skills in use of CPAP machines using a checklist. Assessments were conducted by three external neonatal nurses three months after the initial training and receipt of the factory-made CPAP machines.

**Results**
Results: Among the neonates who received factory made CPAP three deaths were reported compared with ten in those supported by improvised CPAPS. The length of time on support reduced and the graduation to non-parental feeding also reduced in those receiving factory made CPAP compared with those on improvised support. Of nurses assessed all scored over 80% in the post training assessment.

**Conclusions**
Conclusion: Factor made CPAP machines, combined with training on their use to all nurses working in NICU, can substantially reduce neonatal mortality in the NICU of a teaching hospital in Rwanda.

## 1001

## Integrating human papilloma virus testing as a point-of care service using GeneXpert platforms: Findings and lessons from a Kenyan pilot study (2019-2020)

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Human papilloma virus, point-of-care, GeneXpert, cervical cancer, screening, pilot, Kenya

**Introduction**
In 2020, cervical cancer caused over 340,000 deaths globally and 3,000 in Kenya. Human papilloma virus (HPV) testing is the recommended primary screening test. However, HPV testing is not widely available in the public healthcare system in Kenya. We piloted a point of care (POC) HPV test to inform national roll-out.

**Methods**
Pilot implementation period was October 2019–December 2020, in nine health facilities across six counties. We utilized GeneXpert platforms used for TB and HIV diagnosis, for HPV screening. Visual inspection with acetic acid (VIA) was used for triage of HPV-positive women. Quality assurance (QA) was performed by the National Oncology Reference Laboratory. Screening coverage, HPV positivity, triage compliance, triage positivity and treatment compliance were assessed. Test agreement between local GeneXpert and central comparator hrHPV testing for a random set of specimens was calculated as overall concordance and kappa value. Nominal Group Technique (NGT) was used to identify implementation challenges and opportunities.

**Results**
Screening coverage was 27.0% (4500/16,666); 53.8% (2376/4500) were between 30-49 years of age. HPV positivity was 22.8% (1027/4500). Only 10% (105/1027) of HPV positive cases were triaged with VIA; 21% (22/105) tested VIA positive, and 73% (16/22) received treatment. Median HPV testing turnaround time (TAT) was 24 hours (IQR 2-48 hours). Invalid sample rate was 2.0% (91/4500). Concordance between GeneXpert and COBAS was 86.2% (kappa value=0.71). Of 1042 healthcare workers, only 5.6% (58/1042) were trained in cervical cancer screening and treatment, and only 69% (40/58) of those trained were stationed at service provision areas. Testing capacity was the main challenge, and community strategy the main opportunity.

**Conclusions**
HPV testing can be performed on GeneXpert as a near POC platform. However, triage compliance and testing TAT were sub-optimal. We recommend strengthening of screening-triage-treatment cascade and expansion of testing capacity, before adoption of GeneXpert-based HPV testing in Kenya.

## 1023

## Household expenditures in primary health care centers for children under 5 in Burkina Faso, Guinea, Mali and Niger, 2021/2022

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
West-Africa, children under-5, direct medical cost, IMCI, health expenditures

**Introduction**
Despite payment exemption policies (PEP) in Africa, the persistence of out-of-pocket payments exposes households to catastrophic health expenditures that exacerbate health social inequalities. We measured the costs incurred by households for the care of children <5 years of age for Integrated Management of Childhood Illness (IMCI) consultations at primary health centers (PHC) in West-Africa

**Methods**
The UNITAID-funded AIRE project is evaluating the implementation of the pulse oximeter integrated with IMCI in PSCs in four countries: Burkina Faso, Guinea, Mali, and Niger. PEP is full in Burkina Faso and Niger, and partial elsewhere. Children <5 years of age seen in IMCI consultation, classified as simple respiratory, moderate, or severe cases according to IMCI classification were included with parental consent in four PSCs per country: each month, 5 simple/moderate, and 5 severe cases were randomly selected per PSC for the cost study. Direct medical costs (DMC) of cases directly managed at the PSC level and not referred were measured from the household perspective.

**Results**
Among the 15,962 children included in the AIRE project from June 2021 to July 2022, 1,548 children were included in the cost study, including 1,320 children directly managed at the CSP level. The median age ranged from 15 months (Q1-Q3: 8-30) in Niger to 20 months (Q1-Q3: 9-36) in Mali. Overall, the median (Q1-Q3) MDC at PHC level in USD was 0 (0-1.6), 3.6 (1.8-5.7), 5.2 (3.1-7.9), and 7.9 (5.1-10.7) in Burkina Faso, Niger, Mali, and Guinea, respectively. According to the IMCI classification, the MDC for severe cases ranged from 0.7 (0-3.6) to 4.9 (2.3-7.6) in Burkina Faso and Niger and from 5.3 (0.9-9.5) to 8.5 (0-12.9) in Mali and Guinea.

**Conclusions**
With the exception of Burkina Faso, payments for DMC of IMCI care at PSC level remain heavy for families, despite the PEP in West-Africa.

## 1057

## Determinants of Chemotherapy Discontinuation in Ethiopia, May 2022

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
chemotherapy, discontinuation, breast cancer, determinants, Ethiopia

**Introduction**
Women are more likely to die of breast cancer than from any other type of cancer. Survival can be significantly improved through systemic treatment. Many African countries, however, have issues with access and availability of breast cancer treatment, and patients often do not complete the recommended chemotherapy regimen. This study aimed to determine the magnitude and determinants of chemotherapy discontinuation at selected hospitals.

**Methods**
In four Ethiopian referral hospitals, a nested case-control study was conducted. Using two-year data (2019-2020), the magnitude of chemotherapy discontinuation was assessed. In total, 400 patients were included (200 cases, 200 controls) to identify the determinants. Cases and controls were interviewed by phone. Multivariate logistic regression was used to assess the determinate factors. P-values less than 0.05 were considered significant.

**Results**
We reviewed 1740 non-metastatic breast cancer patients' charts, and 329 (18.9%) discontinued chemotherapy. Respondents' mean age was 45.14 (± 13.6) among cases and 45.65 (±12.6) among controls. It was found that stage of the disease

(AOR =2.6, CI: 1.47-4.66), financial constraint (AOR = 2.01, CI: 1.10-3.66), thought of wellness (AOR =6.9, CI: 3.95-12.00), expected side effects (AOR = 4.2, CI: 1.62-10.85), intolerability of the side effects (AOR = 2.15, CI: 1.24-3.73) and fear of dependency (AOR =2.1, CI: 1.25-3.28) were the independent predictors of chemotherapy discontinuation.

**Conclusions**
There was a nearly one-fifth discontinuation rate of chemotherapy. Health workers can address modifiable reasons for discontinuation. There is a need to adequately manage side effects efficiently. To ensure long-term benefit, physicians should closely monitor patients to explain the necessity of completing all chemotherapy cycles and to avoid ineffective attempts to stop the treatment. Additionally, more efforts should be made to subsidize the therapy so that it is more accessible and affordable.

## 1113

## Do survivors of sexual violence access timely and high-quality medical care in Kenya? Findings from a mixed methods study in 2022.

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Sexual violence, medical care, Kenya

**Introduction**
Do survivors of sexual violence access timely and high-quality medical care in Kenya?

Healthcare workers are positioned to serve as first responders in identification, care, and treatment of survivors of sexual gender-based violence (SGBV). In many settings, detailed data on quality and pathways of care provided to survivors is sparse, making it challenging to improve health systems responses.

**Methods**
In the context of a sexual and reproductive health and GBV program in Kenya, we used a mixed methods design to assess quality of SGBV services in all program-supported public and private health facilities, including dispensaries, health centres, and hospitals, in four purposively sampled study counties. Quantitative health facility assessments included provider interviews; direct observations of facility supplies and infrastructure; and structured chart reviews of SGBV cases documented in the previous 6-month-period. We also conducted semi-structured in-depth interviews with healthcare providers.

**Results**
Among 123 facilities included in preliminary analyses, availability of functional laboratory services ranged from almost half of dispensaries (47%, n=40/86) to 92% of hospitals (n=12/13). Few facilities stocked emergency contraceptive pills (15%, n=18/123). Eighty percent of facilities offered psychosocial support. PEP treatment for children was variably available ranging from 22% among dispensaries to 83% in hospitals. While 54% of facilities reported at least one staff attending an in-service GBV training in the past year, few (29%) had received GBV-related supervision in the last quarter. Thirty-six percent of facilities stocked post rape care forms, while 30% were currently documenting cases using the national sexual gender-based violence register.

**Conclusions**
Although all levels of the Kenyan health system, from dispensaries to hospitals, are expected to offer an essential package of SGBV services, we observed steep gradients in SGBV service readiness across levels of healthcare in four diverse settings. The study also highlighted low use of national facility-based documentation tools, which hinders monitoring SGBV care quality.

## 1214

## Improving vaccination defaulter tracking in Bungoma County, Kenya, in 2021-22

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Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
routine immunization, service delivery, defaulter tracking

**Introduction**
Defaulters are children who have missed scheduled vaccinations, leaving them and their communities vulnerable to vaccine-preventable diseases. A 2019 assessment by the Clinton Health Access Initiative (CHAI) found that 15% of infants default on their 9-month vaccinations. While 90% of surveyed facilities have a defaulter tracking (DT) system, there are no standardized tools or practices, leading to under-immunization of children.

**Methods**
To improve DT, CHAI piloted an intervention to strengthen links between health facilities (HF) and communities. The pilot was implemented in 35 HFs in Bungoma County between May 2021 and June 2022. Monthly defaulter tracking and awareness meetings between key community members and facility staff were implemented. Healthcare workers were trained to identify defaulters in the immunization register, and CHAI developed a standardized tool to facilitate and monitor DT meetings. Defaulter tracking indicators were assessed at baseline, endline and routinely monitored in between.

**Results**
Preliminary results suggest DT practices improved. The proportion of facilities using the permanent register to identify defaulters increased from midline (19%) to endline (100%), while engagement with community leaders increased from midline (67%) to endline (100%). The proportion of HFs conducting daily and weekly defaulter identification increased from 7.4% to 28.6%, and from 11.9% to 14.3%, respectively. As a result, DT effectiveness improved; between Q1-Q4 2020, the proportion vaccinated among defaulters identified ranged between 0-15%. By Q2 2022 roughly 75% (231/309) of defaulters identified were subsequently vaccinated. Among surveyed facility and community respondents, 100% agreed at endline they would like to continue community meetings. However, 43% of respondent do not think they can financially sustain them.

**Conclusions**
This pilot underscores the importance of effective DT tools and practices, supplemented by structured community engagement. Preliminary results have informed a technical working group to standardize DT in Kenya. Further investigation is needed to ensure sustainability and scalability of this approach.

## 1454

## Measuring the Fidelity of Implementation and Moderating Factors of Direct Health Facility Financing Among Primary Health Care Workers in Tanzania: A Mixed Methods Process Evaluation Study

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**Keywords**
Fidelity, Implementation, Direct Health Facility Financing, Tanzania

**Introduction**
Direct Health Facility Financing (DHFF) initiative was introduced in 2017/2018 to bring more autonomy to the lower public primary health facilities by managing funds. Evaluation efforts of complex health financing interventions barely assess fidelity of implementation. Fidelity of implementation (FOI) means the degree to which an intervention is delivered as intended. This study aimed to measure the FOI of the DHFF initiative and the moderating factors in public primary health facilities in Tanzania.

**Methods**
We employed a mixed methods study design to collect and analyse qualitative and quantitative information. Four stages stratified sampling technique was used to select a quantitative sample of 238 health care workers using a structured questionnaire to collect quantitative data. In contrast, a semi-structured guide to collect qualitative data from 14 in-depth interviews. Association between FOI and its moderators was determined using Multiple Logistic regression analysis, whereas a thematic analysis approach was employed for qualitative data

**Results**
Only 28% of the study participants reported high FOI. Health care workers holding managerial roles had three times higher FOI levels than others (AOR = 2.973, p=0.0037). Adequate knowledge of the DHFF initiative had a five times chance of high FOI (AOR=4.90, p=0.032). Qualitative findings showed that most study participants had a positive attitude toward DHFF.

**Conclusions**
The study demonstrates a low level of FOI of the DHFF initiative. Moderators such knowledge about the initiative, its operation, leadership and management capacities are highly needed by DHFF implementers to applaud the initiative.

## 1471

## Exemplars in Global Health: Stunting Reduction in Nigeria

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Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Stunting, height-for-age, children, determinants, child nutrition

**Introduction**
Stunting prevalence reflects a range of factors at the population level and is an indicator of maldevelopment. Empirical evidence about the drivers of stunting reduction in areas where much progress has been achieved could assist decision-makers from other areas in replicating comparable progress. This study examined drivers of stunting reduction in "exemplary" states of Nigeria and the risk factors linked with stunting in "opportunity" areas where progress has been more limited.

**Methods**
We used mixed-methods and analytical approach in this case study: systematic review of peer-reviewed and grey literature; analyses of Nigeria DHS and MICS datasets to describe subnational variation and wealth, education, gender, and other inequities in stunting over time, hierarchical linear regression and Oaxaca-Blinder Decomposition to determine relative contributions of drivers of change; and qualitative interviews and focus groups to understand stakeholder and community perspectives on drivers of stunting decline.

**Results**
Improvement in linear child growth over the past decade is evident in both the north and south of

Nigeria, driven largely by the same factors. Our modelling predicted 66% of the observed +0.25 increase in mean height-for-age z-score over time, with nearly 60% of the predicted increase associated with effects of and improvements in non-health sector factors: paternal (18%) and maternal education (27%), household wealth (9%), and household sanitation (3%). Malaria prevention was associated with an additional 29% of the predicted HAZ change. There was consensus among respondents about inadequate political commitment and financial support in Nigeria impeding stunting reduction. National stakeholders considered guidelines on exclusive breastfeeding in the workplace, MNCH, school feeding, and the SuNMaP programmes to have a direct and positive effect on child nutrition.

**Conclusions**
A multisectoral approach to stunting reduction in Nigeria appears to have been key, with progress having been driven by both health sector and, especially, non-health sector action.

## 1547

## Quality assessment of clinical practice guidelines in Kenya using the Appraisal of Guidelines for Research and Evaluation II tool, September 2022.

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**Keywords**
Clinical Practice Guidelines, Quality, AGREE II, Kenya.

**Introduction**
Background: Clinical practice guidelines (CPGs) play a significant role in informing clinical decision-making and improving the quality of health care. Kenya, a lower-middle income country, is faced with a high disease burden amidst a shortage of health workers. Well-developed and implemented CPGs are essential in enhancing quality healthcare.

Objective: To assess the quality of available and accessible national CPGs in Kenya using the Appraisal of Guidelines for Research and Evaluation II (AGREE II) tool

**Methods**
Methods: In this methodological review, we searched electronic databases and websites of the Kenyan Ministry of Health, professional associations and contacted the relevant experts in these organizations. Our focus was guidelines on maternal, neonatal, nutritional disorders, injuries, communicable and non-communicable diseases in Kenya. Three reviewers independently conducted study selection and data extraction. We conducted quality assessment using online English version of AGREE II tool. Results were analyzed using descriptive statistics

**Results**
Results We retrieved a total of 95 CPGs and 24 were included in the analysis. Under the six AGREE II domains: Scope and purpose mean was 61.75% (95% CI 54.19-69.31) with 7 guidelines scoring less than 50%. Under stakeholder involvement the mean was 45.25% (95% CI 40.01-50.49) with 16 CPGs scoring less than 50%. Rigour of development domain mean was 3% (95% CI 0.61-5.39) with no CPG scoring at least 50%. Clarity of presentation mean was 82.96% (95% CI 78.35-87.57) with all guidelines scoring above 50%. Applicability domain had a mean of 19.88% (95% CI 13.32-26.43) with 1 CPGs scoring above 50%. Under editorial independence no CPG scored above 50% with a mean of 6.92% (95% CI 3.47-10.37).

**Conclusions**
Conclusion Our findings suggest that the quality of CPGs in Kenya is low compared to international guidelines. Stakeholder involvement, rigour of development, applicability and editorial independence needs improvement during guideline development process in Kenya.

## 1595

## A systems approach to strengthening the prevention of hospital-acquired infections and antimicrobial resistance in neonates in Gaborone, Botswana

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**Keywords**
Hospital-acquired infections – Antimicrobial resistance – Neonatal health – Infection prevention and control – Health Systems – Implementation

**Introduction**
Hospital-acquired infections (HAI) are a major cause of morbidity and mortality in hospitalised neonates in sub-Saharan Africa and are increasingly resistant to first and second line antimicrobials. Conditions in many sub-Saharan African healthcare systems are creating the "perfect storm" for high rates of HAIs and antimicrobial resistance (AMR) as infection prevention and control (IPC) capacity and infrastructure has not kept pace with the rapid growth in demand for and complexity of healthcare services.

This qualitative study aims to strengthen the evidence base from the health systems and implementation perspectives on underpinning factors influencing sustained IPC for hospitalised neonates at Princess Marina Hospital (PMH), the largest public referral hospital in Gaborone, Botswana.

**Methods**
This study used a qualitative system dynamics (SD) approach, which engages key stakeholders and policy-makers in the process. Sixty-six semi-structured interviews were conducted with individuals across the broad spectrum of influence on IPC at PMH including clinicians, nurses, mothers, cleaning staff, and decision-makers. The interviews explored participants' views of, and experiences with the health system factors that influence how IPC measures are implemented in the neonatal unit at PMH.

**Results**
The qualitative SD methodology culminated in the development of a Causal Loop Diagram (CLD), which is a visual representation of how the different systems variables impacting IPC in the PMH neonatal unit are interrelated.

**Conclusions**
This study provides qualitative evidence for decision-makers on context-specific priorities, policy levers, and health systems intervention points to strengthen IPC policy and practice for hospitalised neonates in Botswana. The findings are currently informing the development of a targeted IPC intervention bundle. The SD process itself, involving healthcare workers and decision-makers, generated consensus-building on strategies for sustained quality of care and health system resilience for the growing health threat of AMR.

## 1604

## The intersectionality of women's experiences forced to undergo female genital mutilation in Ismailia, Egypt

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
sexual and reproductive health services, female genital mutilation, married women, SRH awareness programmes, universal health coverage, Egypt.

**Introduction**
Sexual and reproductive health (SRH) is a right that must be assured to all women worldwide to have a safe and healthy sex life. In Egypt, there are different political, cultural, and religious factors that have impacted the way society perceives and treats women's sexuality and bodies. Many women in Egypt are forced to undergo female genital mutilation (FGM) during their upbringing. It is difficult to provide solid data to guide policymakers and conduct health awareness programmes. This study was conducted in March 2020 and addressed this gap by investigating the intersecting factors that influence the practice of FGM and how these factors affect women's access to SRH services in Ismailia, Egypt.

**Methods**
The study used a qualitative research approach. Purposive and snowballing sampling techniques were utilized to conduct semi-structured interviews with twelve married women and two healthcare professionals in Ismailia, Egypt. The qualitative data analysis software, Atlas.ti, was used to analyze the data.

**Results**
The study revealed that all twelve married women in the study area were forced to undergo FGM due to a lack of access to SRH information and services, which negatively affected their sexuality. These women were influenced by intersecting factors such as cultural, socio-economic, religious, power structure, and the healthcare system. The study showed that religious norms and narrow interpretation of the religious scriptures limit an open discussion on such practice. Intersecting factors like patriarchy and power dimensions manifested how women lacked power over their bodies, sexualities, and decision-making regarding their SRH.

**Conclusions**
There is a need to design comprehensive programmes under universal health coverage (UHC) to provide community-based SRH services such as conducting awareness programmes about FGM risks and SRH in primary healthcare units. Collaborative and synergistic partnerships between the government and related stakeholders should be developed to provide safe SRH services in Egypt.

## 1651

## Integrating immunization with maternal and child health services to strengthen the birth dose platform in Cameroon: A feasibility assessment

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**Conference Track**
Track 3: Strengthening Health Systems for Equitable and Universal Health Coverage in Africa

**Keywords**
Immunization, Integration, Hepatitis B birth dose, Maternal and child care, Cameroon

**Introduction**
The hepatitis B birth dose vaccine (HepB BD) is 95% effective in preventing perinatal transmission when given within 24 hours of birth. To inform the introduction of HepB-BD in Cameroon, CHAI supported the EPI to assess the feasibility of improving the timeliness of current birth dose vaccines (BCG and OPV0) via integrating immunization into maternity and newborn care.

**Methods**
Mixed method research conducted in 15 facilities across the Adamawa, Center, and West regions of Cameroon. To integrate immunization into maternity and newborn care, facility specific workflows were developed (and staff capacitated on redesigned workflows), birth dose refresher

trainings conducted, and staff roles outlined. Quantitative data from 119 health care workers (HCW) surveys, and one-year retrospective immunization/birth registry extraction of 30 children (selected via systematic sampling) per site, was assessed at baseline, midline and endline. Qualitative data from in-depth interviews with 20 purposefully selected staff from six of the 15 pilot sites was analyzed thematically.

**Results**
A 47% and 46% absolute increase was recorded in the proportion of children receiving OPV0 and BCG within 24 hours of birth, respectively, between baseline and end line, with HCW galvanization, caregiver sensitization and vaccine accessibility highlighted as major success factors. Knowledge on the administration of OPV and BCG within 24 hours of birth improved from 89% and 98%, respectively, at baseline to 100% at endline. Awareness to administer BCG and OPV0 to clinically stable, low birth weight children saw a 59.6% and 48.6% absolute increase respectively, between baseline and end line. At end line, 25% maternity and 30% EPI staff reported challenges with birth dose vaccination, with increased workload, wastage concerns (particularly for BCG) and limited EPI–maternity collaboration identified as main challenges.

**Conclusions**
The timeliness of birth dose vaccines in Cameroon can be improved, by implementing facility-designed interventions integrating immunization into maternal and newborn care.

## Track 4: Women IN Health - from recipients to providers to leaders

## Oral

### 96

### Examining the gender imbalance in the National Community Health Assistant Program in Liberia: A qualitative analysis of policy and program implementation

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Community health workers, gender, gender equity, gender assessment, health workforce, health policy, Liberia, gender responsiveness

**Introduction**
Background: The Revised National Community Health Services Policy (2016-2021) (RNCHSP) and its program implementation, the Liberian National Community Health Assistant Program (NCHAP), exhibit a critical gender imbalance among the Community Health Assistants (CHAs) as only 17% are women (MOH, 2016).

**Methods**
Methods: This study was designed to assess the gender responsiveness of the RNCHSP and its program implementation in five counties across Liberia to identify opportunities to improve gender equity in the program. Using qualitative methods, 16 semi structured interviews were conducted with policymakers and 32 with CHAs, other members of the community health workforce and community members.

**Results**
Results: The study found that despite the Government of Liberia's intention to prioritise women in the recruitment and selection of CHAs, the planning and implementation of the RNCHSP were not gender responsive. While the role of community structures, such as Community Health Committees, in the nomination and selection of CHAs is central to community ownership of the program, unfavourable gender norms influenced women's nomination to become CHAs. Cultural,

social and religious perceptions and practices of gender created inequitable expectations that negatively influenced the recruitment of women CHAs. In particular, the education requirement for CHAs posed a significant barrier to women's nomination and selection as CHAs, due to disparities in access to education for girls in Liberia. The inequitable gender balance of CHAs has impacted the accessibility, acceptability, and affordability of community healthcare services, particularly among women.

**Conclusions**
Conclusion: Strengthening the gender responsiveness within the RNCHSP and its program implementation is key to fostering gender equity among the health workforce and strengthening a key pillar of the health system. Employing gender responsive policies and programs will likely increase the effectiveness of community healthcare services.

## 624

## Effects of text messaging intervention on sexual health knowledge, attitude and practices among sexually active in-school adolescent girls in Calabar, Nigeria

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Adolescent Girls, Educational Intervention, Sexual Health, Telephone Messaging

**Introduction**
Safe sexual practices remain key to leading healthy and productive lives. Among young people, in-school adolescent girls in developing countries constitute vulnerable subpopulation, due to suboptimal implementation of sexual and reproductive health (SRH) rights and paucity of interventions. Within the context of limited public health resources, there is increasing need for cost-effective SRH digital interventions. This study was aimed at assessing effects of mobile text message sexual educational intervention, on sexual health knowledge attitude and behavioral practices among sexually active adolescent girls in Calabar, Nigeria.

**Methods**
Quasi-experimental study design was used. The study was carried out in two public secondary schools, comprising group 1 (control) and group 2 (intervention) in Calabar, Nigeria. Randomly selected sexually active adolescent girls were the participants in this study. Intervention study group received sex educational text messages daily for three days, at off school hours. Baseline, immediate post-intervention and 12-week follow-up assessment of sexual health knowledge, attitude and behavioral practices was done, using structured questionnaire.

**Results**
One hundred and twenty (120) respondents were studied, with mean age of 17.3 ± 1.3 years. At baseline, there was no significant difference in mean total knowledge scores comparing groups 1 and 2 ($p>0.05$). Also, there was no significant difference in attitude and practice scores comparing the both groups ($p>0.05$). At immediate post-intervention, as well as 12-week follow-up, mean level of total knowledge score, and scores for each of the constructs, was significantly higher for group 2 compared with group 1 ($p<0.00$). However, at 12-week follow-up, compared with group 1, there was no significant difference in mean scores for attitude and practice ($p>0.05$).

**Conclusions**
Text messaging educational intervention, improves sexual health knowledge, but longer duration of exposure may be required, for attainment of sustainable positive sexual behavior change. Further studies in different school-based settings is recommended.

## 688

## VOIX ESSENTIELLES INITIATIVE IN SENEGAL, BURKINA FASO, AND COTE D'IVOIRE (2022):THE GENDER PERSPECTIVE IN HEALTH DECISION-MAKING PROCESSES

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Women, leadership, policy, advocacy, decision-making, organizations

**Introduction**
Historically, women and girls have been excluded from leadership positions and spaces. To be truly equitable, we must ensure that they are empowered and supported to play a role in the decision-making process that influence health policies and programs.

The objectives of Voix EssentiELLES, initiative from June 2021 to July 2022 were to enable the participation of women and girls in decision-making platforms for their health outcome, and reinforce the organizations' and their leaders capacities and skills to influence policies.

**Methods**
Thirty-five women and girls' civil society organizations (CSOs) in Burkina Faso, Cote d'Ivoire and Senegal were supported with small grants to enable them to participate and inform programs and policies around tuberculosis, malaria, HIV, gender-based violence and sexual and reproductive health in their countries. Through the project, Speak Up Africa, developed a training program, "Université de l'ExcELLEnce", that allowed these community-based organizations (CBO) and their leaders to reinforce their organizational, leadership, advocacy, and communications skills. Speak Up Africa worked to increase their engagement and inclusion into national coalitions, regional and international platforms.

**Results**
After 12 months, the results from the "Université of Excellence" evaluation revealed that 96.5% of the CBOs engaged are more efficient today thanks to Voix EssentiELLES. Also, the same percentage of survey participants found that the leadership and advocacy capacities of women and girl champions were strengthened. Additionally, fifteen roadmaps were developed to bring women into the health decision processes and 94.7% of the CBOs agreed that the roadmaps developed facilitated their involvement in decision-making spaces.

**Conclusions**
These results have brought the CBOs to gain in maturity and confidence to evolve to a position of leader in their respective communities. As stated by a grantee: "The training on financial management was really beneficial and I hope that we will have more, as it is a real need".

## 758

## Living Peace Intervention efficacy for domestic violence: A randomized controlled trial

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Domestic violence; mental disorders; social support; Living peace intervention; Eastern DRC.

**Introduction**
The Living Peace Intervention (LPint) aims to reduce domestic violence and subsequent psychosocial problems in the eastern DRC through a community-based semi-structured intervention of 15 sessions during 15 weeks with groups of up to 15

men who are perceived as being violent by community members. This study evaluated the effectiveness of LPint immediately after (endline 1) and one and a half year after the intervention (endline2) in terms of reduction of domestic violence as the main outcome variable. It also sought to assess whether reduction of psychopathology and improvement in psychosocial wellbeing, among other indicators of interest, mediated in this process.

**Methods**
Nine hundred men and their female partner from 60 selected villages in North and South Kivu were invited to partake in the Cluster Randomized Controlled Trial study. Preliminary analysis was performed using descriptive statistics (mean & standard deviation)

**Results**
The results showed a significant decrease of domestic violence, violence against children, anxiety, depression, PTSD symptoms, and substance abuse in the case group compared to the control group in both males and females. It was also found that during post-intervention, the level of mental wellbeing, perceived social support and general self-efficacy were substantially increased in participants from case group compared to those from control group in both males and females. Of interest, there were relatively few statistically significant differences observed between case and control immediately after the intervention (endline1); but many were observed at endline 2.

**Conclusions**
This suggests that LPint helps people to learn life strategies that help them turn around their lives over the long run. We, therefore, recommend LPint as an intervention that can successfully address domestic violence and its correlates in a humanitarian crisis setting.

## 828

## Creating a pipeline to educate a cadre of women as health care leaders and providers at the University of Global Health Equity.

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Physician training Gender-conscious Admissions Policy

**Introduction**
The University of Global Health Equity (UGHE) has a mission to radically change the way health care is delivered across the world. In the admission of students for the physician training MBBS/MGHD program, UGHE prioritizes female applicants, ensuring that applicable Rwandan laws and policies are respected in the best interest of both the Rwandan community and gender equality policies. Within the context of social accountability in health professions education, it is important to examine the functioning of this gender-conscious admissions pipeline. This study seeks to determine gender differentials in the demand for the MBBS/MGHD program at UGHE over its first three years and to compare such demand with actual enrolment.

**Methods**
We reviewed applications data from 2019-2021 of the MBBS/MGHD program. Applicants and those enrolled were disaggregated by year of application and gender. The enrolment/application ratios were calculated for each year.

**Results**
Distribution of applicants and those enrolled by year and gender is shown in Table1:

| Year | Applicants | | Enrolment | | Enrolment/Applicant Ratio | |
|---|---|---|---|---|---|---|
| | Male | Female | Male | Female | Male | Female |
| 2019 | 415 | 270 | 10 | 20 | 1:41 | 1:13 |
| 2020 | 323 | 221 | 12 | 24 | 1:26 | 1:9 |
| 2021 | 720 | 439 | 13 | 29 | 1:55 | 1:15 |
| Totals | 1458 | 930 | 35 | 73 | 1:41 | 1:12 |

The gender-conscious admissions policy was able to achieve 67 percent admission of female students for the first two years and 70 percent with the most recent intake in 2021. The gap between demand and enrolment was seen more in 2021 with enrolment/applicant ratios ranging from 1:15 for females to 1:55 for males.

**Conclusions**
UGHE through affirmative action, is achieving the objective of creating a dedicated pipeline for training female physicians against the background of higher demand by males. Given the high gender disparity in enrolment/applicant ratios, the policy can be further interrogated by looking at differentials in the qualifications of applicants.

## 1187

## Transformative Leadership of health care workers in Nigeria, Liberia and the Democratic Republic of the Congo, champion woman's sexual reproductive health.

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
maternal mortality rates, health-seeking behavior, transformative development, leadership

**Introduction**
Despite considerable improvements in the maternal mortality rates, the lifetime risk of a woman in sub-Saharan Africa dying as a result of pregnancy and childbirth remains disturbingly high. Besides the social determinants, systemic and cultural factors, a woman's health-seeking behavior determines the outcome of her pregnancy. Leaders who champion women's sexual reproductive health issues significantly contribute to breaking these barriers.

This case-study presents the journey and contributions of transformative development and leadership of frontline MNCH-care providers who champion women's sexual and reproductive health in Liberia, Nigeria, and the DRC (East)

**Methods**
The study used an exploratory qualitative design that employed review of their capacity building, performance through the life of the MNCH program, professional development, and their evolved role influencing the scope, relevance, and responsiveness of the MNCH continuum of care model, and in-depth interviews with the community stakeholders, village heads and religious leaders.

**Results**
The review of these champions' role in our MNCH programs demonstrates significant evolution of the strategies and scope of MNCH-services, integrating livelihoods, nutrition, sexual gender-based violence, cognitive parenting, and enabling the communities.

The results revealed that through targeted capacity building and mentoring, these healthcare workers

acquired a combination of personal qualities of self-belief, confidence, self-management; setting direction, defining the future, and contextual astuteness to understand and address the emerging issues affecting women, families and communities; delivering services that are effective, in a way that is collaborative, inspiring and empowering to women and communities

**Conclusions**
This study evidenced the impact of the frontline MNCH-care worker-transformed-champions at multiple levels. The impact on women, children and the communities as manifested in increased uptake of MNCH services, and enhanced community participation. Their leadership competence as reflected in the evolution of MNCH program adaptation, integrating the issues that affect women disproportionately, including poverty, nutrition, and sexual gender-based violence.

## 1331

## Factors associated with modern contraceptive use among out of school adolescent girls in Kilimanjaro region, Tanzania

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Keywords: Modern contraceptive use; Contraceptive prevalence rate; Adolescents; Out of school adolescent girls; Factors; Tanzania.

**Introduction**
Adolescent pregnancy results in poor health and socio-economic consequences to adolescent mothers and negative impact to their babies born. Modern contraceptive use is an important intervention to decrease the burden of adolescent pregnancy which is highest in East Africa. Tanzania has 17th highest adolescent fertility rate in Africa with current fertility rate of 132 births per 1,000 girls aged 15-19 years. There is little information on factors associated with modern contraceptive use among out of school adolescents, who are at increased risk of adolescent pregnancies.

**Methods**
This was a cross-sectional study, conducted in Majengo and Njoro wards of Moshi Urban. Multistage sampling technique was applied, Moshi Urban was selected out of districts in Kilimanjaro region, Streets were randomly selected from two wards, households with adolescentes meeting the criteria were included. A total of 298 adolescent girls (10-19) years were interviewed. Data was collected using Kobo Collect TM. Data was cleaned and analyzed using SPSS v20. To determine the factors associated with modern contraceptive use, crude and adjusted analysis using logistic regression analysis was done.

**Results**
298 participants were enrolled with a median age of 19 years. The prevalence of ever use of modern contraceptives among 154 sexually active adolescents was 51%, while 78% were current users of the methods. Two common methods ever used were; 27.3% injectables and 3.2% male condom. Factors independently associated with ever use of modern contraceptive were; being married or cohabiting and having 2 or more sexual partners.

**Conclusions**
Ever use of modern contraceptives was higher (50.6%) than current use (35%). Marital status and number of sexual partners was associated with ever use of modern methods. Strengthening of adolescent friendly sexual reproductive health services outside facility setting is needed. Further, through intersectoral collaboration interventions to keep adolescents girls at school should be strengthened.

## 1507

## Characteristics, medical management and outcomes of survivors of sexual gender-based violence, Neno district, Malawi, September 2022.

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
SGBV, outcomes of SGBV survivors, characteristics of SGBV survivors, medical management

**Introduction**
Globally, 1 in 3 women experience physical or sexual violence, whereas in Malawi, the rate is higher (41%) among women aged 15-49. However, only a small proportion seek institutional help; 10% seek help from the Police Service, with 2% seeking help from health facilities. Following the implementation of a virtual one-stop center (from April 2020) which facilitates case management among sexual and gender-based violence (SGBV) support agencies in Neno, we reviewed SGBV records to determine the characteristics, medical management and outcomes of SGBV survivors presenting in health facilities in Neno, Malawi.

**Methods**
We conducted retrospective review of clinical records in SGBV registers in Neno District, Malawi for cases managed between March 2020 to March 2021. Data were collected from SGBV registers. We included information on demographics characteristics, nature of SGBV, medical evaluation and services provided during evaluation, and case return documenting legal process. R was used to generate frequencies and proportions.

**Results**
71 SGBV survivors were recorded in the registers during this period. 90% (n=64) were females and 57% (n=41) were below 18 years of age. The most prevalent form of abuse was Sexual assault (48%; n=34) followed by physical assault (46%; n=33). 8% (n=71) of total cases were re-visits. Services offered to survivors of sexual abuse were HIV testing (64.9%), screening for STIs (68%) and all eligible females were offered pregnancy test. 73% of survivors were offered psychological counselling, 70% were offered trauma counselling, and 89% were assisted by Police Services.

**Conclusions**
This study shows high rate of SGBV for females and young people especially sexual assault. Prevention and protection measures should specifically target this group of people. Though the coverage of interventions is high, there is still room to improve and offer help to all survivors of gender based violence.

# Poster

## 86

## Factors associated with non-adherence to folic acid and iron supplements among pregnant women attending antenatal clinic at Ilala district, Dar-es-Salaam from August to September 2020.

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Non-adherence – Folic acid – Iron supplements – Pregnant women

**Introduction**
At least half of anaemia burden is assumed to be due to iron deficiency with the rest due to

conditions such as folate, vitamin B12 or vitamin A deficiency. Member States have requested guidance from the World Health Organization (WHO) on the effectiveness and safety of daily iron and folic acid supplementation in pregnant women since they are at an increased risk of getting anemia compared to the general population as well as public health measure to improve pregnancy outcomes in support of their efforts to achieve the Millennium Development Goals.

**Methods**
This study was conducted in Ilala District. A cross sectional study design was employed and semi structured questionnaires were used to collect data from a study population of pregnant women attending antenatal clinic at Amana Regional Referral Hospital. Ethical clearance and consideration were observed.

**Results**
A total number of 300 pregnant women participated in this study; 66% had a low knowledge on the use of folic acid and iron supplements and 81% had low knowledge on the benefits of folic acid and iron supplements therapy. 76.7% reported not to use folic acid and iron supplements according to prescription and 23.3% were using the therapy appropriately.

**Conclusions**
The health care providers at the antenatal clinic at Amana Regional Referral Hospital ensure that all pregnant women who attend the clinic receive folic acids and iron supplements accordingly but most women do not adhere to their prescription. Most women had low level of knowledge on both the use and benefits of folic acid and iron supplements. Side effects of haematinics therapy are the common reason for non-adherence to the medication.

## 229

## Factors associated with acceptance of COVID-19 vaccination among women in Guinea: Investigation of the first vaccination round from March through August 2021.

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
COVID-19 vaccination, Women, Healthcare workers, General population, acceptance, Guinea.

**Introduction**
Vaccination remains the main strategy for ending the COVID-19 pandemic. However, vaccination rates are still low in low-income countries. The primary goal of this study was to describe the status of COVID-19 vaccine acceptance and hesitancy among women in Guinea and to identify associated predictors.

**Methods**
We conducted a cross-sectional study in five Guinean cities (Conakry, Mamou, Kindia, Kankan and N'zérékoré) across the four natural regions between 22 March and 25 August 2021. Participants aged 18 years were randomly recruited from the healthcare workers (HCWs) and the general population (GP). We used multivariate logistic regression to identify facilitators and barriers to acceptance of COVID-19 vaccination and a classification and regression tree (CART) to extract the profile of predictors.

**Results**
A total of 2,208 women were included among the HCWs and 1,121 in the GP. Most HCWs (63%) were already vaccinated, compared to only 28% of GP. The main factors associated with acceptance of a COVID-19 vaccine in the HCWs were an absence of pregnancy ORA = 4.46 [CI95%: 3.08, 6.52] and positive subjective norms ORA = 2.34 [CI95%: 1.92, 2.84]. Regarding the GP, the ability to receive the vaccine ORA = 5.20 [CI95%: 3.45, 8.01] and being adult ORA = 2.25 [CI95%: 1.34, 3.79] were the main factors associated with acceptance of vaccination.

**Conclusions**
Vaccination rates were higher in the HCWs. Favourable subjective norms and ability to receive the vaccine were facilitators of acceptance of COVID-19 vaccination, while youth and pregnancy were barriers to the approval of a COVID-19 vaccine.

## 303

## Improving Medical Abortion through mHealth in Malawi

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Abortion, Access, mHealth, Women, Technology

**Introduction**
Increased access to home-based medical abortion may offer women a convenient, safe and effective abortion method, reduce burdens on healthcare systems and support social distancing during the COVID-19 pandemic. Home-based medical abortion is defined as any abortion where mifepristone and misoprostol medications are taken at home by women. Outcomes include total time spent at a clinic appointment to receive EMA, self-reported preparedness for EMA, level of satisfaction with consultation and effective contraception uptake compared with when women attend for a face-to-face consultation.

**Methods**
There are no published randomised controlled trials (RCTs) on the use of telemedicine for EMA. Our proposed research was determined that hotline and phone was one of the most approach in delivering information for MA to women. Methods and analysis. This assessment conducted as an RCT. The recruitment target was 1320 participants. Successful abortion was the main outcome of interest. Risk ratios (RRs) and their 95% CIs were calculated. Estimates were calculated using a random-effects model. We used the Grading of Recommendations Assessment, Development and Evaluation approach to assess risk of bias by outcome and to evaluate the overall quality of the evidence.

**Results**
We identified 6277 potentially eligible published studies. Nineteen studies (3 RCTs and 16 NRSs) were included and women seeking abortion up to 9weeks gestation. Neither the RCTs nor the NRS found any difference between home-based and clinic-based administration of medical abortion in having a successful abortion. The certainty of the evidence for the three RCTs was downgraded from high to moderate by one level for high risk of bias.

**Conclusions**
Home-based medical abortion is effective, safe and acceptable to women. This evidence should be used to expand women's abortion options and ensure access to abortion for women during COVID-19 and beyond.

## 1188

## Maternal birth preparedness and complication readiness remains low in low- and middle-income countries: a systematic review and meta-analysis

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**Conference Track**
Track 4: Women IN Health - from recipients to providers to leaders

**Keywords**
Birth preparedness, Complication readiness, Low- and middle-income countries, Maternal & child health, Meta-analysis, Systematic review

**Introduction**
The global maternal mortality rate due to preventable pregnancy related complications is 810 per 100, 000 live births. Poor maternal involvement in birth preparedness and complications readiness (BPCR) practice contributes to poor maternal and child health outcomes in low- and middle-income countries (LMICs). This systematic review and meta-analysis determined the pooled prevalence of maternal BPCR in LMICs.

**Methods**
Literature were retrieved from CINAHL, EMBASE, Scopus, PubMed, and Web of Science databases. Egger's test and I2 statistics were used to assess the publication bias and heterogeneity. The publication bias and heterogeneity was validated using the Duval and Tweedie's nonparametric trim and fill analysis using the random-effect analysis. The summary prevalence and corresponding 95% confidence interval (CI) of BPCR was estimated using random effect model. The protocol were registered in PROSPERO code CRD42020213129. Recruitment of eligible studies were reported in PRISMA flow chart. The JBI quality assessment tool for prevalence studies was used. STATA Version 16.0 was used to conduct the pooled meta-analysis.

**Results**
A total of 44, 554 pregnant women and postpartum nursing mothers' were included. The pooled prevalence of maternal BPCR was 41%. Maternal arrangement of blood donor and knowledge of danger signs during pregnancy and postpartum period were 15% and 42% respectively. Only 42% of pregnant women arranged transport service to the health facility.

**Conclusions**
Lower maternal knowledge of dangers signs of pregnancy and postpartum complications, arrangement of transport service, and potential blood donor, contributed to lower birth preparedness and complication readiness in LMICs. Health systems must revise their health promotion policies and design evidence-based BPCR implementation strategy to enable active maternal involvement and improved community engagement. Point of care access to blood and transport service during pregnancy and postpartum period must be improved to achieve better maternal and child health outcomes.

## Oral

### 66

### Covid-19 vaccination profiles and the predictive factors of mortality of patients hospitalized for covid19 infection in the emergency department in Tunisia in 2022: a cross sectional study.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Covid 19, Vaccination, Predictive factors of mortality, Emergency department

**Introduction**
SARS-CoV-2 pneumonia is a serious emerging disease with a case fatality rate of 4% to 11%. It is therefore important to recognize high-risk patients early for better management and to study covid19 vaccines for better prevention. Our aim was to evaluate the epidemiological and covid-19 vaccination profiles of patients hospitalized for Sars-COV-2 infection and to identify the predictive factors of mortality among these patients.

**Methods**
We conducted a cross sectional study over a period of 4 months from January to April 2022 hospitalized in the emergency department of Tahar Sfar University Hospital.

**Results**
A total of 127 COVID-19 patients were included in the study, the sex ratio was 0.95. The average age was 67.07±14.5 years. In our sample, 64.5% were older than 65 years. The most frequently associated comorbidities were hypertension (39.4%), type 2 diabetes (37.8%) and a renal failure at the hemodialysis stage (17.3%). The Covid-19 vaccination rate was 47.2% of cases, 62.5% of them were vaccinated with m-RNA vaccine. About 72.4% of them survived (92) and 27.6% died (35). Compared with the 92 survivors, the deceased patients were significantly older (75.34 ± 9.43 years versus 63.92±14.88 years, $p < 0.001$). Among the dead patients, only 11 were anti-Covid vaccinated ($p= 0,043$). There was not a significant association between mortality and the number of vaccine doses($p=0.94$). This mortality rate was significantly related to the immunization status (OR= 0.105; IC 95%: 0.019-0.565; $p=0,008$), to putting the patient on a high-concentration mask on admission (OR= 4.527; IC 95%: 1.48-13.83; $p=0,02$), and to the presence of renal hemodialysis (OR= 1.08; IC 95%: 1.03-1.134; $p=0,009$).

**Conclusions**
Mortality rates differ depending on the vaccination status and other predictive factors. That's why it's mandatory to increase adoption of covid19 vaccine among high risk population.

### 99

### Evaluation of the concordance of COVID-19 diagnosis between nasopharyngeal and oropharyngeal swabs.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Nasopharyngeal, Oropharyngeal, SARS-CoV-2, COVID-19

**Introduction**
Nasopharyngeal swabbing (NASO) is a source of discomfort for the patient, which may discourage swabbing for COVID-19 testing and limit case detection. It is therefore necessary to consider alternative and more comfortable sampling. We therefore evaluate the concordance between nasopharyngeal and oropharyngeal (ORO) swabs for COVID-19 diagnosis in the Cameroonian context.

**Methods**
A comparative study was conducted in April 2021 in consenting participants tested for COVID-19 at the Chantal BIYA International Reference Centre (CIRCB) in Yaoundé-Cameroon. Nasopharyngeal and Oropharyngeal swabs were collected and analysed in parallel by Abbott real-time PCR for SARS-CoV-2. Statistical analyses were performed using Graph Pad version 6.0; P values <0.05 were considered statistically significant.

**Results**
A total of 154 participants were recruited, 92 males and 62 females, median age [IQR] 38 [30-49] years. After PCR testing, the overall positivity rate for COVID-19 was 36.36% (56/154); with 34.41% (53/154) in nasopharyngeal samples versus 16.23% (25/154) in oropharyngeal samples, p<0.0002. The overall concordance rate was 78%, with 39.28% positive concordance and 74.24% negative concordance. According to SARS-CoV-2 viremia, the positive concordance was higher in case of high viremia (TC≤ 25): 61% (11/18) versus 31% (11/35) in case of low viremia (TC> 25), p=0.037; OR=3.43. According to gender, the positive concordance was higher in men 55% (16/29) versus 25% (6/24) in women, p=0.021; OR=0.27. For clinical symptoms, the positive concordance was 40% (2/5) for symptomatic participants versus 42% (20/48) for asymptomatic participants, p=0.94. Using the NASO as the gold standard, the sensitivity of the ORO test was 41.50% (22/53), specificity 97.02% (98/101), PPV 88% (22/25), and NPV 76% (98/129).

**Conclusions**
These results suggest that, although oropharyngeal swabs are not a perfect alternative to nasopharyngeal swabs for SARS-CoV-2, their performance becomes more effective in cases of high-level (super-propagative) viremia. Thus, ORO swabs could be offered to patients with a contraindication to nasopharyngeal swabbing.

## 356

## Covid 19 in Temara-Skhirat: Observational study of prevalence in symptomatic young adults using the PANBIOS® rapid antigenic test

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Covid 19,rapid antigénique test panbios, prévalence, community, symptomatic

**Introduction**
Rapid diagnosis of SARS-CoV-2 infection is essential to reduce the spread of the disease. Rapid antigen tests have not been sufficiently evaluated in symptomatic patients to be used for mass

population screening.The aime was to estimate the prevalence of COVID-19 infection in Temara Skhirat in symptomatic young adults.

**Methods**
A prospective observational prevalence study was conducted at the Temara-Skhirat center for the year 2021-2022. Two investigators participated in data collection which included all symptomatic young adult patients referred after consultation of the doctor.The diagnostic validity of the PANBIOS test and the PCR was carried out with the JAMOVI software which made it possible to calculate the sensitivity and the specificity of the test. We carried out the medical decision.

**Results**
Among 206 symptomatic participants, the mean age was 38 ± 12 years and the majority were women 59%. Clinically, 80% of the population studied had benefited from the anti-covid vaccine. The median duration of symptoms was 4 days; the most common symptoms were respectively fatigue 62%, headache 52%, fever 48%, cough 34%, loss of smell 25%, loss of taste 24%, sore throat 22% and others (diarrhea, nausea )29%. The results revealed a rate of 23% of positive covid tests carried out with the rapid PANBIOS test vs 30% with the PCR test. The calculated medical decision between PCR vs PANBIOS rapid antigen test showed a very high specificity of 95.7% and a sensitivity of 69.4%. The results demonstrated that there was a statistically significant association between the PANBIOS rapid antigen test and the PCR with a $p < 0.001$.

**Conclusions**
The sensitivity and specificity of the PANBIOS vs PCR test are similar to those described in the literature. This study demonstrated that the rapid antigen test PANBIOS remains an indispensable tool in the early diagnosis of a community.

## 639

## The impact of Covid-19 on malaria services in three high endemic districts in Rwanda: a mixed-method study

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Malaria, Covid-19, Service delivery, Mixed-methods, Rwanda

**Introduction**
Rwanda has achieved impressive malaria morbidity and mortality reductions over the past two decades. However, the disruption of essential services due to the current Covid-19 pandemic can reverse these gains. Therefore, this study assessed the impact of Covid-19 on malaria services in Rwanda.

**Methods**
We conducted a mixed-methods study in three purposively selected districts in Rwanda. Quantitative data were health facilities and community malaria data, including the number of malaria tests, uncomplicated malaria cases, severe malaria cases, and malaria deaths. We collected qualitative data using focus group discussions with community members and community health workers and interviews with providers and malaria programme staff. We conducted an interrupted time series analysis to compare changes in malaria presentations between the pre-Covid-19 period (January 2019 to February 2020) and the Covid-19 period (from March 2020 to November 2020). The constant comparative method was used in qualitative thematic analysis.

**Results**
Compared to the pre-Covid-19 period, there was a monthly reduction in patients tested in health facilities of 4.32 per 1000 population and a monthly increase in patients tested in the community of 2.38 per 1000 population during the Covid-19 period.

There was no change in the overall presentation rate for uncomplicated malaria. However, the was a monthly reduction in the proportion of severe malaria of 5.47 per 100,000 malaria cases. Additionally, healthcare providers continued to provide malaria services. However, Covid-19 mitigation measures limited the availability of transportation options for the community to seek care in health facilities and delayed the implementation of some critical malaria interventions. The focus on Covid-19-related communication also reduced the amount of health information for other diseases provided to community members.

**Conclusions**
The Covid-19 pandemic resulted in patients increasingly seeking care in the community. Therefore, interventions should strengthen the community and home-based care models and integrate malaria messages into Covid-19-related communication.

## 1165

## Implementation of a Continental specimen referral network in Africa during the pandemic: Experience from pathogen genomics surveillance for SARS-CoV-2

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Pathogen genomics, SARS-CoV-2, Genomic Surveillance, public health

**Introduction**
The COVID-19 pandemic has demonstrated the importance of public health genomics for pathogen surveillance. SARS-CoV-2 genome sequencing has been instrumental in tracking the spread and monitoring the evolution of the virus, helping in the pandemic response. In Africa, most national public health institutions did not have genomic sequencing capabilities. Thus, to address the SARS-CoV-2 genomic surveillance needs, the Africa CDC developed a continental SARs-CoV-2 specimen referral system.

**Methods**
The Africa CDC through the Africa Pathogen Genomics Initiative and in collaboration with WHO-AFRO launched a continental specimen referral network for genomic surveillance of SARS-CoV-2. The network encompassed a combination of research institutions and labs designated as either national labs, regional hubs, or centers of excellence. Countries with limited genomic sequencing capabilities referred samples to these hubs/centers, while countries with in-country genomic sequencing capabilities sequenced SARS-CoV-2 specimens locally.

**Results**
A total of 33,000 specimens were referred with an average turn-around time of 3.5 days between the specimen collection site to the sequencing facility. 35 countries referred to SARS-CoV-2 samples while 14 countries conducted local sequencing. In collaboration with UK Health Security Agency, 80% of the regional hubs were enrolled in an External Quality Assurance scheme for molecular sequencing. A sample referral training curriculum was developed and 60 candidates were trained on sample packaging and shipment. Challenges including supply chain issues, material transfer agreements, custom procedures, and limited availability of dry ice and courier services were identified for future mitigation.

**Conclusions**
The Sample Referral network provided access to SARS-CoV-2 genomic surveillance capabilities to countries that had hitherto no infrastructure, enabling the identification of variants of concern on a continental scale. Continued genomic surveillance through this network is helping

mitigate COVID-19 in Africa. Plans are underway to optimize the network to facilitate genomic surveillance of other priority pathogens in a country and region-specific manner.

## 1621

## High exposure to SARS-CoV-2 in rural southern Mozambique after 4 waves of COVID-19: community based serosurveys

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, SARS-CoV-2, Mozambique, seroprevalence

**Introduction**
COVID-19 was declared as global pandemic by the WHO in March 2020, the same month, when the first case was reported in Mozambique. By September 2022, the country had seen four waves of COVID-19 with a cumulative of 230,180 positive cases and 2,222 deaths. We conducted a community-based serosurveys in the Manhiça district to assess the evolution of exposure after successive waves.

**Methods**
Four seroepidemiology surveys separated by ~3 months were conducted between May 2021 and June 2022. In each, 1,200 individuals residing in Manhiça were randomly selected from the Demographic Surveillance System, stratified equitably in four age groups (0-19, 20-39, 40-49, ≥60 years). Blood samples were collected and analyzed by commercial Elisa kit (Wantai) for detection of total antibodies.

**Results**
Overall 4,579 participants had a blood samples collected, of which 3,346 were tested. The prevalence of SARS-CoV-2 antibodies increased over the time from 27.6% (184/666) in serosurvey 1 to 63.6% (595/936) in 2 reaching 91.2% (700/768) and 91.3% (891/976), in the third and fourth serosurveys, respectively. Higher antibodies detection was observed among individuals aged 20-39 years 96.1% (173/180) in the serosurvey 3, and 40-59 years (94.5%; 258/273) in serosurvey 4. More than 88.8% (143/161) of individuals illegible for vaccination at the time of the study had SARS-CoV-2 antibodies detected in serosurvey 4. The partner of seroprevalence rates were related with the occurrence of COVID-19 waves.

**Conclusions**
Our data demonstrated universal exposure to SARS-CoV-2 of the general population residing in Manhiça District, southern Mozambique including individuals illegible for vaccination (younger than 18 years). These data may have implication to advocate strategies for vaccination

# Poster

## 45

## A critical review of web-based COVID-19 risk communication by religious authorities in Uganda, July 2020

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Religious authorities, Risk communication, COVID-19, Uganda

**Introduction**
Religious leaders are very respected and can influence their followers' practices towards reducing the spread of COVID-19. During the lockdown when physical meetings were banned, the internet was the most reliable means of communication with their congregation. The study explored the content of web-based communication on COVID-19 by religious authorities (RAs) in Uganda and their level of integration into the Ministry of Health and World Health Organization COVID-19 risk communication guidelines.

**Methods**
A grey literature review was conducted by searching the websites of intra- and inter-religious bodies licensed by the Uganda registration services bureau (URSB) for the terms "COVID-19" and "coronavirus". We included statements on COVID-19 in English published between December 2019 and June 2020 on the official RA letterhead or website. Statements from unrecognized RAs by URSB, and any third-party report on a RA COVID-19-related statement were excluded. The authority, accuracy, coverage, objective, date, and significance (AACODS) checklist was used to critically appraise the RA statements. Thematic analysis was used to assess the content of RA statements which were also mapped to the items of the MoH and WHO statements

**Results**
Fifteen RA websites with COVID-19 content were included. Most websites (9/15) released a series of statements. All RA statements were actionable (what to do or not to do) and in easily understandable plain English. RA communications were centered on COVID-19 description and management; the need to adhere to established guidelines and health-protective behaviors, notably, social distancing and avoiding misinformation. RAs also discussed the effects of COVID-19 and its control measures on the population and against pandemic-aggravated injustices (gender-based violence). The RA messages incorporated the WHO statement to a greater extent than the MoH statement.

**Conclusions**
RAs played a critical role in delivering public health messages during the COVID-19 pandemic. They should be maximized by health authorities for effective communication during emergencies.

## 84

## Effect of the Coronavirus Diseases Pandemic on the Management of Medical Emergencies at the Yaounde Emergency Centre, July 2021.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Medical emergencies, COVID-19, Yaoundé Emergency Centre, Rate of attendance, Rate of mortality

**Introduction**
The current coronavirus pandemic (COVID-19) has put the world into an unprecedented global crisis. Health systems have been faced with an enormous challenge to provide the necessary care for this vast burden of patients. As a result, emergency and scheduled care for non-COVID patients has been affected. Medical emergencies mostly affect the elderly due to the decrease in their metabolic activities and immune system response to pathologies. The objective of this study was to evaluate the effect of the COVID-19 pandemic on the rate of attendance and mortality in medical emergencies at the Yaoundé Emergency Centre.

**Methods**
This was an analytical cross-sectional study with an exhaustive sampling of all the patients received at the medical emergencies of the Yaoundé Emergency Centre from March to September 2019 and 2020. The data was collected using a review grid in registers. The database was created using Microsoft Excel 2016 and analysis done using Epi-info version 7.2.2.6.

**Results**
Data were collected from 5496 patients (3696 in 2019 and 1800 in 2020) in medical emergencies. COVID-19 pandemic has eventually decreased the rate of attendance in medical emergencies from 50.67% in 2019 to 46.26% in 2020 [Adjusted Odd Ratio=0.91, 95% Confidence Interval=0.76-0.91, P-value=<0,0001]. The rate of mortality was not impacted significantly even though it ranged from 7.95% (2019) against 15.85% (2020) [Adjusted Odd Ratio=1.06, 95% Confidence Interval=0.71-1.57, P-value=0,79]. In 2019, Cardiovascular diseases (CVDs) were the first cause of morbidity (21.62%) and Sepsis the first cause of mortality (26.19%) meanwhile in 2020, CVDs maintained the first cause of morbidity (21.44%) and strokes became the first cause of mortality (26.60%).

**Conclusions**
It emerges from this study that the COVID-19 pandemic has decreased the rate of attendance in medical emergencies but didn't affect significantly the rate of mortality.

## 235

## Reflecting on lessons learned from investigated COVID-19 clusters in congregate settings between 2020-2021, Limpopo Province, South Africa

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, Outbreak, Surveillance

**Introduction**
Disease surveillance is fundamental for rapid detection of infectious diseases to mitigate the spread in vulnerable settings and unfavourable outcomes. The National Institute of Communicable Diseases generates a daily COVID-19 line list that is accessed by the Health Departments to facilitate prompt disease surveillance and response activities. The surveillance team utilizes the daily line list to inform provincial response and identify outbreaks and activate outbreak response teams at the district level. Clusters are then investigated guided by the ten (10) steps of outbreak investigation and related guidelines depending on the setting of the event. This report intends to share lessons learned from investigated clusters to inform future outbreak investigation practices and operational guidelines.

**Methods**
We conducted a cross-sectional desktop review of COVID-19 clusters reports that were conducted in congregate settings between 2020-2021.

**Results**
Fifteen (15) cluster investigations were conducted in the province over 2 years. The majority of the identified clusters were investigated within 48 hours following notification. The lag between notification and initiating the investigations was affected by protocols in place that limits outbreak response teams immediate access. Common issues that facilitated the spread of disease were inherent operational practices; unregulated visiting practices; unavailability or poor implementation of infection and prevention and control (IPC) policies; inadequate occupational surveillance practices; and infrastructural challenges that inhibit effective social distancing and isolation. The institution's collaboration facilitated the response process and implementation of a measure that mitigated the spread and re-occurring outbreaks.

**Conclusions**
The review established that prevention and control of infectious diseases such as COVID-19 is complex and challenging in settings that houses many people. The development and implementation of tailored cluster management guidelines, infection prevention and control policies, disease prevention training, and modification of infrastructures that enable IPC practices is critical to control of COVID-19 outbreaks at a congregate and closed institutions is essential.

## 274

## Genomic sequencing of SARS-CoV-2 in Rwanda reveals the importance of incoming travelers on lineage diversity

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Genomics, SARS-CoV-2, Genetic Epidemiology, Phylogenetics

**Introduction**
COVID-19 transmission rates are often linked to locally circulating strains of SARS-CoV-2. Here we describe 203 SARS-CoV-2 whole genome sequences analyzed from strains circulating in Rwanda from May 2020 to February 2021. In particular, we report a shift in variant distribution towards the emerging sub-lineage A.23.1

**Methods**
Study design

In-depth study of SARS-CoV-2 strains that circulated in Rwanda from May 2020 to February 2021, in which we describe the demography and epidemiology of 203 SARS-CoV-2 genomes from collected SARS-CoV-2 positive oropharyngeal swabs

RNA Extraction

Ribonucleic acid (RNA) of the virus was extracted from confirmed SARS-CoV-2 positive clinical samples with Ct values ranging from 13.4 to 32.7

SARS-CoV-2 whole genome sequencing

Reverse transcription was performed. Samples were multiplexed and sequenced on a MinION

Phylogenetic and phylogeographic analysis

We downloaded all SARS-CoV-2 genomes from the available nextstrain build with Africa-focused subsampling and added Rwanda samples. We used the resulting alignment to estimate an unrooted maximum-likelihood phylogeny using IQ-TREE v2.1.226. We subsequently calibrated this phylogeny in time using TreeTime

**Results**
Most SARS-CoV-2 sequence diversity in Rwandan strains belong to two distinct lineages: A.23.1 and B.1.380. The latter dominated throughout the early stages of the pandemic before a shift towards the A.23.1 lineage occurred in November 2020.

**Conclusions**
Here we describe the pattern of transmission of SARS-CoV-2 in Rwanda from May 2020 to February 2021. In particular, we report the spread of A.23.1 with notable amino acid changes in the spike protein. Our results suggest that neighboring countries play an important role in establishing the circulation of (different strains of) SARS-CoV-2 in Rwanda. However, due to the unevenness in sampling across countries, with several not yet having provided any genomic sequences, additional data are required to accurately assess the effect of short-distance (e.g. crossing the borders with neighboring countries) versus long-distance travel in shaping the Rwandan epidemic.

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## Vaccine Hesitancy in Sub-Saharan Africa in the Context of COVID-19 Vaccination Exercise: A Systematic Review

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19 pandemic, Vaccines, Preparedness, Africa, Public Health

**Introduction**
Infectious diseases such as Influenza, Tetanus and Ebola have historical, geographical and socio-economic implications that have become easier to address through consistent vaccination strategies. During the COVID-19 pandemic, countries in sub-Saharan Africa (SSA) experienced vaccine inequity, but through the COVID-19 vaccines' global access, countries were able to acquire vaccines. However, as supply meets demand, vaccine hesitancy is becoming a defining theme of the pandemic as efforts to increase vaccine coverage are met with subsequent fall in vaccine uptake. Herd immunity acquired through vaccination is a collective moral duty. However, vaccination policies present tension at the intersection of individual rights and the common public good. Thus, this research explored vaccine hesitancy in sub-Saharan Africa in the context of the COVID-19 vaccination exercise.

**Methods**
Through a document search involving keywords "utilitarianism," and "COVID-19," and "vaccine hesitancy," and "sub-Saharan Africa, 67 publications were identified from PubMed, Scopus and Web of Science. The publications were screened by title and abstract to attain 43 articles. Out of the 43 papers, 28 articles were excluded for being duplicates, and 15 papers were screened by full text. Out of the 15 articles, nine were excluded for having information irrelevant to the main subject, and the remaining six were analyzed.

**Results**
Preliminary results indicate that vaccine hesitancy in SSA occurs against a backdrop of colonialism and inequities in global health research, social-cultural complexities, poor government response in debunking social and traditional media theories and poor community involvement in public health measures. All of which undermine public confidence that is crucial for sustaining collective immunity.

**Conclusions**
Vaccine hesitancy is a growing problem threatening vaccine uptake in SSA; thus, governments and other stakeholders need to enhance healthcare-citizen exchange that is not based on coercive health policies but on inclusive discussions.

## 315

## Social behavior, attitude, and perceptions towards COVID-19 vaccinations uptake, hesitancy, and acceptance among women: A cross-sectional case study in Somalia.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Covid-19 vaccine uptake, Barriers, Hesitancy, Multi-theory Model (MtM), Somalia.

**Introduction**
In Somalia, access to information, awareness, and availability of Covid-19 vaccines are key challenges. Somalia launched the Covid-19 vaccination in March 2021; however, the uptake of the vaccination is slow, which creates fear of further loss of life in Somalia unless organized campaigning and effort are made to improve both availabilities of the vaccine and acceptance by the community. This study aimed to understand the current level of awareness, accessibility, trust, and hesitance toward the Covid-19 vaccines among women in Somalia.

**Methods**
To assess Covid-19 vaccine uptake, acceptance, community awareness, and hesitancy rates in Somalia, we carried out a cross-sectional study in three regions of Somalia that were selected randomly out of the 18 regions of Somalia. Multi-theory Model (MTM) was developed to identify correlated factors associated with the hesitance or non-hesitance of Covid-19 vaccination among women of all ages.

**Results**
A total of 999 eligible women (333 in each district) aged between 15-98 years old were interviewed in March 2022. About two-thirds (63.76%) of participants reported hesitancy to receive the COVID-19 vaccine. About 34% of surveyed women indicated that they have low or no access to Covid-19 awareness information whereas 48% indicated having a moderate level of information. Multiple Theory Model initiation construct indicated that behavioral confidence in the vaccine ($b = 0.476$, $p<0.000$), participatory dialogue (at $b=0.136$, $p<0.004$), and changes in the physical environment ($b=0.248$, $p =0.015$) were significantly associated with Covid-19 vaccine acceptance among women who were not hesitant to take the vaccine.

**Conclusions**
The decision to get the vaccine was determined by multiple factors including the perceived value of the vaccination, previous experience with the vaccine, perceived risk of the infection, accessibility, affordability, and trust in the vaccine itself. Develop public health education programming and messaging to encourage vaccine uptake among women with varying levels of vaccine hesitancy.

## 421

## Risk factors associated with deaths among hospitalized pregnant women with COVID-19 in Uganda, June 2020 to August 2021

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, pregnant, death, risk factors

**Introduction**
Pregnant women are at higher risk than other COVID-19 patients for severe COVID-19 disease. Few studies have been done to understand risk factors for death among COVID-19-infected pregnant women in Africa. We investigated risk factors for death among hospitalized pregnant women with COVID-19 in Uganda.

**Methods**
We abstracted demographic and clinical characteristics from files of pregnant women admitted during any trimester with confirmed SARS-CoV-2 infection at eleven hospitals in Uganda. We conducted a case-control study. Cases were pregnant women hospitalized with COVID-19 who died during June 2020-August 2021, while controls were pregnant women hospitalized with COVID-19 who recovered and were discharged during the same period. We enrolled 33 cases and 109 controls. We analysed risk factors for death using multivariable logistic regression adjusted for age, trimester, parity, presence of comorbidities, and year of admission because these factors have previously been associated with COVID death or maternal death.

**Results**
Of 33 cases and 109 controls, 32 (97%) cases and 73 (67%) controls were hospitalised in 2021(p= 0.01). Among 31 case-patients and 105 controls with trimester data, 22 (70%) case-patients and 71 (68%) controls were in the third trimester of pregnancy (p=0.73). Thirty-two (97%) case-patients and 85 (78%) controls had symptoms of COVID-19 (p=0.04). Nineteen (58%) case-patients and nine (8%) controls had severe or critical COVID-19 disease at admission (p<0.001). Having severe or critical disease at admission (ORadj= 8.7, 95% CI: 1.2-61) increased the odds of death, while receipt of oxygen (ORadj=0.1, 95% CI: 0.01-0.5) and being hospitalised for more than 5 days (ORadj= 0.2, 95% CI: 0.1-0.6) reduced the odds of death.

**Conclusions**
Admission at severe disease stages increased odds of death for pregnant women hospitalized with COVID-19 in Uganda. Encouraging earlier admission and ensuring adequate oxygen supplies for pregnant women with COVID-19 could improve outcomes.

## 451

# Availability of essential medicines during the COVID-19 pandemic: A qualitative study examining experiences and level of preparedness in Kenya

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Availability, Essential Medicines, COVID-19, Preparedness, Kenya

**Introduction**
This study on the availability of essential medicine during and beyond COVID-19 sought to determine factors affecting access to essential medicines and technology; Assess health system capacity by identifying gaps that hinder the provision of essential medicines, and provide policy recommendations to improve country preparedness for future pandemics

**Methods**
A cross-sectional qualitative design was used. Participants were sampled purposively based on their experience in the health sector during COVID-19. A comprehensive review of grey and peer-reviewed literature on the impact of COVID-19 on essential medicines was carried out sequentially from the global, regional, and local contexts to better understand and explain the phenomenon. For the key informant interviews, we carried out 20 semi-structured interviews. These included representatives from; National government, Sub-national County government, Health professional bodies, Pharmaceutical manufacturers, NGOs and CSO representatives. Qualitative data from the interviews were transcribed verbatim, and an initial codebook and integrated emerging themes were analysed and presented using NVIVO software.

**Results**
The findings are categorized into six broad themes outlining the experiences, challenges, and opportunities in relation to the availability of essential medicines during the COVID-19 pandemic in Kenya. These include; (i) healthcare financing of essential medicines, (ii) supply chain and procurement system for essential medicines, (iii) regulatory policies and manufacturing capacity of essential medicines, (iv) human resource for health training on the production of essential medicines, (v) health information system on essential medicines, and (vi) the role of the public versus private sector in accessing essential medicines and promoting UHC

**Conclusions**
From the conclusions, several policy recommendations where action can be taken to promote and ensure the availability of essential medicines during novel times such as with the COVID-19 pandemic are put forward in areas like; Strengthening financial systems and policies of essential medicines and Increasing resilience of supply chain and procurement systems of essential medicines.

## 590

## Using wastewater-based epidemiology to track COVID-19 in rural settings within the Western Cape Province, South Africa,2021-2022.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
wastewater; surveillance; COVID-19; rural, public health

**Introduction**
In the current COVID-19 pandemic, wastewater-based epidemiology (WBE) has been used as a platform for SARS-CoV-2 surveillance and become an important public health strategy to combat the disease. These results have been used for temporal and spatial assessments that explore the amplitude of COVID-19 in rural district municipalities and continue to evaluate the impact of the pandemic in settings with limited testing.

**Methods**
On a weekly basis, raw influent wastewater grab samples were collected from eight wastewater treatment plants in the rural districts of the Western Cape from August 2021 to January 2022. Samples were transported to the laboratory and processed on the same day for the extraction of RNA, after which quantitative real-time polymerase chain reaction (qRT-PCR) was conducted.

**Results**
The SARS-CoV-2 RNA signal detected from inactivated viral fragments in the wastewater corresponded with COVID-19 cases and assisted in identifying COVID-19 hotspots and guide preparedness strategies. The uptick in wastewater trends and surge in COVID-19 cases during the 4th wave in the country within the selected rural municipalities can be associated with the mobility of populations following the closure of schools and traveling back to rural areas for the holiday season. The observed trends in RNA signal in wastewater also demonstrated that reliable wastewater surveillance can be applied within small and rural areas. Results were also released to municipal and provincial authorities and in key settings provided directly to strategic teams for informed decision-making to combat COVID-19.

**Conclusions**
The results emanating from this research have demonstrated the potential of wastewater surveillance in South Africa to track the COVID-19 pandemic as well as the circulating strain at the community level, which allows for a guided public health response. Beyond COVID-19, this wastewater surveillance also has the potential to track other infections disease outbreaks, illicit substances, and pollutants in water and wastewater sources.

## 634

## Effect of nationwide COVID-19 lockdown on timeliness in seeking treatment from Village Health Workers in Southwestern Uganda

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Village Health workers, Community Health Workers, COVID-19, Timeliness

**Introduction**
Village Health Workers (VHWs) in Uganda provide treatment for the childhood illness of malaria, diarrhea, and pneumonia through the integrated community case management (iCCM) strategy. Under this strategy a child under five years should receive treatment for these illnesses within 24 hours of onset of illness. In Uganda, following the first case of COVID in March 2020, a ban on public transportation and curfew were instituted nationwide. This study evaluated timeliness in seeking treatment from VHWs by children under five years with malaria, diarrhea and pneumonia in rural southwestern Uganda.

**Methods**
In September 2022, a database containing information from the VHWs patient registers over a period 6-month period was reviewed (01 December 2019 – 31 May 2020). The period 01 December 2019 to 22 March 2020 was categorized as pre-lockdown while the rest of the period was lockdown. A total of 4,024 child records drawn from 22 villages of Bugoye sub-county, Kasese district were included in the study. Timeliness was defined as a child seeking treatment from a VHW within 24 hours of onset of illness.

**Results**
Sixty-two (62%) and sixty-four percent (64%) of the children included in the study sought treatment timely, during the pre-lockdown and lockdown periods respectively (p=0.189). Children with fast breathing (53%) and fever (51%) had the highest proportions of seeking timely treatment, while those with diarrhea (30%) had the least proportion.

**Conclusions**
The findings suggest that the proportion of children that sought timely treatment during the COVID-19 lockdown was similar to that in the pre-lockdown period. This provides further evidence that care services through VHWs remain accessible even during periods of restricted mobility. The VHW led treatment strategy should therefore continually be supported as an option for accessible and timely health care, within rural communities.

## 682

## Predicting the effect of COVID-related international air border restriction policies on reducing daily viral incidence risk in Thailand, using mathematical modelling: May to June 2022

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, travel, policy, scenarios, SARS-CoV-2, importation

**Introduction**
The COVID-19 pandemic has spread widely and affected many sectors. Like many other countries

worldwide, Thailand has progressively lifted international border restriction policies to limit the spread of SARS-CoV-2. The underlying reason for the policy change is to aid the recovery of international air travel and tourism-related economic losses. Thailand's aim to mitigate these challenges necessitates estimating the associated risks of further COVID-19 outbreaks. Mathematical modelling is a viable analytical option to predict the effect of multiple scenarios of lifting restrictions on international air travel.

**Methods**
First, I conducted an extensive literature review and consulted policymakers at the Thai Ministry of Public Health to obtain evidence-based assumptions and model inputs. I then used a Susceptible-Exposed-Infectious-Recovered (SEIR) dynamic transmission compartmental model function embedded into a travel circuit model to simulate seven scenarios, in addition to a baseline scenario of no intervention. The scenarios included testing upon arrival, vaccine requirement only, vaccine requirement with testing upon arrival, 10-day quarantine only, vaccine requirement with 7-day quarantine, 10-day quarantine with tenth-day test-to-release, and vaccine requirement with 7-day quarantine and seventh-day test-to-release.

**Results**
The main findings of this research suggest that requiring all incoming travellers to be fully vaccinated, mandating a 7-day quarantine and testing them on the last day of quarantine is most effective at reducing the travel-related COVID-19 incidence risk in Thailand. The above-described effectiveness corresponds to a 91% reduction compared to no intervention. Comparing the effects of the scenarios shows that vaccine requirement increases the COVID-19 incidence risk reduction effect of testing travellers after their arrival in Thailand.

**Conclusions**
Given the evidence from the border restriction policy scenario simulations, policymakers can tailor the scenarios to specific situations. An accompanying economic analysis of the same border restriction scenarios would be instrumental in providing conclusions regarding the most cost-effective interventions.

## 683

## Impact of facilitating continued accessibility to cancer care during COVID-19 lockdown on perceived wellbeing of cancer patients at a rural cancer center in Rwanda.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Cancer, transportation, COVID-19, equity, access to care

**Introduction**
During COVID-19, the Butaro Cancer Center of Excellence (BCCOE), Rwanda sought to mitigate disruptions to cancer care by providing patients with free transportation to treatment sites and medication delivery at patients' local health facilities. We assessed the relationship between facilitated access to care and self-reported wellbeing outcomes.

**Methods**
This cross-sectional telephone survey included cancer patients receiving treatment at BCCOE at the start of COVID-19 pandemic. We used linear regression to compare six dimensions of quality of life (EORTC QLQ-C30), depression (PHQ-9), anxiety (GAD-7), and financial toxicity (COST) among patients who did and did not receive facilitated access to care. We also assessed access to cancer care and whether patient wellbeing and its association with facilitated access to care differed by socioeconomic status.

**Results**
Of 214 respondents, 34.6% received facilitated access to care. Facilitated patients were more likely to have breast cancer and be on chemotherapy treatment. Facilitation was significantly associated with more frequent in-person clinical encounters,

improved perceived quality of cancer care, and reduced transportation-related barriers to accessing care. Facilitated patients had significantly better general health status (β=9.14, 95% CI: 2.3, 16.0, p <0.01) and less financial toxicity (β=2.62, 95% CI: 0.2,5.0, p=0.03). However, over half of patients reported missing or delaying appointment. Patient wellbeing was low overall, and wellbeing differed by patient socioeconomic status, with poor-middle patients consistently showing worse outcomes. Further, facilitation did not lead to equitable wellbeing outcomes between richer and poor patients.

**Conclusions**
Facilitated access to care during COVID-19 was associated with some improvements in access to cancer care and patient wellbeing. However, cancer patients still experienced substantial disruptions to care and reported low overall levels of wellbeing, with socioeconomic disparities persisting despite facilitated access to care. Implementing more robust equity-minded care continuum facilitation and better patient outreach programs may strengthen patient care overall and effect better patients' outcomes.

## 737

## The hidden impact of the COVID-19 pandemic on childhood immunization in Cameroon, 2022.

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19 impact, childhood vaccination, Cameroon

**Introduction**
The third global pulse survey demonstrated that the abrupt and rapid progression of the COVID-19 pandemic had significant disruptions in childhood immunization in many countries. Although Cameroon has reported over 120,000 COVID-19 cases, the national childhood vaccination coverage during the pandemic seems to have increased compared to the pre-COVID-19 period. In fact, the DPT-1 coverage increased from 85.4% in 2019 to 87.7% in 2020, and DPT-3 increased from 79.5% in 2019 to 81.2% in 2020. The absence of literature on the impact of COVID-19 on childhood vaccination in COVID-19 hotspot Regions poses a challenge in developing a context-specific immunization recovery plan, hence the need to conduct this study.

**Methods**
We conducted a cross-sectional descriptive study using 2019 (pre-pandemic period) and 2020 (post-pandemic period) district childhood immunization data from the DHIS-2 database. Based on COVID-19 incidence, two hotspot Regions were selected, with all districts (56/56) included in the final analysis. The chi-square test helped to compare DPT-1 and DPT-3 coverages during the pre-pandemic and post-pandemic periods.

**Results**
The COVID-19 hotspot Regions reported a significant drop in childhood immunization coverages – 1.6% (P=3.73E-05) drop in DPT-1 and 3.8% (P= 3.32E-06) drop in DPT-3 in the Littoral Region and a 9.8% (P=1.64E-07) drop in DPT-1 and 11.4% (P=2.82E-09) drop in DPT-3 in the Centre Region. Most districts reported a point drop in childhood immunization indicators – 46% (11/24) of districts had reduced DPT-1 coverage, and 67% (16/24) reported reduced DPT-3 coverage in the Littoral Region. Meanwhile, 81% (26/32) and 84% (27/32) of districts in the Center Region had a drop in DPT-1 and DPT-3 coverages, respectively.

**Conclusions**
This study reported a situation where the national immunization indicators mask the impact of

COVID-19 on childhood immunization in heavily hit Regions. It, therefore, presents valuable information to inform policy on future pandemic preparedness and response.

## 742

## Utilization of Telehealth in Developmental-Behavioral Pediatrics Clinics at The University of Nebraska Medical Center.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Telehealth Utilization in Developmental-Behavioral Pediatrics

**Introduction**
The prevalence and complexity of children with developmental disabilities (DD) are increasing globally, despite the critical shortage of Developmental-Behavioral Pediatricians.

Telehealth may improve access to care and reduce the impact of transportation barriers. In the United States, Telehealth access rapidly expanded with the coronavirus pandemic.

The study aimed to examine completed and missed visits as a marker for improved healthcare access in Developmental-Behavioral Pediatrics (DBPeds) and assess disparities by demographics and diagnoses if present.

**Methods**
Retrospective chart review of electronic medical records (EMR) of completed and missed clinic visits of DBPeds patients seen in the clinic between March 2019 and March 2021.

We separated data for analyses into two groups using the periods before and after the pandemic's onset with telehealth's introduction. Patients were 0 – 21 years; each had at least one visit. Data collected included demographics (age, sex, race, ethnicity, insurance) and visit diagnoses.

We compared the number of visits between the two periods using one-sample two-sided t-tests. Analysis of variance determined if specific group factors were associated with differences in the number of visits during both periods.

**Results**
1030 patients' EMRs were reviewed; most had more than one visit.

1257 (65.58%) completed clinic visits before telehealth, 1615 (72.49%) completed clinic visits with telehealth.

660 (34.42%) missed visits before telehealth.

613 (27.51%) missed visits with telehealth.

Completed clinic visits during the post-pandemic period significantly increased ($p < .0001$)

No statistically significant difference in the number of missed visits ($p = .2557$).

Visits for ages 6 to 10 significantly increased compared to other age groups.

Visits for hyperactivity or Impulsivity significantly increased compared to other common diagnoses.

**Conclusions**
Access to care was maintained with telehealth. Given that DDs are one of the most prevalent disorders in the pediatric population and lacking providers, telehealth is a viable option for providing healthcare to this vulnerable population.

## 746

## Why Context matters: barriers to observance of COVID-19 preventive measures among rural communities, a case study of Wakiso District, Uganda

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
barriers, context, socioecological model, preventive measures

**Introduction**
Adherence to COVID-19 preventive measures can be influenced by various factors including the context within which they are implemented. This study aimed to explore the barriers to observance of COVID-19 preventive measures within a rural context in Wakiso district, Uganda.

**Methods**
This qualitative study conducted 7 Focus Group Discussions (FGDs) among 76 community health workers and 12 Key Informant Interviews (KIIs) among key stakeholders such as health workers, local chairpersons, and district health officials in Busiro South. Thematic data analysis was conducted with support from Nvivo (2020) and later identified sub-themes were grouped under 5 levels of the Socio-Ecological Model (SEM) as the conceptual framework.

**Results**
Individual factors identified included; low-income status, type of job, vaccine hesitancy, and complacency to observe COVID-19 guidelines. Under the interpersonal factors, a sub-theme on few or no COVID-19 deaths in communities was captured. For the level on community factors, sub-themes on community setup and poor communication on vaccine availability were captured. The organizational factors captured included the lack of trust and belief in the government and negative political influence on COVID-19 preventive measures. For the last level of the SEM on policy factors sub- themes on, conflicting COVID-19 preventive guidelines and corruption of law enforcing agencies were captured.

**Conclusions**
The identified barriers were not so different from the already documented challenges of uptake of health services in rural areas. The socio-ecological model allowed the researchers to group barriers for observance of COVID-19 preventive measures, thereby allowing for a more focused prevention, preparedness, and response at each level. Prioritization of identified barriers with consideration of the rural context should be considered when designing and implementing public health interventions to influence the uptake of preventive interventions for future pandemics.

## 759

## Challenges to Covid-19 Preparedness in Sub-Saharan Africa: Lessons Learnt from the SafeCare4Covid Project

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, Africa, digital tools, epidemic preparedness, quality improvement

**Introduction**
Background: Healthcare providers in low- and middle-income countries often struggle with patient safety and have limited data and insights on quality of care. This was evident during the COVID-19 pandemic, with many uncertainties regarding processes, treatment guidelines and equipment needed for managing COVID-19 patients. Information about the level of epidemic preparedness of African healthcare facilities is critical for policymakers to fight epidemics whilst maintaining essential healthcare services running.

**Methods**
Methods: SafeCare4Covid, a digital tool that supported healthcare workers in several African countries, was used to perform a gap analysis on healthcare facilities' supply and capabilities to handle COVID-19 patients, provide a tailored quality improvement plan and communicate practical COVID-19-information based on WHO standards and guidelines. A supply checklist assessed the availability of essential supplies to protect staff and patients. Additionally, capabilities regarding clinical, management and quality of care processes were assessed with focus on infection prevention measures, capacity building of staff and clinical management.

**Results**
Results: Between May–November 2020, 471 facilities in 11 African countries completed the capability assessment; 412 completed the supplies checklist. The average capability score was 58.0 (interquartile range 40.0–76.0), and the average supplies score was 61.6 (39.0–83.0). Facilities with the lowest preparedness scores were in rural areas, were of public ownership, and primary healthcare centers. Guidelines for triage and isolation, and for clinical management of COVID-19 patients were largely missing. Additionally, staff mental support, contact tracing forms, and isolation areas were lacking. 40% of facilities did not have N95/FFP2 respirators and 20% lacked medical masks.

**Conclusions**
Conclusions: A large proportion of mostly basic healthcare facilities lack fundamental epidemic preparedness capabilities and life-saving personal protective equipment. A system broad approach towards improving quality of care delivery, in which data-driven decisions on a network and policy level are stimulated are warranted to protect healthcare workers and patients alike.

## 774

## The Impact of COVID-19 Pandemic on Mental Health of African Students in Chinese Universities

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**Keywords**
African students; anxiety; COVID-19 pandemic; depression; mental well-being, perceived stress

**Introduction**
The COVID-19 Pandemic is associated with various stressors that deteriorate the population's mental health. Students are among the most vulnerable to low mental well-being (MWB) and psychological distress during the COVID-19 pandemic. International students face additional challenges such as cultural differences, language barriers, and homesickness, making them more prone to mental instability than their local peers. In 2018, China hosted 492,185 international students, among them 81,562 Africans. Therefore, this study aimed to assess the mental health status of African students in Chinese universities after two years of stress associated with the COVID-19 pandemic.

**Methods**
This cross-sectional study included African students in China. The questionnaire was built using

Wenjuan WeChat Survey. Warwick-Edinburgh Mental Well-Being Scale (WEMWBS-14), Perceived Stress Scale (PSS-10), Patient Health Questionnaire (PHQ-9), and Generalized Anxiety Disorder (GAD-7) questionnaires were administered to diagnose MWB, stress, depression, and anxiety, respectively. Conventional cutoff scores of WEMWBS-14 ≤ 40, PSS-10 ≥ 14, PHQ-9 ≥ 10, and GAD-7 ≥ 10 were considered for the diagnosis of low MWB, high perceived stress, high depression, and high anxiety, respectively.

**Results**

Students from 29 African countries, located in 31 cities and 54 universities, completed the survey. Of all, 20.15% had low MWB, 95.52% had moderate to high perceived stress, 29.85% had major depression, and 14.18% had high anxiety. The lowest MWB and the highest perceived stress were observed among students who tested positive for COVID-19, those who lost someone due to COVID-19, and those with behavioral changes. Moreover, major depression and anxiety were associated with being tested positive, job loss for parents, decreased incomes, financial difficulties, online studying, and being in lockdown.

**Conclusions**

The COVID-19 Pandemic has worsened the preexisted poverty and unemployment rate in African countries; therefore, affecting African students' mental health. Governments should consider financial support and collaborate with host universities to provide psychological counseling to all African students in need.

## 779

## SARS-CoV-2 Genomic Surveillance ( betwen April 2020-August 2022) and Reliability of PCR Point Mutation Assay (EscapePLEX) for the Rapid Detection of Variants of Concern in Cameroon

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**

SARS-CoV-2 ;Genomic surveillance ; EscapePLEX kit; Variants of Concern ;

**Introduction**

To inform decision-making for COVID-19 response, surveillance of SARS-CoV-2 variants of concern (VOC) and lineages is crucial.Though genomic sequencing is the gold standard, point mutation PCR is recommended for rapid surveillance of VOCs. We sought to study the dynamics of SARS-CoV-2 strains across different waves and to evaluate the reliability of SNP EscapePLEX kit for the rapid detection of VOC.

**Methods**

A laboratory-based study was conducted on SARS-CoV-2 positive nasopharyngeal specimens (Ct-value<30) at the Chantal BIYA International Reference Centre in Yaoundé, Cameroon, between April 2020-August 2022. For each sample, Sanger-sequencing and SNP-EscapePLEX kit were performed, using sequencing as gold standard to evaluate the performance of SNP-EscapePLEX.

**Results**

Of the 130 specimens (from individuals with median [IQR] age 38 [29-49], 53% female; 26% symptomatic);the dynamic of SARS-CoV-2 during wave-1 (April-November 2020) showed 97% (30/31) wild-type lineages and 3% (1/31) Gamma-variant; wave-2 (December 2020-May 2021) showed 25% (4/16) Alpha-variant, 25% (4/16) Beta-variant, 44% (7/16) wild-type lineages and 6% (1/16) mu; wave-3 (June-October 2021) showed 93% (27/29) Delta-variant, 3.5% (1/29) Alpha-variant, 3.5% (1/29) wild-type lineages; wave-4 (November 2021-August 2022) showed 98% (53/54) Omicron-variant and 2% (1/54) Delta-variant. Omicron sub-variants were 47% (25/53) BA.1, 34% (18/53) BA.5, 13%(7/53) BA.2 and 6% (3/53) BA.4. Overall sensibility and specificity of SNP-Escaplex was 84%[78-87] and 89%[76-95] respectively. Specifically, the sensitivity and specificity of SNP-Escaplex on Delta-variant was 75%[63-76] and 100%[96-100] respectively; the sensitivity and specificity of SNP-Escaplex on Omicron-variants was 96%[90-96] and 100%[93-100] respectively, without the ability in discriminating omicron sub-variants.

**Conclusions**

Genomic surveillance reveals a rapid dynamic in SARS-CoV-2 strains, moving from wild-type lineages to Omicron variants and sub-variants. For rapid variant surveillance in resource-limited settings, EscapePLEX represents a suitable alternative to genotyping. However, this point PCR assay needs to be upgraded for the surveillance of sub-lineages of concern under monitoring.

## 782

## DETERMINANTS OF SARS-CoV-2 INFECTION AMONG TRAVELLERS IN 2022 IN CAMEROON: TOWARD EVIDENCE-BASED INTERNATIONAL REGULATIONS FOR AFRICAN COUNTRIES

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**

COVID-19, epidemiology, positivity, viraemia, symptoms, Cameroon

**Introduction**

In Cameroon, COVID-19 infection spread rapidly in the general population, with up to 122,375 confirmed cases and continuous monitoring. However, situation reports focused on travelers are lacking, which limit revision/standardisation of COVID-19 international regulations across African countries. We thus sought to update the burden of COVID-19 and its epidemiological, virological and clinical features among international travellers in the Cameroonian context.

**Methods**

An laboratory-based study was conducted among international travellers tested for SARS-CoV-2 from January 2022 through June, 2022 at Chantal BIYA International Reference Centre, Yaounde-Cameroon. SARS-CoV-2 diagnosis was performed on nasopharyngeal swabs using Realtime qPCR. Statistical analyses were performed using SPSS and $p<0.05$ considered statistically significant.

**Results**

Out of 22,194 individuals (57.4% male) enrolled, 6.4% was symptomatic and 7.6% (1685/22,194) were vaccinated. The overall SARS-CoV-2 positivity was 0.7% (147/22194) from 0.2% (2/1047) in children (0-14 years) to 0.8% (11/1365) in elderly (>64 years), p=0.107. Positivity rate among symptomatic

individuals was 2.5% versus 0.5% among asymptomatic, p<0.001; and being symptomatic (aOR [95% CI]: 4.8 [3.2-7.1], P<0.001) was a predictor of SARS-CoV-2 positivity. Positivity among vaccinated versus non-vaccinated individuals was 0.83% versus 0.58% respectively, p=0.21. The month of February had the highest positivity rate (7.6%), and the month May with the lowest positivity rate (0.8%). Regarding PCR cycle threshold (CT), 32.0% of positive individuals had a CT <30. Among confirmed cases, those aged >40 years showed a non-significant higher proportion in high viral-load (CT<20): 9.8% versus 7.8%, p=0.682; symptomatic travellers showed a higher proportion with high viral-load (22.2%) compared to asymptomatic (5.4%), P=0.003.

**Conclusions**
In the current state of low SARS-CoV-2 burden (<1%) among international travellers in Cameroon, positivity is associated with symptoms and seemingly higher among the elderly. This evidence underscores the implementation of a symptom-driven "track-and-test" strategy focused on symptomatic and elderly travellers, regardless of vaccination status across Africa.

## 806

## Elective surgery system strengthening: development, measurement, and validation of the Surgical Preparedness Index (SPI) across 1632 hospitals in 119 countries

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Surgical preparedness, Elective surgery, Health system strengthening

**Introduction**
COVID-19 exposed the fragility of planned surgical services around the world. This study aimed to develop and validate a novel index to support local elective surgical system strengthening and address growing backlogs.

**Methods**
First, we performed a four-stage consensus process to develop a multidomain index for hospital-level assessment (Surgical Preparedness Index, SPI). Second, we measured preparedness across a global network of hospitals to explore its distribution at national, sub-national and hospital levels. Finally, we compared hospitals' SPI to their planned Surgical Volume (SVR) ratio, calculated as the observed surgical volume between 6 June and 5 August 2021 against the expected volume (2019). A linear mixed-effects regression model was used to determine the impact increasing SPI score.

**Results**
In the first phase, from a longlist of 103 candidates, 23 were prioritised as core indicators of elective surgical system preparedness by 69 clinicians from 32 countries. The multidomain SPI included 11 indicators in facilities and consumables, 2 in staffing, 2 in prioritisation, and 8 in systems. Hospitals could achieve a score from 23 (least prepared) to 115 points (most prepared). In the second phase, surgical preparedness was measured in 1632 hospitals by 4714 clinicians from 119 countries. The mean SPI score was 84.5 (95% confidence interval 84.1-84.9), which varied across high- (88.5, 89.0-88.0), middle- (81.8, 82.5-81.1) and low- (66.8, 64.9-68.7) income countries. In the third phase, 74.6% (1217/1632) of hospitals did not maintain their expected SVR during COVID-19. In the mixed effects model, a 10-point increase in SPI corresponded to a +3.6% (95% CI 3.0%-4.1%, p<0.0001) increase in SVR.

**Conclusions**
The SPI contains 23 indicators that are globally applicable, relevant across different system stressors, demonstrate subnational variation, and are collectable by frontline teams. Hospitals should

perform annual self assessment of their surgical preparedness to create resilience in local surgical systems.

## 852

## Port Health Services (PHS) at Points of Entry (PoE) during SARS-COV 2 Pandemic, the Nigerian experience, 2020 -2022.

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
SARS-COV 2, Nigeria, Surveillance, Port Health Services

**Introduction**
Port Health Services (PHS), Nigeria; the designated Public Health authority at the Points of Entry (POE) implements the International Health Regulation guidelines (IHR 2005) at the PoE by mitigating against importation and exportation of diseases at the PoEs. We conducted this study to describe Port Health Services (PHS) experience at Points of Entry during SARS-COV 2 pandemic.

**Methods**
On 30th January, 2020, WHO declared SARS-COV 2 Public Health Emergency of International concern. PHS activated and operationalized the National Public Health Emergency Contingency Plan (NPHECP-POE). Consequently, PHS reviewed and digitized her paper-based Passengers' Self-Reporting Form (PSRF) for enhanced surveillance for SAR-COV and other priority diseases. Digitized PSRF captures; socio-demographics, contact details, symptoms (in the last 14 and 21 days) for COVID-19 and other diseases, travel history, PCR negative test result and vaccination status.

**Results**
QR code is generated from PSRF filled and submitted online, travel permit is issued. Various travel advisories were developed as SARS-COV 2 pandemic evolved. Quarantine protocols and Standard Operating Procedures (SOPs) were developed for POIs. International travellers from hotspot countries were flagged as Persons of Interest (PoIs) for institutional quarantine.

PSRF was used to screen about 17,000 PoIs, 15th April – 12th June, 2020, about 1,257,560 passengers were screened including four inter-state PoE locations; Zuba, Bwari, Nyanya-Nasarawa and Gwagwalada. As of September 2021, over (1,874,560) passengers were screened at the PoE. In 2022, as of Epi week 32, over (2,714,560) passengers were screened at the PoEs. Their contacts was shared with relevant stakeholders and states of destination for contact tracing. Suspect ill persons identified were referred to health facilities and followed-up.

**Conclusions**
Surveillance is enhanced at the PoE with the digitization of the PHS paper-based Passengers Self-Reporting Form (PSRF), contributing to accurate data collection at the PoEs, strengthened collaborations, strengthened contact tracing during the SARS-COV 2 response.

## 853

## PRE-EXISTING IMMUNITY TO SARS-CoV-2 DURING THE PRE-PANDEMIC ERA IN CAMEROON: A COMPARATIVE ANALYSIS IN PEOPLE WITH VERSUS WITHOUT HIV-INFECTION

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
HIV, SARS-CoV-2, immunoglobulin G/M, TCD4 lymphocytes, HIV viral load.

**Introduction**
The lower burden of COVID-19 in tropical settings may be due to preexisting cross-immunity, which might vary according to HIV status. We sought to assess the overall SARS-CoV-2 seropositivity, and to determine SARS-CoV-2 seropositivity according to HIV-status during COVID-19 pre-pandemic era.

**Methods**
A cross-sectional and comparative study was conducted at Chantal BIYA International Reference Centre on 288 stored plasma samples collected before COVID-19 pandemic (2017-2018): 163 HIV-positive versus 125 HIV-negative. On each sample, Abbott PanbioTM COVID-19 IgG/IgM assay, was used for detecting SARS-CoV-2 immunoglobulin G(IgG) and M(IgM). Among people living with HIV (PLHIV), HIV-1 viral load and TCD4 cell count (LTCD4) were measured using Abbott m2000RT Real Time PCR and BD-FACSCalibur respectively. Statistical analysis was performed, with $p<0.05$ considered statistically significant.

**Results**
The median [IQR] age was 25 [15;38] years. Overall seropositivity to SARS-CoV-2 was 14.6% (42/288) of which 7.3% (21) was IgG, 7.3% (21) IgM and 1.0% (3) IgG/IgM. According to HIV-positive versus HIV-negative status, SARS-CoV-2 seropositivity was 11.6% (19/163) versus 18.4% (23/125) respectively, p=0. 07; IgG 6.1% (10/163) versus 8.8% (11/125), p=0.26; IgM 5.5% (9/163) versus 9.6%, (12/125), p=0.13. Among PLHIV, SARS-CoV-2 seropositivity according to CD4-count was 9.2% (≥500 cells/µl) versus 1.8% (200-499 cells/µl), OR 3.5 (p=0.04) and 0.6% (<200 cells/µl), OR 17.7 (p<0.01). According to viral load, SARS-CoV-2 seropositivity was 6.7% (≥40 copies/ml) versus 4.9% (<40 copies/ml), OR= 3.8 (p<0.01).

**Conclusions**
Before COVID-19 in Cameroon, cross-reactive antibodies to SARS-CoV-2 were in circulation, indicating COVID-19 preexisting immunity. Of relevance, COVID-19 preexisting immunity is lower with HIV-infection, specifically with poor CD4-cell count. Thus, COVID-19 preexisting immunity may contribute in attenuating COVID-19 severity in tropical settings like Cameroon. As poor CD4-count leads to lower cross-reactive antibodies (regardless of viral load), PLHIV appear more vulnerable to COVID-19 and should be prioritized for vaccination.

## 854

## High seroprevalence of anti-SARS-CoV-2 antibodies in the capital city of Chad

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**Keywords**
SARS-CoV-2, Anti-nucleocapsid antibodies, anti-RBD antibodies, neutralizing antibodies, COVID-19

**Introduction**
Since the start of the COVID-19 pandemic, Chad has 7,417 confirmed cases and 193 deaths, one of the lowest in Africa. This study assessed SARS-CoV-2 immunity in N'Djamena.

**Methods**
In August-October 2021, eleven N'Djamena hospitals collected outpatient data and samples. IgG antibodies against SARS-CoV-2 nucleocapsid protein (anti-N) were identified using ELISA. Anti-receptor binding domain antibodies (anti-RBD) detection was performed with chemiluminescence immunoassay. The characterization of anti-Spike neutralizing antibodies (NAbs) was carried out using pseudotyped vesicular stomatitis virus (VSV).

**Results**
Participants' average age was 31.9±12.6 years, with 25-34-year-old (35.2%) being the most represented group. 56.4% were women, making the ratio of women/men 1.3. Most were housewives and students. Overall anti-N seroprevalence was 69.5% (95% CI: 67.7-71.3), females 68.2% (95% CI: 65.8-70.5) and males 71.2% (95% CI: 68.6-73.8). > 44-year-olds had the highest seroprevalence (73.9%) while under-15s had a 57.4% positivity rate. Civil servants (71.5%), housewives (70.9%), and health personnel (9.7%) had the highest positivity. The VSV spike neutralization assay showed 59.0% of positivity with titers ranging from 1:10 to 1:4800. Low neutralizing antibody levels were in 81% of samples while 7% indicated high titer. The SARS-CoV-2 spike protein antibody assay revealed 95.0% positive for total anti-RBD antibodies (IgM, IgG, IgA) and 82.0% of positivity for IgG anti-RBD antibodies. Furthermore, our data reported 88.5% positivity for anti-N and total anti-RBD antibodies, 77.2% had both anti-RBD IgG and anti-N antibodies, while 80.4% were positive for both anti-RBD IgG and total anti-RBD antibodies.

**Conclusions**
Our results indicated a strong spread of SARS-CoV-2 in N'Djamena, despite low mortality and morbidity after the first two pandemic waves of COVID-19. The high presence of variant SARS-CoV-2 antibodies could explain the low rate of Covid-19 severity observed in these regions. This high seroprevalence must be considered in Chad's vaccine policy.

## 867

## Evaluation of community-based delivery and administration of the SARs-CoV-2 rapid antigen tests in a marketplace in Zambia

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Community COVID-19 testing, COVID-19 Antigen RDT

**Introduction**
To expand access to testing beyond public health facilities and to strengthen surveillance efforts for COVID-19, community testing using COVID-19 antigen-based Rapid Diagnostic Tests (Ag-RDTs) has been identified as a major area of focus in Zambia. The aim of this research is to gather evidence on the feasibility and acceptability of community testing in a marketplace.

**Methods**
A cross-sectional study with a mixed-method design was conducted in Mtendere market, a highly trafficked market in Lusaka Province. Participant data was collected prospectively via semi-structured surveys to explore individual satisfaction with testing, service delivery, and experience with self-quarantine for individuals testing positive. Feedback from the healthcare workers and site-based personnel on adaptation, challenges, and suggestions were also collected via separate surveys. All data was collected electronically via survey CTO platform and analyzed by STATA.

**Results**
The study population consisted of 1723 participants who voluntarily accessed COVID-19 Ag-RDT at the market testing sites with a positivity rate of 0.6% (n=10). 54% of the participants were male, and the median age was 28 years (IQR 20-39 years). 99% of participants reported no symptoms at time of the test. 59% of respondents indicated desire to know their COVID-19 status as the reason for testing and 32% indicated self-care. 67% and 33% of all respondents found the market testing experience and sample collection "very acceptable" and "acceptable" respectively. 100% of the HCWs that participated in the survey indicated that testing in the marketplace is feasible and acceptable. 50% of the positive cases completed quarantine, while 50% cited work schedules as reason for non-completion.

**Conclusions**
Community testing is feasible and acceptable intervention to increase testing access in Zambia, especially when coupled with community sensitization, education, and mobilization. This strategy provides an additional testing modality for countries to manage the epidemic.

## 884

## A review of national adoption of COVID-19 testing guidelines from WHO and Africa CDC reveals that adopting testing guidelines increased testing rates in African countries.

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Africa, national COVID-19 testing guidelines, guideline adoption and testing rates

**Introduction**
COVID-19 pandemic caught the globe off-guard with no guidelines on how to respond. We investigated the rate at which countries adopted PCR and Ag-RDT testing guidelines from WHO and Africa CDC and their impact on national COVID-19 testing rates.

**Methods**
An Africa-wide review of COVID-19 testing guidelines published online was conducted. We assessed time to adoption of the testing guidelines against WHO and Africa CDC guideline issue dates.

**Results**
Government websites of 22 countries were accessed for COVID-19 testing guidelines published online. Ten countries had guidelines in English and French that were reviewed. We excluded three countries with guidelines in Arabic and nine with unpublished guidelines. Of the 5 WHO-issued guidelines (PCR, Ag-RDT, Ab-RDT, self-testing and genomic surveillance), only PCR and Ag-RDT guidelines were published online. The median time to adoption of PCR guidelines from WHO issue date was 87 days (IQR: 57-141), with fastest adoption at 11 days by Nigeria and Ethiopia and slowest adoption in Zambia at 255 days. Countries adopted Ag-RDT guidelines before the WHO guideline issue date (median time: 289 days (IQR: 122-325)) with Lesotho earliest at 457 days before WHO issue date, followed by South Africa at 92 days prior. For most countries, earlier adoption of Ag-RDT guidelines followed Africa CDC, which issued Ag-RDT guidelines 304 days before WHO. Testing rates per 1000 population were higher six months after- than six months before- adoption of testing guidelines in South Africa (before:0.602±0.207; after:0.745±0.234, $p<0.001$), Nigeria (before:0.021±0.006; after:0.035± 0.015, $p<0.001$), and Rwanda (before:0.347± 0.094; after:0.871± 0.323, $p<0.001$).

**Conclusions**
In Africa, the adoption of PCR testing guidelines followed the WHO issue date while Ag-RDT guidelines followed the Africa CDC issue date. The presence of guidelines was associated with increased testing rates supporting the need to fast-track adoption of easy-to-use, affordable diagnostics as a key strategy in emergency response.

## 893

## Viral dynamics and factors favouring the duration of covid-19 positivity: Evidence from the first-three epidemiological waves in Cameroon

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**Keywords**
SARS-CoV-2, Positivity duration, Determinants, Viral dynamics.

**Introduction**
Evolution evidence of Coronavirus disease 2019 (COVID-19) and viral clearance time remains limited in tropical settings. Understanding this is crucial for public health control measures at community-level. We evaluated the viral dynamics of SARS-CoV-2 infection and factors associated with positivity duration in COVID-19 cases in Cameroon.

**Methods**
We conducted a prospective cohort-study of SARS-CoV-2 positive cases from the first to third wave (March 2020-October 2021) in Yaounde-Cameroon.RT-PCR was performed on

nasopharyngeal swabs. SARS-CoV-2 positivity duration was evaluated from the first to last positive test before a negative result. Epi-info V.7.0 was used for data analyses with $p<0.05$ considered statistically significant.

**Results**

A total of 282 participants were enrolled. The mean age was 41±14 years, with male predominant (62.1%). We had 15.6% symptomatic cases and cough most common (59.09%). The overall median positivity duration was 15[IQR:9-23] days with 15[ IQR:13-16] in the first, 17[ IQR:11-26] in the second and 8[ IQR: 4-12] in the third wave (p= 0.007). Positivity duration was significantly higher in males (16 versus 14 days, p=0.03) and people aged >40 years (15 versus 14 days, p=0.02). Positivity duration was not affected by presence or absence of symptoms (p=0.80). No significant correlation was found with viral load (r=0.03; p=0.61). Considering baseline (24.7±7.2Ct) and last viral load (29.3±5.9 Ct), the ΔCt (4.6±1.3) and positivity duration (15 days) revealed a kinetic in viral decay of 0.3±0.087 Ct/day.

**Conclusions**

A median positivity duration of 15 days is in accordance with viral clearance around 2 weeks for optimal confinement at community-level. Men and/or the elderly stand at higher risk of prolonged infection. Given the viral decay (0.3 Ct daily), we suggest personalized confinement periods. The variability of positivity duration according to phases could be function of strains which could be a factor of positivity duration.

## 896

## Factors Associated with COVID-19 Vaccine Uptake in the African Cohort Study

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**Keywords**

Vaccination, COVID-19, Vaccination Hesitancy

**Introduction**

Despite the availability of COVID-19 vaccines, vaccine hesitancy remains a major global health concern. Understanding factors associated with vaccine uptake would enable COVID-19 vaccine education campaigns to better address vaccine hesitancy in limited resource settings.

**Methods**

The African Cohort Study (AFRICOS) prospectively follows individuals≥15 years with and without HIV from 12 sites in Kenya, Uganda, Tanzania and Nigeria. Information about demographics, medical history, medications and COVID-19 vaccine uptake are collected every six months. Participants were included in the analysis if they had a study visit sinceMay 2021 when vaccines became available at AFRICOS sites. We used modified Poisson regression to determine factors associated with COVID-19 vaccine uptake by comparing adjusted prevalence ratios (aPR) and their corresponding 95% confidence intervals [95% CI] for selected factors.

**Results**

As of June 2022, 2738 participants had at least one visit with 394 (14%) reporting uptake of at least one dose of any COVID-19 vaccine. Compared to the Ugandan site, participants from South Rift Valley-Kenya, Kisumu-Kenya, Tanzania, and Nigeria were less likely to uptake a COVID-19 vaccine (aPR: 0.27[0.21-0.35], 0.06[0.03-0.10], 0.05[0.03-0.10],

0.18[0.11-0.28], respectively. Participants aged >30 years were more likely to uptake a COVID-19 vaccine (aPR: 3.84, 95% CI [2.63-5.59], 2.64 [1.80-3.87], 2.09[1.37-3.19] for ages 50+, 40-49, 30-39 years, respectively. Additionally, having a secondary or higher level of education (aPR: 1.62 [1.21-2.17]) as compared to primary or no education was positively associated with vaccine uptake. There was no observed significant difference in COVID-19 vaccine uptake between participants with and without HIV (PR.1.23 [.97-1.56]).

**Conclusions**

There is a need to continue educating the community at large about the importance of being vaccinated. Understanding the barriers contributing to low uptake of vaccines will be key in increasing vaccine uptake, the formulation of policies and the development of educational materials for COVID-19 and future vaccines.

## 935

## Adverse reaction following COVID-19 vaccine immunization among adults in Grand Kru County, Liberia, May-December 2021

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**Keywords**

Liberia, immunization, adverse-reaction, and COVID-19

**Introduction**

Background: WHO approved over 30 COVID-19 vaccines on the emergency use listing (EUL) to support the drive towards control of the pandemic. By midyear 2021, about 65% of the world's population has received at least one dose of the COVID-19 vaccine. However, fear of adverse events following immunization (AEFI) remains one of the reasons for vaccine hesitancy. We characterized adverse events following COVID-19 vaccination reported in Grand Kru County, Liberia from May to December 2021.

**Methods**

Methods: A review of AEFI surveillance records in Grand Kru County from May to December 2021 was conducted. We obtained COVID-19 vaccination data from the Expanded Program on Immunization and AEFI line list from the National Public Health Institute, cleaned, and analyzed data in Microsoft Excel. The variables of interest were age, sex, duration from vaccine administration to onset of symptom, and outcome. We calculated the incidence and presented patterns of adverse events following COVID-19 vaccination in the county.

**Results**

Results: Among 4,768 people vaccinated against COVID-19, a total of 171 (3.6%) reported AEFIs. The median age of the cases was 38 years (interquartile range: 30-44), and 92 (53.8%) were males. Fifty-two (30.4%) of the cases were hospitalized. The commonest AEFIs were fever 132 (77.2%), generalized body pain 123 (71.9%), fatigue 113 (66.1%) and headache 88 (51.5%). A total of 56 (32.1%) occurred within 24hrs of vaccination and 125 (73.1%) within 48hrs. All the hospitalized cases were given only supportive treatment and there was no fatality. Barclayville District reported majority, 72 (42.1%) of the cases.

**Conclusions**

Conclusion: AEFIs were reported following COVID-19 vaccination in Grand Kru County, most of which did not require hospitalization. Males accounted for majority of the cases, and most of the cases occurred within 48 hours of vaccination.

## 984

## Using a digital tool for COVID-19 screening and Rapid Antigen Testing at the household level by Community Health Workers in Rwanda

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**Keywords**
Community Health Workers, SARS-Cov-2, digital, testing, Rwanda

**Introduction**
An effective response to the COVID-19 pandemic required digitalization from reinforcing prevention measures, screening, testing patients, management, and follow-up. While the digitalization of COVID-19 testing was successfully achieved at health facility levels, the engagement of community health workers (CHWs) to reach the household levels was still missing. We evaluated the use of SARS-CoV-2 antigen-detecting Rapid Diagnostic Tests (AgRDTs) alongside a clinical screening digital tool 'e-ASCOV' to deliver household-level testing and contact tracing by CHWs.

**Methods**
We pilot-tested the ability of CHWs to use the e-ASCOV tool and perform AgRDTs in selected eight districts across the country. A total of 800 CHWs selected randomly from both rural and urban areas were trained in both delivering AgRDTs for COVID-19 testing, and data capturing using the e-ASCOV application on smartphones. We assessed the concordance between testing results by CHWs and professional laboratory technicians using a sample size of 499 symptomatic randomly selected participants. We performed also PCR on 529 samples negative to AgRDTs to assess the performance of AgRDTs.

**Results**
From February to May 2022, CHWs screened 19,544 participants, of whom 4,575(24.9%) had COVID-19-related symptoms or with history of exposure to the infection. Among them, 86 (1.9%) were positive. The concordance of testing results was perfect (100%), Cohen's Kappa of 1.0. Of the 800 trained CHWs 731 (91.3%) were independently able to conduct household-based COVID-19 screening, perform AgRDTs and send data to the central server.

**Conclusions**
The study confirmed the ability of CHWs to use digital tools and COVID-19 testing using AgRDTs. The findings shown also the practicability to implement testing at the household level, thus community-based surveillance for early case management and control interventions. This study prompts a reasonable necessity and opportunity to use digital tools for other diseases to support healthcare services delivery closer to the community, and for evidence-based decision making.

## 986

## Seropositivity to Anti-SARS-CoV-2 Antibodies according to Vaccine-Status in Cameroon (EDCTP PERFECT-Study): Towards Herd Immunity and Revised Vaccine Strategy?

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
SARS-CoV-2; COVID-19; Seropositivity; Vaccination; Cameroon

**Introduction**
Anti-SARS-CoV-2 vaccine remains a global health priority, but evidence on its significance within tropical settings like Cameroon remains limited. We assessed the overall rate of SARS-CoV-2 immunity, its disparity according to vaccine-status and types of vaccines administered in Cameroon.

**Methods**
A cross-sectional study was conducted throughout April-2022 among individuals tested for COVID-19 at the Chantal BIYA International Reference Centre-(CIRCB) in Yaoundé-Cameroon. Socio-demographic and detailed clinical data were collected; SARS-CoV-2 antibody was tested on whole blood using Ninonasal™ COVID-19 IgG/IgM assay, while SARS-CoV-2 real-time PCR was performed on nasopharyngeal swabs using DaAn gene 2019-nCoV kit. Statistical analyses were performed with $p<0.05$ statistically significant.

**Results**
Overall, 380 participants were enrolled: median [IQR] age was 41 [33–50], 59.2% men, 2.9% (11/380) with flu-like symptoms, 11.6% (44/380) with comorbidities and 21.6%(82/380) reporting previous SARS-CoV-2 positivity. Regarding COVID-19 vaccination, 70.1% (267/380) had received at least one dose (45.3% Pfizer, 26.2% Johnson&Johnson, 13.4% Moderna; 6.8% AstraZeneca, 3.7% Sinopharm) and 64.5% (245/380) were fully vaccinated. Median duration [IQR] post-vaccination was 4 [3–8] months. Overall, anti-SARS-CoV-2 seropositivity was 67.1% (255/380), with 0.5% (2/380) IgM, 63.1% (240/380) IgG and 3.4% (13/380) IgM/IgG. By age, seropositivity was 66.9% (<50 years) versus 67.7% (≥50years), p=0.87. Vaccination was associated to anti-SARS-CoV-2 seropositivity (aOR=1.8 [95%CI: 1.1–2.9]; p=0.014), and Pfizer was the only vaccine with a significantly high rate of antibodies (OR=2.6 [95%CI: 1.5–4.6]; p=0.002). Following real-time PCR, confirmed cases was 2.6% (10/380) all with low viral-loads (CT-value>34), of whom 50% (5/10) were positive to anti-SARS-CoV-2 IgG and 70% (7/10) were breakthrough infections (9 [6–10] months post-vaccination).

**Conclusions**
The high-rate of COVID-19 antibody suggests herd immunity at community-level. Vaccination contributes to a greater immunogenicity, remarkably with Pfizer vaccine. In this context, vaccine strategies should target vulnerable populations in the country, with revised policies guided by complementary investigations.

## 1015

## Une stratégie de communication sur le Covid-19 basée sur une enquête socio-anthropologique menée dans 5 pays d'Afrique de l'Ouest

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Covid-19 représentations communication enquête socio-anthropologique prévention

**Introduction**
L'adhésion aux mesures de prévention et à la vaccination est un enjeu majeur depuis le début de la pandémie, ce qui implique de développer une communication adaptée aux représentations des populations.

**Methods**
Pour l'Organisation Ouest Africaine de la Santé, nous avons mené une enquête socio-anthropologique mixte sur les représentations du Covid-19 au Burkina Faso, au Cap Vert, en Côte d'Ivoire, en Guinée Bissau et en Sierra Leone. 200 personnes, en quotas représentatifs de la démographie, ont été interviewées en face-à-face dans chaque pays en octobre 2020 et 24 interviews en profondeur conduites dans trois pays en janvier 2021.

**Results**
97,6 % des interviewés avaient entendu parler du Covid-19 et 78,7 % ont répondu « oui » à la question « Savez-vous ce qu'est un virus ? ». 93,2 % à 99,7 %, selon les pays, avaient entendu les messages recommandant les gestes barrières. Alors que ceux-ci étaient peu respectés, notamment le port du masque dans des espaces publics comme les transports en commun, la très grande majorité considérait ces gestes utiles pour prévenir le Covid-19 (75,7 % à 98,3 % pour le port du masque). 20,1 % seulement savaient qu'une personne asymptomatique peut transmettre le virus. Les facteurs de risque étaient insuffisamment connus : 47,2 % savaient que le surpoids en est un et 67,1 %, le diabète ; 47,2 % des personnes de plus de 60 ans, seulement, savaient que l'âge est un facteur de risque. L'enquête qualitative a montré qu'une idée très partagée est que le Covid-19 existe, mais pas en Afrique.

**Conclusions**
Le sentiment de ne pas être exposé au Covid-19 et la méconnaissance des facteurs de risque semblent expliquer le manque d'adhésion à la prévention, gestes barrières et vaccination. Nous suggérons une communication centrée sur la réalité de la maladie dans la région et les particularités des personnes à risque de formes graves (âge et morbidités).

## 1033

## Impact of COVID 19 and its associated interventions on HIV/TB programmes: a case study to catalogue innovations and interventions deployed to maintain performance

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19 pandemic; HIV/TB, Impact, Innovations, South Africa

**Introduction**
Background: The COVID pandemic and its associated interventions i.e. lockdowns, rotational work among health care workers disrupted the implementation of the HIV/AIDS/STIs/TB (HAST) programmes nationally.

**Methods**
Design and methods: A quantitative retrospective observational design was used to assess impact of COVID using key HAST indicators, additionally key innovative interventions that worked were catalogued. Participants included patients accessing HAST services over 250 facilities in both Ehlanzeni (Mpumalanga province) and Thabo M (Free State province), with about 360 000 patients receiving ART/TB treatment as of 31/03/2022. Trends, year on year and quarterly comparisons were conducted for PHC headcount, HIV/TB case finding, ART/TB initiations, and retention of patients. Overtime join point regressions were computed through control charts to explore overtime impact and recovery on key indicators.

**Results**
Results: After the start of COVID-19, there was a significant reduction in performance for key the following indicators: PHC Headcount (-10%), HIV Case finding (-25%), registered TB cases (-62%), New TB Cases (-64%), and ART initiations (-35%). Additionally, an increase in the number of HIV/TB missed appointments, resulted in a reduction of patients remaining on ART (-2%). Through implementation of targeted interventions, a gradual recovery of all HIV/TB indicators is noted, particularly patients remaining on ART (+7%).

**Conclusions**
Conclusions: COVID-19 affected the performance of HIV/TB indicators negatively. DMoC were crucial at both facility and community levels in restoring HAST gains during the pandemics first year. All indicators improved to comparable pre-COVID levels except headcount. The rapid scale up of vaccinations through the ADAPT mechanism, are pivotal and continue to have the most significant impact in restoring and maintaining HAST gains.

## 1039

# Excess mortality at regional referral hospitals in Uganda during the COVID–19 pandemic (2020–2021)

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Excess mortality, COVID–19, Uganda

**Introduction**
Regional referral hospitals in Uganda were designated by the Ministry of Health (MOH) as COVID-19 treatment units. However, limitations on testing and poor mortality surveillance systems complicate the analysis of data on the true burden of deaths associated with the pandemic. Excess mortality calculation is one way to overcome this. We estimated excess mortality at regional referral hospitals (RRHs) in Uganda during two years of the pandemic (2020–2021) compared with five years of historical data (2015–2019).

**Methods**
Monthly aggregate deaths and admissions data were abstracted for 15 RRHs from the MOH District Health Information System (DHIS2) from 2015–2021. We estimated excess mortality by calculating 2020 and 2021 deaths/10,000 admissions and compared them to expected levels using the upper bound of the 95% confidence interval of historical average over 5–years (2015–2019) before the pandemic (threshold). Excess mortality percentage is derived as excess mortality divided by expected mortality threshold.

**Results**
Out of 15 RRHs, excess mortality exceeded expected levels at 13 (86%) and 11 (73%) hospitals in 2021 and 2020. Overall, excess mortality at RRHs exceeded expected levels for six months: April (7%), May (2%), June (25%), August (10%), October (4%) and November (4%) in 2020 and six consecutive months from June to November (57%, 25%, 22%, 1%, 10%, 6%) in 2021. The highest peaks in excess mortality were registered in June for both years but the peak in 2021 doubled that in 2020.

**Conclusions**
Compared to historical data, excess mortality at RRHs exceeded expected levels for six months in both 2020 and 2021. Using excess mortality as an indicator can help MOH monitor the trajectory of epidemics in different regions to guide targeted control measures that avert preventable deaths due to health system shocks.

## 1058

## Association between vaccination and COVID-19 disease severity: investigation of an intra-hospital outbreak in Tunisia

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, Vaccine, Severity, Tunisia

**Introduction**
On December 25th, 2021, a cluster of Omicron variant COVID-19 among inpatients at Habib Thameur academic hospital was reported. We investigated the outbreak in order to identify the index case, to test and isolate contacts and to limit the transmission and diminish the epidemic magnitude. The objective of this study was to identify the potential association between the severity of COVID-19 disease and the vaccine status.

**Methods**
We carried out a cross-sectional study, throughout a cell phone interview for patients with PCR confirmed COVID-19. The Omicron variant was investigated only for the first patients. We collected sociodemographic characteristics, vaccine status, comorbidities, symptoms, hospitalization and death. The severity of the disease was evaluated by the death of the patient. We investigated the association between the death and the vaccine status in univariate and multivariate analysis.

**Results**
We included 196 patients, 66% were female, the median age was 42 years (IQR: 32-56) and 61.2% had contact with positive people. Seven percent of patients were non vaccinated, 21% had one dose of vaccine, 57% had 2 doses, 20% had the booster dose, 42% had comorbidities, 9.5% had hypertension, 10.5% were immunosuppressed, chronic respiratory and cardiac diseases were present among 6.5%, dysthyroidism was observed in 3% of patient, 14% had allergy and 7% had diabetes. About 22% of the patients were hospitalized and 2% died. In univariate analysis, vaccination, age, diabetes, immunosuppression were associated with the severity of COVID-19. Independent factors were vaccine uptake (OR=0.070 ; 95% CI 0.008-0.640 ; p-value=0.019) and diabete (OR=12.98 ; 95% CI 1.42-118.42 ; p-value=0.023).

**Conclusions**
From this exploratory survey, we can suggest that vaccine uptake was protective against Omicron variant COVID-19 severity. However, we recommend confirming this hypothesis by a cohort or case-control study.

## 1098

## Characterizing population movement and connectivity across borders to strengthen capacity to rapidly detect, prevent, and respond to a public health event

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Borders, COVID-19, Population, Movement, Rwanda , Pandemic

**Introduction**
Local and human population movement is common and important for the country economy. But this may also increase the spread of any communicable disease. 80% of migrants in Rwanda use the land borders. The first wave of COVID-19 in Rwanda was driven by people using land borders mainly truck drivers. This has indicated the weight of surveillance at the land borders. Thus, we aimed to identify space-temporal patterns of population mobility and connectivity across borders and clusters of people crossing borders to guide effective preparedness and response for the next pandemic.

**Methods**
To achieve our goal, we used a template of Population Connectivity across Borders (PopCAB) methodology adapted from CDC. A non-randomized sampling method (Quota sample) was used to choose interviewers of certain characteristic around the border such as border managers, local government leaders, health facility leaders, and other individuals representing a priority group from seven main borders. Four focus group discussions and one key informant interview were conducted per border.

**Results**
We identified the most visited locations, high mobility seasons, and clusters of people around all seven borders. The main frequently visited locations includes border points, markets, commercial centers, health facilities, touristic areas, hotels, resto-bars, and home visiting. The highest population mobility varies by border and seasons. Generally, the high mobility is seen in the period of June-September and end of the year period due to mainly tourism activities, wedding ceremonies, social activities and festival seasons. People also move more in working days for business-related activities. The main clusters of people that mainly use borders include truck drivers, people doing business, religious people and tourists.

**Conclusions**
The list of identified locations and mobility pattern of population around the borders should be used to enhance the preparedness and response to any outbreak from neighboring countries and also for tracing during the pandemic season.

## 1101

## The impact of Covid-19 on malaria services in three high endemic districts in Rwanda: a mixed-method study, September 2020

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Malaria, Covid-19, Service delivery, Mixed-methods, Rwanda

**Introduction**
Rwanda has achieved impressive malaria morbidity and mortality reductions over the past two decades. However, the disruption of essential services due to the current Covid-19 pandemic can reverse these gains. Therefore, this study assessed the impact of Covid-19 on malaria services in Rwanda.

**Methods**
We conducted a mixed-methods study in three purposively selected districts in Rwanda. Quantitative data were health facilities and community malaria data, including the number of malaria tests, uncomplicated malaria cases, severe malaria cases, and malaria deaths. We collected qualitative data using focus group discussions with community members and community health workers and interviews with providers and malaria programme staff. We conducted an interrupted time series analysis to compare changes in malaria presentations between the pre-Covid-19 period (January 2019 to February 2020) and the Covid-19 period (from March 2020 to November 2020). The constant comparative method was used in qualitative thematic analysis.

**Results**
Compared to the pre-Covid-19 period, there was a monthly reduction in patients tested in health facilities of 4.32 per 1000 population and a monthly increase in patients tested in the community of 2.38 per 1000 population during the Covid-19 period. There was no change in the overall presentation rate for uncomplicated malaria. However, the was a monthly reduction in the proportion of severe malaria of 5.47 per 100,000 malaria cases. Additionally, healthcare providers continued to provide malaria services. However, Covid-19 mitigation measures limited the availability of transportation options for the community to seek care in health facilities and delayed the implementation of some critical malaria interventions. The focus on Covid-19-related communication also reduced the amount of health information for other diseases provided to community members.

**Conclusions**
The Covid-19 pandemic resulted in patients increasingly seeking care in the community. Therefore, interventions should strengthen the community and home-based care models and integrate malaria messages into Covid-19-related communication.

## 1350

## Tracking COVID-19 rumors in Eswatini to increase uptake of vaccines

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19 vaccination, Eswatini, rumor tracking

**Introduction**
The COVID-19 pandemic affected Eswatini greatly, with a reported case fatality ratio of 1.9% and a public health system stretched to its limits. The advent of COVID-19 vaccines brought hope, yet when vaccines became available, only 35% of Eswatini's eligible population was vaccinated due to lack of demand, missing the national target of 70% and resulting the thousands of vaccines expiring. The USAID-funded EpiC project developed a community-based COVID-19 rumor tracking tool to understand factors that affect vaccine uptake.

**Methods**
Data was collected between January and September 2022 through District Health Information System 2 using a tool called Community Data for Action Platform (CDAP). Trained community data focal persons collected data daily which was then coded into different thematic areas. Data was collected from 54 of the 59 Tinkhundla (constituencies) in the four regions of Eswatini. The Rumor Tracking System (RTS) was part of the community dataset in CDAP.

**Results**
Of the 1440 rumors recorded, almost half (802/1440) had misinformation about COVID-19; while 25% (360/1440) further believed the death rate estimates were incorrect, people were not dying as reported. Of the 1633 rumors recorded under the 'topical beliefs' theme, 19% (316/1633) believed COVID-19 case counts were over/underestimated for political reasons. Almost a quarter, 22% (352/1633) believed certain medications can prevent or cure COVID-19 while 6% (101/1633) believed traditional and religious medicines are the cure for COVID-19. Nearly 10% (158/1633) further stated they believed COVID-19 does not exist. The project shared data with the COVID-19 team within the National Disaster Management Team. Some data has helped in shaping health promotion messages around COVID-19 vaccination.

**Conclusions**
In addition to strengthening healthcare service delivery in resource-limited settings, it is crucial to work with communities, understand context-specific barriers and cocreate interventions to address barriers and misinformation that may affect prevention of emerging new diseases.

## 1363

## Investigating the use, sharing, and adaptation of open-source online health education for health worker just-in-time training globally: Evidence from three studies

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
MOOCs, digital education, global health education; digital health; remote learning; health worker training

**Introduction**
The COVID-19 pandemic has demonstrated the global need for easily accessible open-source content for rapid health worker training. The massive open online course (MOOC) format is one strategy for widespread dissemination of emergency medicine training embraced worldwide. Yet, language, digital literacy, weak technical support, and access to internet and cellular coverage challenges persist. We synthesize the learnings of three studies on how MOOCs provided by Stanford's Digital Medic, the World Health Organization's Health Emergencies Programme, and the Digital Classroom Consortium were used, shared, and adapted.

**Methods**
In the first study, we analyze survey responses from 6,272 health workers to understand their motivations for enrolling in COVID-19 MOOCs offered by Stanford or the OpenWHO. The second study analyzes the enrollment patterns of 2,185 global learners and in-depth interviews from 12 health professionals who shared the COVID-19 Digital Classroom MOOC. The third study examines the survey responses from 918 global learners from four emergency health OpenWHO MOOCs to understand how they adapted content to share materials in low resource settings.

**Results**
The first study found that learners were primarily motivated to enroll in the courses to improve practice. The second study found that the MOOC was shared through health worker professional and personal networks. Enrollment patterns and qualitative data illustrate how health professionals shared information within their professional networks. In the third study, 78% of respondents indicated that they shared courses via their personal or professional through a range of

sources.They also indicated that they adapted the MOOCs to meet a variety of low-tech and local needs. Yet, while there was significant information sharing and adaptations they faced difficulties while making technical changes.

**Conclusions**
These studies illustrate how MOOCs are used globally by health workers. Yet, they also illuminate the need for more accessible, targeted, and contextualized content to reach hard-to-access communities globally.

## 1385

## Responding to COVID-19 in Guinea: How lessons learned from Ebola informed national- and community-level responses to the new pandemic, April 2022

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, Response, Ebola, lessons learned, Guinea

**Introduction**
The Covid-19 pandemic has significantly impacted health systems around the world, including in West Africa. Since Guinea faced the Ebola outbreak nearly 10 years ago, it is opportune to identify whether lessons learned during Ebola are being carried forward in the current response to Covid-19. Learning is a key element of health system resilience, which can enable a system to respond more effectively to future shocks. This abstract aims to highlight how the Ebola experience influenced the COVID-19 response in Guinea focusing on national and community level responses.

**Methods**
As part of a larger study on the impact of COVID-19 on health systems resilience (ACGSL), 7 key informant interviews were conducted with Government actors and 9 with actors providing in-country technical and financial assistance. The semi-structured interviews were recorded, transcribed and analyzed with Nvivo 1.5.2 software using both an inductive and deductive approach to thematic analysis.

**Results**
The key informants identified a number of ways in which the Ebola experience had a significant influence on the domestic response to COVID-19. These included the development and implementation of mitigation plans to ensure the continuity of healthcare services, ensuring the availability of skilled human resources to respond to the outbreak, and the re-vitalization of former Ebola treatment centers that were used to manage COVID-19 cases. At the community level, however, Ebola experience resulted in positive and negative responses. The Key informants reported that while community members seemed to largely accept the control measures established, the memories of Ebola triggered widespread fear and impacted health-seeking behaviors.

**Conclusions**
Lessons from Ebola both enhanced the response of health actors at the national level, and framed the reaction of individuals at the community level. This highlights the need for health systems to build on past experiences to address future health emergencies, with community members' experiences being a central component.

## 1390

# Adapting an HIV Online Learning Management System to Rapidly Support the COVID-19 Pandemic Preparedness of the Healthcare Workforce in Sub Saharan Africa

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Health workforce development, pandemic preparedness, COVID-19

**Introduction**
We describe how adapting an existing online training system developed by the Strengthening Interprofessional Education for HIV (STRIPE) program supported the rapid dissemination of COVID-19 knowledge to the healthcare workforce in Sub Saharan Africa (SSA).

**Methods**
Training materials, responsive to the evolving pandemic, were developed by the STRIPE program team with input from training partners across SSA. Training activities included online self-study and a live facilitated component, with interprofessional breakout group discussions, conducted either in person or via videoconferencing software. The first COVID-19 training module, "Preparing for and managing patients with COVID-19" (Patient Care), was developed in March 2020 with two additional modules developed in February 2022, "COVID-19 Vaccines & Vaccine Hesitancy" (Vaccines) and "Post-COVID-19 Condition" (PCC). Learner demographics were collected through a STRIPE registration questionnaire and feedback was collected through a post-course assessment and by training partners.

**Results**
As of September 2022, learners from 20 health professions training partner institutions across 14 countries completed the Patient Care (n=5,999 learners), Vaccines (n=633), and PCC (n=600) trainings. The highest participating health profession was nurses/midwives (Patient Care = 38%, Vaccines = 73%, and PCC = 75%) and those who completed Patient Care were 45% frontline healthcare professionals and 55% pre-service learners. Learners reported that these trainings helped them answer questions about COVID-19 and

provided health education to dispel COVID-19 myths. Including STRIPE training partners in the development process of the training materials was key to ensuring modules are relevant and applicable to local contexts.

**Conclusions**
Adding COVID-19 training material to an existing online training system was a feasible way to rapidly disseminate information to a transcontinental interprofessional audience. This was a practical solution to support pandemic preparedness which can be replicated for other contexts, audiences, or diseases globally.

## 1393

## Analysis of Systemic Equity and Gender Issues Affecting Product Introduction and Access to Covid-19 Vaccine in Kenya

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Covid-19, Gender, Equity

**Introduction**
Equity and gender issues are major barriers affecting access to COVID-19 tools such as diagnostics, therapeutics and vaccines. Women and girls are negatively impacted by gaps both in supply and demand leading to inequitable distribution of the vaccine. We highlight systemic equity and gender issues affecting product introduction and access to COVID-19 vaccines in Kenya.

**Methods**
We utilized a mixed methods design involving desk review and key informant interviews from 52 healthcare providers, 12 Civil Society Organizations and 2 Ministry of Health officials from 19 counties in Kenya. Quantitative data was analysed descriptively using MS excel and qualitative data using content analysis.

**Results**
Representation of women in the National COVID-19 response committee remained low at 19.6%. At the initiation of COVID-19 vaccination there were more males accessing vaccines compared to females. 52% reported that gender norms significantly affected access to vaccination. However, the trend changed towards the end of the period with more females presenting themselves for vaccination. Utilization of youth friendly interventions was reported in 45% of facilities in Kenya. Vulnerable and marginalized groups such as Persons with disabilities, Female sex workers, Lesbians, Gay and prisoners were unwillingly left out from COVID-19 response interventions. Using community outreach sites to take COVID-19 vaccination services closer to the people, was effective in enhancing uptake of vaccines. Common barriers to access included beliefs and myths, inadequate information among community members, inadequately facilitated vaccine service provision centers, gender norms, roles and relations

**Conclusions**
Creating demand, addressing misinformation and a mix in vaccine delivery mechanisms targeted at different priority populations is an effective way to improve vaccine uptake and achieve greater equity in coverage. Inclusion of gender/vulnerable and marginalized groups experts in the drafting of national COVID-19 response plans is crucial for ensuring gender mainstreaming and equity in the national response plans.

## 1406

## Delivering routine health services during Covid-19: A social network analysis of the organizations working on malaria during the pandemic in Guinea:

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
health systems resilience, social network analysis, malaria, covid-19

**Introduction**
Health systems all around the world, including in West Africa, faced a new public health threat with the arrival of COVID-19. Evaluations of national responses to COVID-19 highlight that preserving health system functions is one of the elements that underline highly effective national responses to the pandemic. Ensuring the delivery of routine health services requires actors to work together. This study aims to analyze the structure and composition of the national network of organizations working on malaria prevention, diagnosis and treatment and to establish the extent to network members are connected to organizations working on COVID-19.

**Methods**
A social network survey (SNS) was conducted with key actors working on malaria and COVID-19 in Guinea (n=9). The R software was used to perform the analysis which included constructing a sociogram and analyzing structural indices such as the centrality, the distance and the reachability between the organizations. In addition to the survey, key informant interviews were conducted (n=16). These were analyzed using NVivo software and a thematic analysis approach.

**Results**
Sociograms developed during the analysis highlight key characteristics of the network including the network shape. The most central actor to the network, the frequency of interactions between network members and the types of the services (prevention, diagnostic and treatment) actors offer will be highlighted. The extent to which malaria and COVID-19 actors interacted during the pandemic will also be illustrated. The qualitative data will provide information on how and why relationships varied during the pandemic.

**Conclusions**
The findings demonstrate the importance of exploring the nature of links between different health actors in order to identify how collaboration can be improved to ensure the continuation of routine health services during a pandemic.

## 1409

## Knowledge, attitude and practice of community-oriented resource persons (CORPs) on COVID-19 in Niger and Kebbi States, Nigeria, October 2020: a rapid assessment

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
iCCM, COVID-19, Malaria, Pneumonia, Diarrhoea, CORPs

**Introduction**
Integrated Community Case Management (iCCM) is an equity-focused strategy extending the reach of public health services by providing timely and effective treatment of malaria, pneumonia and diarrhoea to children under 5 years in hard-to-

reach populations. During the COVID-19 pandemic, global technical guidance on infection prevention and control protocols among community health workers was issued by WHO and UNICEF and adapted by countries.

**Methods**
We assessed the effect of the COVID-19 pandemic on service provision and evaluated knowledge, attitudes, and practices (KAP) of community-oriented resource persons (CORPs) in an existing iCCM program in two states (Niger and Kebbi) in Nigeria from August 2020 to October 2020. 341 CORPs were randomly selected from the two states and a rapid assessment of commodities, clients' patronage, community awareness and KAP of CORPs regarding COVID-19 was done. Telephone interviews were carried out by trained data collectors using structured questionnaires and appropriate KAP regarding COVID-19 among CORPs as well as possible influencing factors were analysed

**Results**
The response rate for the study was 100% and all CORPs had received information about COVID-19, majority through radio (82.9%). Majority of CORPs (95.9%) reported they observed no significant changes in number of caregivers seeking iCCM services compared to the pre-COVID-19 era. However, 10.3% and 13.2% of CORPs reported stock-out of malaria rapid diagnostic tests and artemisinin-based combination therapies respectively, lasting more than 3 months. Most CORPs interviewed knew signs and symptoms of COVID-19 (83.6%) and 95.9% knew how to prevent the disease. Also, 80.1% of CORPs reported they did not avoid patients with symptoms indicative of COVID-19 in previous week before the study and 96.2% wore face masks while attending to patients.

**Conclusions**
The pandemic did not adversely affect iCCM service provision and CORPs demonstrated satisfactory knowledge, attitudes, and practices in delivering safe and effective iCCM services in the context of COVID-19.

## 1411

## Common mental health challenges among COVID-19 survivors and Frontline healthcare workers: an exploratory qualitative study

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Mental health, stigma, depression, stress, anxiety

**Introduction**
The COVID-19 pandemic presented an epidemic threat to mental health in developed and developing countries. Zambia, though affected by the COVID-19 pandemic, does not have adequate research on related stigma, discrimination, and mental health issues. We conducted an explanatory qualitative study to understand the experienced stigma among COVID-19 survivors and frontline health care workers in Zambia.

**Methods**
From November 2021-February 2022, we conducted in-depth interviews (IDIs) among purposefully sampled COVID-19 survivors from COVID-19 registers at referral facilities in Lusaka and Nakonde districts, the epi center of the early COVID-19 epidemic. We conducted 24 IDIs with health care workers who had at least 3-months work experience in the COVID-19 center in these facilities and 24 IDIs with COVID-19 survivors (25 men, 23 women). We conducted thematic analysis using a hybrid approach to code the interviews.

**Results**
Most health care workers viewed themselves as being at risk of contracting COVID-19 due to their exposure to COVID-19 patients which raised their anxiety. They also experienced stigma from

community members, friends, relatives and colleagues, which caused them mental stress, anxiety and depression. Lack of proper and adequate personal protective equipment, drugs, and oxygen concentrators hindered their capacity to provide COVID-19 treatment and fueled their fear of contracting COVID-19. COVID-19 survivors experienced self-stigma due to inadequate knowledge, leading to most of them feeling depressed.

**Conclusions**
In order to reduce the occurrence of mental health problems during a pandemic of a novel disease, healthcare workers need access to mental health counseling services and resilience training (psychological first aid) as part of their routine practice. More efforts are needed to keep communities informed regarding COVID-19 and to design innovative ways to convey the threat of the disease without raising moral and stigmatizing narratives.

## 1596

## A multiphase social science study in 2022 to inform a communications strategy for COVID-19 vaccination among adults in South Africa and Zimbabwe: Lessons for future pandemic communications campaigns

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19 vaccines, Southern Africa, social science, communications, qualitative

**Introduction**
Despite swift vaccine development and delivery, demand for COVID-19 vaccines did not meet supply. The Vaccine Information Network (VIN) was a pilot study, addressing an unmet need to provide stakeholders with essential information for effective campaigns to promote uptake of COVID-19 vaccines. Through VIN, we evaluated motivations for and barriers to vaccination to develop communications recommendations to strengthen COVID-19 vaccination in South Africa (SA) and Zimbabwe (Zim).

**Methods**
VIN was a multiphase, mixed methods social science study among adults 18 years+ in SA and Zim. Focus group discussions(FGDs) (N=18) were stratified by age, vaccinated/unvaccinated, and HIV status (Zim only). One in-person and two follow-up telephonic interviews were conducted among participants receiving their first COVID-19 vaccine at public vaccination centres. Data were used to interrogate context-specific messaging and communications failures and recommendations through community dialogues (N=8). FGD data were analyzed using framework analysis and survey data using SAS.

**Results**
Surveys: Of 2016 participants enrolled across both countries, most had positive vaccination experiences, family and friends as well as traditional media (television and radio) were most trusted sources for COVID-19 information.

FGDs: Top motivators included accessibility of vaccination sites, encouragement from close friends/family and health care workers, trust in the efficacy of vaccines, knowing someone who died of COVID-19, personal protection and fear of COVID-19 infection. Distrust in the government and health

system, and vaccine safety concerns posed barriers to vaccination.

Community dialogues: Across countries, participants wanted consistent and updated information from trusted sources. In SA, communities raised importance of engaging religious and traditional leaders for health systems strengthening.

**Conclusions**
Data support context specific, community consultative approaches to communications campaigns for health systems strengthening during pandemics. Study findings have been shared with relevant stakeholders to inform communications campaigns for COVID-19.

## 1603

## Evaluation of the COVID-19 laboratory-based surveillance system in South Africa, 2020-2021

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19, Laboratory-Based, Surveillance, South Africa

**Introduction**
The COVID-19 pandemic requires swift response and a strong surveillance system. The COVID-19 laboratory-based surveillance system was used for monitoring cases, trends and informing public health actions. We aimed to evaluate the strengths and weaknesses of the COVID-19 laboratory-based surveillance system in South Africa.

**Methods**
We carried out a descriptive cross-sectional study following a mixed methods approach to assess the system's attributes (usefulness, simplicity, data quality, acceptability, flexibility and timeliness). We used the USA Centers for Disease Control and Prevention (CDC) guidelines for evaluating a surveillance system. Qualitative data was collected from participants using an online questionnaire. Quantitative data on COVID-19 collected from 2020-2021 was extracted from the Notifiable Medical Conditions line list (NMCList). Data was analyzed and presented using descriptive statistics.

**Results**
The turnaround time for the laboratory results to be reported to the corporate data warehouse (CDW) ranged from 0 to 266 days. Reporting was found to be timely. We found that 96% of test results were reported to the NMCList system within 24 hours (1 day) of testing. Completeness was found to be 99%. The system was simple and adaptable to changes in case definitions. Also, the system was flexible enough to incorporate data from the DATCOV system which collects data on COVID-19 hospitalisations. Both private and public laboratories have accepted the system and submit their results to a unique national data repository

**Conclusions**
We found that the COVID-19 laboratory-based surveillance system was useful and was able to monitor disease trends, estimate the incidence and provide situational reports. The system plays an important role in detection and reporting of COVD-19 cases in South Africa. Evaluation of the surveillance system shows that it has the capacity to detect, respond and contain the disease. Although its function is optimal, there is room for improvement.

## 1606

## Knowledge and practice of preventive measures against COVID-19 and malaria among COVID-19 suspected cases in Abuja, Nigeria, 2021

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Knowledge, Practice, Preventive measures, COVID-19, Malaria, Nigeria

**Introduction**
Malaria and COVID-19 share symptoms like fever, headaches, difficulty in breathing and fatigue. Identifying a patient as positive for COVID-19 or malaria based on symptoms alone, might be misleading, especially during epidemic response. However, good knowledge and practice of preventive measures against both diseases may help in early suspicion and reducing their burden. We therefore assessed knowledge and preventive practices against both diseases among COVID-19 suspected cases in Abuja, Nigeria.

**Methods**
We conducted cross-sectional study in five selected tertiary health facilities in Abuja, among 254 febrile patients attending COVID-19 screening centers. All consenting cases were recruited into the study. Data was collected with a structured interviewer-administered questionnaire. We collected samples for malaria and COVID-19 testing. We calculated means, standard deviations, and proportions.

**Results**
The mean age was 37.1±12.6 years. Only 2% tested positive for malaria, and 1.8% tested positive for COVID-19. None had co-infection. Many respondents identified fever (190, 74.8%) and headache (160, 63.0%) as cardinal symptoms of malaria. Most knew correctly that parasite causes malaria (155, 61.0%) and the mode of transmission was mosquito bites (247, 97.2%). Few (39, 15.0%) had good knowledge of malaria.

Most identified fever as symptom of COVID-19 (159, 62.6%) and knew that virus causes the disease (175, 68.9%), while 226 (89.0%) knew that mode of transmission was direct contact with an infected person/respiratory droplet. Majority (236, 92.9%) had good knowledge of COVID-19.

Most maintained social distancing (151, 59.4%) and wore facemask in public places (164, 64.6%) and only 84 (33%) strictly observed strict COVID-19 IPC protocols, while 29 (11.4%) did not practice any preventive measures against malaria.

**Conclusions**
There is need for more sensitization on malaria and COVID-19 especially for a tropical setting like Nigeria. Sensitization is expected to also improve practice of preventive measures against both diseases.

## 1617

## Using Implementation Science Framework and Strategies to Mobilize Human Resources forHealth During the COVID-19 Pandemic in Sudan

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**Conference Track**
Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
Vaccine, Community Engagement, COVID-19 Pandemic, Health Response

**Introduction**
Human resources in health (HRH) have always been a challenge in terms of mobilization and utilization during health emergencies. We implemented a COVID-19 response program integrating all levels of

HRH, including students, professionals and local communities in response to health emergencies.

**Methods**
We used the RE-AIM framework (reach, effectiveness, adoption, implementation, maintenance/sustainability) to implement the inter-professional volunteer-based Community Medical Response Team (CMRT) in Sudan. In January 2021 we recruited health professionals and students to create neighborhood-based teams. We developed a multifaceted implementation strategy which included: 1) assessing for readiness and barriers in the community and volunteers, 2) identifying and prepare champions including inter-professional health students and graduates 3) organizing implementation meetings on a weekly basis 4) staff training through the Project ECHO platform and 4) stakeholder engagement of community, religious, and governmental leaders.

**Results**
The first phase of implementation started in January 2021 by recruiting 371 volunteers in 6 states; identifying and meeting weekly with 20 champions; partnering with stakeholders including emergencies, epidemics control, and quality directorates at the ministry of health, Isolation centers, community organizations and leaders; staff training through ECHO platform; and home management of COVID-19 patients. Second Phase mobilized volunteers to conduct COVID-19 awareness campaigns, leading to the third phase in August 2021 to increase vaccine uptake through community sensitization followed by mobile vaccine clinics. In 2022 the project expanded to primary care, health promotion, reproductive health, and health emergencies. The number of volunteers increased from 371 to 1531 in 11 states.

**Conclusions**
Through mobilization, capacity building and integration, CMRT worked actively in recognition, prioritization, and implementation of community engagement projects, COVID-19 management, and vaccination to fill in the service delivery gaps in Sudan. This model of successful integration of volunteers within the system along with the outcomes achieved can be followed to advance HRH outcome in low-income countries.

## 1618

# Acceptability of COVID-19 Vaccination among Healthcare Workers in Sudan, 2021: A Cross-Sectional Survey

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Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**
COVID-19;Vaccine acceptability; Healthcare workers; Sudan

**Introduction**
Following emergency approval of COVID-19 vaccines, several studies have investigated COVID-19 vaccine acceptance and hesitancy especially among healthcare workers (HCWs). Nevertheless, the acceptability of the COVID-19 vaccine by HCWs in Sudan remains unclear. This study aims to investigate the acceptability of the COVID-19 vaccine and it's determinants among the HCWs.

**Methods**
A web-based cross sectional study design was used to study COVID-19 vaccine hesitancy and its associated determinants. The semi-structured questionnaire was distributed electronically, data collection took place from March-April 2021. Data was cleaned and analyzed using SPSS version 25. frequency tables was done for categorical variables , Means (M) and standard deviations (SD) were estimated for the continuous variables Bivariate analysis and multivariable logistic regression analysis was performed to

test determinants of acceptance of COVID-19 vaccination.

**Results**

A total of 576 HCWs have responded to the survey with mean age of 35 years. The majority were females (53.3%), medical doctors (55.4%), and located in the capital state; Khartoum (76.0%). The absolute refusal of COVID-19 vaccine was expressed by 16% of the respondents while 57% were willing to get vaccinated. Males were twice to four times more likely to accept the vaccine. Lower acceptability of COVID-19 vaccine was significantly associated with the nursing profession (OR= 0.35, 95% CI:0.15-0.82,P<0.00), increased perceived harm from the vaccine (OR= 0.11, 95% CI:0.05-0.23,P <0.00), lack of confidence in the source of vaccine (OR= 0.16, 95% CI:0.08-0.31,P=0.00), organizations and government supervising COVID-19 vaccination process (OR=0.31,95% CI:0.17-0.58 P=0.00)

**Conclusions**

This study highlights a moderate level of COVID-19 vaccine acceptability by the HCWs in Sudan. Effective communication of correct, regular, up-to-date evidence on the safety and effectiveness of vaccines is crucial to building trust in vaccines. Special consideration should be in place to address vaccine hesitancy among female HCWs and the nursing profession.

## 1642

## SARS-CoV-2 detection and circulating variants among supporters at fan zones during the 33rd African Cup of Nations in Cameroon

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**Conference Track**

Track 5: The COVID-19 pandemic – Lessons Learned for Future Health Threats, Prevention, Preparedness and Response

**Keywords**

SARS-CoV-2; AFCON, case detection rate, whole genome sequencing; circulating variant

**Introduction**

Safe return to mass gathering events remain critical for COVID-19 pandemic control. "Health passes" (documentation of vaccination and/or negative COVID-19 test result within 48 hours) were introduced at stadium and fan zone (FZ) entrances as an epidemic control measure during the 33rd African Cup of Nations (AFCON). We report the SARS-CoV-2 detection rate and circulating variants among supporters presenting to FZ without valid health passes during AFCON.

**Methods**

A cross-sectional survey was conducted among supporters at FZ entrances in Yaoundé and Douala, Cameroon. SARS-CoV-2 antigen rapid diagnostic tests (Ag-RDTs) were offered to all eligible participants on a voluntary basis. Each consenting participant testing positive was sampled for confirmatory real-time-PCR and Spike-region sequencing for variant surveillance using the Stanford algorithm (v8.9) and molecular phylogeny with MEGA (v.10). The case detection rate was estimated using PCR-confirmed SARS-CoV-2 cases; demographics and COVID-19-related survey responses were summarized.

**Results**

In total, 4,820 FZ attendees (median [IQR] age 30 ([24, 38]), 27.7% females) were tested for SARS-CoV-2. History of COVID-19 was reported by 476 (9.9%) participants; 1,228 (25.5%) were fully

vaccinated. Of 4,820 participants, 148 (3.1%) had a positive Ag-RDT result. Among 67 consenting to PCR testing, 29.7% (19/64) were confirmed PCR-positive (three results unavailable). The case detection rate was 40.1 (95% CI: 24.2 - 62.7) per 10,000 attendees. COVID-like symptoms and comorbidities were reported by four (e.g., cough, runny nose, fever) and two (cancer, diabetes) PCR-confirmed participants, respectively. Omicron variant (B.1.1.529) was found in all 11 samples successfully sequenced.

**Conclusions**
The case detection rate was low among AFCON attendees who accepted rapid antigen testing at FZ entrances. Omicron was the predominant circulating variant. Discordant rapid antigen testing and PCR verification indicate the need for enhanced quality assurance of test procedures and results to provide critical information on positivity rates and viral variants at mass gathering events.

## Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

## Oral

### 662

### Cross-Border and In-Country Disease Surveillance, Western Kenya

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
Cross-border, In-country, Disease Surveillance

**Introduction**
COVID-19 pandemic demonstrated ease of cross-border transmission of infectious diseases, rigorous surveillance notwithstanding. Points of entry of countries are impervious to unauthorised persons but porous to disease pathogens. Community transmissions have demonstrated gaps in rapid detection and control of infectious diseases once they pass borders. For these reasons, Lake Region Economic Bloc (LREB)-Kenya consisting of 14 county governments and PharmAccess Foundation implemented digitized integrated disease surveillance and response (IDSR) tool to collect data on confirmed and suspected diseases to compare border and in-country counties. The partnership then evaluated disparities

**Methods**
Ministry of Health form MoH 505 was configured in commcare application accessible on internet enabled android phones. 81 sub-county disease surveillance officers from 109 LREB Health facilities were trained on data submission using IDSR tool. They submitted data on confirmed and suspected cases. This data was collect between April and August 2022. The data was analyzed, visualized on dashboard in user-friendly formats, and interpreted.

**Results**
The three Boarder Counties reported more data; 81643, 49599, and 45,183 –accounting for 49.4% of total submitted data. The 11 in-country counties reported 50.06% of data. Migori borders the Tanzania while both Busia and Bungoma border Uganda. 85% and 52% of TB, and malaria, respectively were reported in border counties. Moreover, suspected cases of Anthrax and cholera were only reported in the border counties. Only 15% of TB and 38% of malaria cases were reported in in-country counties. Alternatively, 3 in-country counties submitted least data; 5488, 10181, and 11432. Two Consistent Counties exhibited little fluctuation in data reporting; 45183, and 32510, but reported less than border counties. During the

period, suspected cases of Anthrax and cholera were only reported in border counties.

**Conclusions**
In-country counties require increased capacity to rapidly detect and report infectious diseases.

## 664

## Leveraging multisource data for modeling and forecasting the COVID-19 New Cases in Rwanda Using Reproduction number (Rt) based Bayesian approach

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
COVID-19, Modeling, forecasting , Rt

**Introduction**
Although currently the COVID-19 pandemic is slowing down in Rwanda, as it is globally, its evolution remains uncertain for the coming months and there's a continued need to accurately forecast its evolution. The most reliable forecasting models reuse existing accumulated COVID-19 data (testing, treatment and vaccination). However, lots of valuable data are fragmented and can't be leveraged in their current status. This is a first effort in Rwanda reusing those data for predicting new cases and real-time reproductive numbers.

**Methods**
We performed Real-time Bayesian estimation of epidemic approaches based on standard SIR-class models; and then build a model in a discrete probabilistic form and quantified uncertainty in the estimation of epidemiological parameters and future cases and assimilated new data to reduce the uncertainty. For the prediction of new cases, fitted local polynomial regression models using weighted least squares, giving more weight to the nearest points whose response was estimated and less weight to points further away. We have adjusted the vaccine coverage and dynamics of SARS-COV2 variants in the prediction. We performed a sensitivity analysis to evaluate the performance.

**Results**
Real-time reproductive number (Rt) was estimated using Rwanda data. The model developed for prediction proved to fit the data better and was able to forecast the new cases in the next 100 days. The model was validated. The accuracy of the model was above 95%. The estimation approach developed can be applied to other outbreaks that might occur in the future.

**Conclusions**
This study built statistical models to predict new cases and real-time reproductive numbers that serve as an early warning tracking system of a new infection. This work finding enable the policymakers to implement evidence-based prevention measures and inform the strategies to limit the spread of disease. The models are scalable for the other pandemics in Rwanda beyond the COVID-19.

## 726

## The effect of e-Learning on retention of maternal and neonatal health knowledge among community health workers in Rwanda

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
e-Learning, community health workers, digital health, Rwanda

**Introduction**
Community health workers (CHWs) in Rwanda play a pivotal role in providing community-based health services. However, gaps in training and supportive supervision impede their ability. The USAID Ingobyi Activity, led by IntraHealth International, conducted a study assessing the effect of e-Learning on CHWs' retention of community-based maternal and neonatal health (CBMNH) knowledge.

**Methods**
We used a prospective cohort study design to measure knowledge acquisition and retention from an e-Learning refresher CBMNH course among 36 CHWs. CHWs were assessed via a structured questionnaire pre- and post-training and completed a follow-up assessment at six months. We conducted the study from April-October 2021 in six health centers in Rutsiro District. Descriptive analysis was conducted and three paired t-tests were used to measure the mean difference in results.

**Results**
Overall performance scores on the e-CBMNH course improved after training. The average score increased from 86% pre-test to 98% in the post-training test, with a mean difference of 11.70 ($p<0.001$). The test score in the follow-up assessment conducted six months later was 98% with a mean of difference between pre-test and post-test of 11.27 ($p<0.001$), which was very close to the post-test score, indicating that the study participants had retained the knowledge acquired from the course. The study showed a statistically significant association between age category and pre-test ($p=0.01$) and post-test ($p=0.04$) scores, with the youngest age group having a high average score.

**Conclusions**
The e-Learning approach is an effective strategy to fill gaps and extend CBMNH knowledge retention for CHWs when resources for in-person refresher training are constrained and when traveling is a challenge due to significant distance or COVID-19 travel restrictions. The self-paced nature of the approach enhances course completion, knowledge acquisition, and retention. The use of smartphones presents an important opportunity for delivering regular refresher training and sustaining CHWs' knowledge.

## 741

## Medical Diagnosis Systems: Data collection and Application Development Experience in Nigeria

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
Electronic medical records, digital health, medical informatics, adoption of eHealth, Nigeria, Developing countries

**Introduction**
Electronic medical records (EMR) are extensively used in developed countries to manage patient

records and facilitate consultations and follow-up of treatment. This has resulted in centralised databases where different services and clinicians can quickly access patient data to support healthcare delivery. However, adoption and usage of EMR in developing countries is almost non-existent. Clinicians depend on paper based-records with no centralised database to manage patient records.

This study aimed to investigate the propensity of clinicians and senior management personnel in healthcare facilities to adopt EMR and evaluate the contextual factors that impact or impede adoption. Using Davis's technology adoption model extended with other factors, we determined if contextual or situational factors are associated with barriers that impede adoption of EMRs in developing countries.

**Methods**
Using a cross-sectional quantitative research approach, data was collected data across four states in the Niger Delta region of Nigeria. Stratified random sampling was used to select healthcare facilities that and respondents. Data was collected by trained research assistants and a total of 1177 valid responses were received and analysed using factor analysis and multiple regression analysis.

**Results**
Usefulness, critical success factors, awareness and relative advantage significantly influence clinicians' intention to adopt EMRs(Odds Ratio 18.357, 2.404, 1.525 &1.427). Meanwhile, risk and data security both negatively influence adoption(OR -0.050 &-0.191) Ease of use (H2) was not deemed to be very crucial for the adoption and usage of EMR.

**Conclusions**
Our study suggests that usefulness and anticipated success factors in facilitating operations within healthcare facilities have a great influence on user adoption of EMR. User perception of risk and safety of data decreases their propensity to adopt EMRs.

We recommend creation of awareness, training and education of users on the effectiveness and usefulness of EMRs to increase adoption.

## 837

## Assessment of Climate-Driven Variations in Malaria Transmissionin Senegal Using the VECTRI Model

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
Malaria; VECTRI; Validation; Senegal

**Introduction**
Several vector-borne diseases, such as malaria, are sensitive to climate and weather conditions. This study, which aims to better understand the link between malaria transmission and climatic factors at the national level, aims to validate the VECTRI model (VECtorborne disease community model of ICTP, TRIeste) in Senegal.
Will the VECTRI model succeed in reproducing the spatio-temporal variability of malaria transmission in Senegal?

**Methods**
In this study, a VECTRI model driven by ERA5-Land, CPC, ARC2 and CHIRPS reanalysis data was used to simulate malaria parameters, such as the entomological inoculation rate (EIR) in Senegal. The spatial and temporal representation of observed malaria data from the National Malaria Control Program in Senegal (PNLP) was compared with that of simulation results with VECTRI (EIR) for the period 2009-2019.

**Results**
This study showed an agreement between observations and simulations. The results showed that the peak of malaria occurs from September to October. These results also indicate that the

southern zone of Senegal is the most exposed to the risk of epidemic spread of malaria compared to the northern zone.

**Conclusions**
The results highlighted the unimodal form of the temporal occurrence of malaria. The contrast of seasonal transmission of malaria is closely linked to the latitudinal variation of rainfall in the south-north direction over Senegal.

The findings of the document are expected to guide early warning systems and community coping strategies in Senegal, which will feed into national malaria prevention, response and care strategies tailored to the needs of local communities.

## 1242

## Establishing an agile technology-driven solution for COVID-19 containment in the Free State Province of South Africa

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
COVID-19; agile outbreak response; surveillance

**Introduction**
Following the first laboratory confirmed COVID-19 case in Free State on 12 March 2020, it was evident that the best method to contain further spread was through an aggressive containment strategy through early track and trace and breaking chains of transmission. Given the vast geographic landscape and central locality of the Province, the only way to contain spread, was to deploy contextual, agile technology driven solutions that support breaking of chains of transmission. This paper describes the process of establishing the data management system aimed at containing the spread of COVID-19 in the province.

**Methods**
The Free State health department adopted various COVID-19 data management applications under the ambit of the Bophelong Management Information System (BOMIS). BOMIS consisted of mobility track and trace capability using mobile network operator and social media data and COVID case management. This included digital symptom screening, laboratory confirmed results, contact tracing, contact monitoring (with off line capability and accessibility of mobile phones), case investigation and monitoring including hospital admissions and outcomes

**Results**
Executive dashboards for daily surveillance that illustrated cases, recoveries, deaths, admissions, contacts, healthcare worker cases and other critical indicators such as COVID-19 bed availability were developed. Mobile movement of cases and contacts mapping were included. A data lake was established that interfaces between the National Institute for Communicable Diseases (NICD) and various other sources to enable the Department to develop analytics using granular data and develop bespoke predictive models. This enhanced daily surveillance meetings between Provincial Joint Operations Committee (ProvJoc) and political leadership of the province.

**Conclusions**
Establishment of BOMIS supported the containment of the COVID-19 outbreak in the province through effective breaking of the transmission chains and this offered an opportunity to revitalize health system. BOMIS resulted in digital savvy Community Healthcare Workers through collaborations with mobile network operators, local Universities and various non-governmental organizations.

## Poster

### 525

## FEASIBILITY AND DIAGNOSTIC ACCURACY OF A TELEPHONE WOUND HEALING QUESTIONNAIRE IN DETECTION OF SURGICAL SITE INFECTION FOLLOWING ABDOMINAL SURGERY: A STUDY WITHIN A TRIAL IN SEVEN LOW AND MIDDLE-INCOME COUNTRIES

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**Conference Track**
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**Keywords**
Surgical site infection; Abdominal surgery; Global health; Diagnostic test accuracy study; Cohort study; Study within a trial; Wound Healing Questionnaire; Patient-reported outcome measure

**Introduction**
Telemedicine has been rapidly adopted to follow-up patients after surgery during the SARS-CoV-2 pandemic with little formal evaluation. This international study within a trial aimed to evaluate the feasibility and diagnostic accuracy of telephone administration of an adapted Wound Healing Questionnaire (WHQ) in the detection of surgical site infection after abdominal surgery in low- and middle-income countries.

**Methods**
A multi-centre, international, non-randomised prospective validation study embedded in a randomised trial pathway. The host trial was a pragmatic multicentre factorial randomised controlled trial testing measures to reduce surgical site infection in LMICs (FALCON, NCT03700749). The reference test was in-person review by a trained clinician at 30-days after surgery. The index test was telephone administration of the adapted WHQ by an independent non-surgeon researcher at 27 to 30-days after surgery, with item responses summarised using an overall point score between 0 and 29. The primary outcome measure was diagnostic accuracy of the WHQ, defined as the proportion of surgical site infections.

**Results**
Patients were included from three upper-middle income (396 patients, 13 hospitals), three lower-middle income (746 patients, 19 hospitals), and one low-income countries (54 patients, 4 hospitals). The telephone contact rate was 90.3% (1088/1196). The WHQ discriminated patients with and without SSI (AUROC 0.869, 95% CI 0.824-0.914). A range of point cut-off values for SSI threshold were presented to support implementation of the WHQ in research and practice. A representative cut-off point score of >4 demonstrated sensitivity of 0.701 (0.610-0.792), specificity of 0.911 (0.878-0.9430), positive predictive value of 0.723 (0.633-0.814) and negative predictive value of 0.901 (0.867-0.935). Some differences were seen in discrimination in rural (AUROC 0.818, 0.721-0.914) versus urban populations (AUROC 0.886, 0.836-0.937) and after emergency (AUROC 0.871, 0.826-0.916) versus elective surgery (AUROC 0.966, 0.895-1.000).

**Conclusions**
This study demonstrated feasibility and validity of telephone assessment for post-discharge SSI diagnosis in low-resource environments.

### 529

## Towards an efficient digital assessment of atherosclerosis.

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
Blood flow modelling, atherosclerosis, coronary artery, fractional reserve.

**Introduction**
Cardiovascular diseases (CVDs) are still a major cause of mortality, killing more than 17.9 million worldwide each year according to the World Health Organization. An estimated 7.4 million are due to coronary heart disease and 6.7 million to a stroke. Atherosclerosis is the most common pathology that lead to stroke.

**Methods**
In this study, we use computational fluid dynamics (CFD) and finite elements method to simulate blood flow in realistic cardiovascular domains issued from imaging. In order to assess the severity of coronary lesions, we use the obtained pressure distribution to estimate the fractional reserve for patients with atherosclerosis. This approach is based on the Fractional Flow Reserve (FFR) test which takes place during the diagnosis phase of atheroclerosis. The (FFR) test is usually invasive, in our case and through the simulation, it is virtual and need no surgery. For the validation, we conduct a statistical study to measure the accuracy of our estimates.

**Results**
We could obtain an automated functional tool to visualize blood flow through the coronary tree. The model also provides an estimation of the fractional reserve in the case of patients with atherosclerosis.

**Conclusions**
This kind of digital tools are important to support the clinical decision without inducing any extra-costs or causing any additional harm for the patients . During the diagnosis of coronary lesions, the clinician might requires the (FFR) test or not. When it is required, especially for intermediate lesions, he has to perform an intervention with a pressure captor to measure the fractional reserve. Based on the found value, he decides whether placing a stent is necessary for the patient or not. The utility of such a test also resides in the fact that it can save the cost for the possible future stenting procedure.

## 671

## Spatio-temporal dynamic of the COVID-19 epidemic and the impact of imported cases in Rwanda

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**Keywords**
COVID-19, Spatio-temporal models, impact

**Introduction**
Africa was threatened by the coronavirus disease 2019 (COVID-19) due to the limited health care infrastructure. Rwanda has consistently used non-pharmaceutical strategies, such as lockdown, curfew, and enforcement of prevention measures to control the spread of COVID-19. Despite the mitigation measures taken, the country has faced a series of outbreaks in 2020 and 2021. we investigate the nature of epidemic phenomena in Rwanda and the impact of imported cases on the spread of COVID-19

**Methods**
We modeled the nature of epidemic phenomena, and we assessed the impact of imported cases on the spread of COVID-19 using the endemic-epidemic Spatio-temporal models' framework. Our study provides a framework for understanding the dynamics of the epidemic in Rwanda and monitoring its phenomena to inform public health

decision-makers for timely and targeted interventions.

**Results**
The findings provide insights into the effects of lockdown and imported infections in Rwanda's COVID-19 outbreaks. The findings showed that imported infections are dominated by locally transmitted cases. The high incidence was predominant in urban areas and at the borders of Rwanda with its neighboring countries. The inter-district spread of COVID-19 was very limited due to mitigation measures taken in Rwanda.

**Conclusions**
The study recommends using evidence-based decisions in the management of epidemics and integrating statistical models in the analytics component of the health information system.

## 673

## Needs, contents and acceptability of an SMS based Digital adherence tool for children and adolescents living with HIV in Kilimanjaro, Tanzania: A mixed method study from Sep 2021- Mar 2022.

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**Keywords**
CALHIV- Children and adolescents living with HIV, PLHIV – People living with HIV, DAT- Digital adherence tools, SMS- Short message service

**Introduction**
Children and adolescents living with HIV (CALHIV) form a significant proportion of people living with HIV (PLHIV). Good adherence to medication is needed to achieve the last UNAIDS goal of 95% virological suppression. However, medication adherence is a major challenge. Digital adherence tools (DAT) like Wisepill have been found feasible among adult PLHIV. However, there are concerns about unwanted disclosure of the HIV status due to the wording used in short message service (SMS) texts. We aimed to assess the needs, contents and acceptability of SMS based DAT among CALHIV.

**Methods**
We conducted a mixed method study among children with their caregivers, and adolescents. A survey was used to collect data on phone use and need for medication reminders among 284 CALHIV. We purposely selected 40 participants that used the intervention (Wisepill + SMS + adherence feedback) for a month. SMS were of different contents, from straight questions about medication intake to more neutral. After one month, they received adherence feedback based on automated generated reports. Then, we did exit interviews, in-depth interviews and FGDs. We conducted descriptive and thematic content analysis. Results are presented following the Sekhon framework of Acceptability.

**Results**
DAT was found acceptable and was perceived effective in reminding medication time. Participants were happy to use the device and receive reminder SMS that used general language, did not mention the word medication and which were not easy for people to understand its intention. Feedback on adherence reports inspired good adherence behaviour. None of the participants experienced unwanted disclosure or stigmatization due to DAT, however five percent of adolescents were concerned about being daily monitored.

**Conclusions**
DAT with reminder SMS and tailored feedback was acceptable among CALHIV. More neutral wording in SMS were preferred. These will be used in the trial which will assess the effectiveness of DAT in improving adherence among CALHIV.

## 744

## Impact of Digitized Community Health Toolkit on Child Health Outcomes in Rural Uganda

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
iCCM

Digitized Community Toolkit

Child Health Outcomes

**Introduction**
In 2019, Uganda's ministry of health (MoH) launched the community health roadmap outlining priority needs for the community health program, including investing in scale up of appropriate technology for community health implementation and supervision. Since August 2020, Malaria Consortium (MC) has been supporting MoH to develop its digitised Community Health Toolkit (CHT) within its community health information system.

MC funded and provided technical assistance into development of the iCCM+ module of the CHT platform by aligning with updated 2021 iCCM+ guidelines and pilot implementation in Buikwe district. The main goal of this study was to assess the impact of digital iCCM on child health outcomes.

**Methods**
To assess impact, Kayunga district was selected as a counterfactual to Buikwe district; with a sample of 20 public facilities from each district. To assess trends, data collection was conducted for the period April 2021 to March 2022 grouped into two: (i) Before the CHT platform period: April to November 2021 and (ii) CHT platform intervention period: December 2021 to March 2022.

**Results**
Combined OPD attendance due to malaria, diarrhea and pneumonia among children U5 declined, significantly, from 46% to 32% (p-value: <0.001) in Buikwe compared to a non-significant change from 47% to 46% in Kayunga (p-value: 0.073). Malaria related admissions among children U5 declined significantly from 16% to 13% (p-value: <0.001) in Buikwe compared to a non-significant decline from 16% to 15% in Kayunga (p-value: 0.098). Also, malaria deaths among children U5, computed per 100,000 population per year, declined in Buikwe from 71.7 deaths to 59.5 deaths compared to a slight decline in Kayunga from 76.1 deaths to 73.1 deaths.

**Conclusions**
We envisage that the CHT intervention in Buikwe district was instrumental in enabling availability of services for children U5 in the community leading to reduction in the burden at the health facility.

## 831

## A qualitative study of users' experiences after 3 months: the first Rwandan diabetes self-management Smartphone application "Kir'App"

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**Conference Track**
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**Keywords**
Rwanda, Diabetes, Self-management, Smartphone Application

**Introduction**
Owing to the increasing popularity of smartphones in Rwanda, almost 75% of the entire population currently has access to the internet. Although it has been shown that smartphone applications can support diabetes self-management, there was no diabetes self-management application available in Rwanda until April 2019. Based on the findings of a prior study assessing the needs and expectations of potential users, 'Kir'App' was developed to fill that void. The aim of this study was to evaluate users' experiences after 3 months of use of the first Kir'App prototype.

**Methods**
The participants of the previous study were recruited to take part in the current study. Semi-structured, in-depth, face-to-face interviews were conducted. Findings were analysed thematically using Mayring's method of qualitative content analysis. Both deductive and inductive approaches were used to analyse transcripts according to the original categories and subcategories of the previous study.

**Results**
A total of 14 people with either type 1 or type 2 diabetes participated in the study. Age of participants ranged from 19 to 70 years, with a mean age of 34.4 years. Seven of the eight original themes and one additional theme were subjoined: diabetes education and desired information provision; increased diabetes knowledge and awareness; monitoring and reminder functions; nutrition; physical activity; coping with burden of disease; app features; use behaviour and usability. Overall, participants stated that the app increased their diabetes knowledge and assisted them with their diabetes self-management.

**Conclusions**
We found that the first prototype of Kir'App meets the overall needs and expectations of participating Rwandan diabetics. Having followed a strict user-centred design process, their qualitative insights will help to further improve the app.

## 843

## Lessons learnt from data mapping on the health services' response to the COVID-19 pandemic at a higher education institution.

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**Keywords**
Data mapping,COVID-19, Health services response, Higher education institution.

**Introduction**
The Rwandan educational system was faced with the impact of the COVID-19 pandemic starting in March of 2020. Studying the response to the pandemic has implications for public health systems and helps in understanding a system's resilience and mitigation. This study describes the experience and challenges with data collection for a pandemic resiliency study at the University of Global Health Equity.

**Methods**
We collected data on several COVID-19 cases and the number of tests done by the University's health system from March 2020 to December 2021. After this, we sought documents on health protocols and preventive measures. These elements were then used to describe the University's response. The process of data collection was reviewed, and

challenges were identified. Qualitative descriptors were used to characterize the challenges and thematic analysis performed.

**Results**
Within the first two years of the pandemic in Rwanda, a total of 3,625 COVID-19 tests were performed at the University, with 41 testing positive. Data was stored in different locations as tests were performed at the University through mass and individual testing. This testing was performed at administrative offices. The multiple sources of data had different recording and storage formats, including handwritten registers, excel spreadsheet and word documents. Protocols showed revisions, but old and revised protocols were not dated, so proxy dates had to be applied by matching email communications.

The emerging themes were heterogeneity of data recording, multiplicity of storage sites, incompleteness and inadequate record archiving.

**Conclusions**
The challenges encountered with data collection call for an information system that organizes and integrates patients' data and administrative protocols for timely retrieval and systematic analysis. A health services' digital platform supporting data analytics can address these issues and will likely improve both real time management of threats as well as retrospective enquiries on such performance.

## 851

## A review of COVID-19 rumors at the peak of the pandemic in Nigeria

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**Keywords**
Rumor, Consequence, Covid-19, Misconceptions, Theme

**Introduction**
Rumors are unreliable bits of information that circulate online or between individuals, eroding confidence in recognized authority and impeding the use of preventative measures. The onset of the COVID-19 epidemic in 2020 raised a number of doubts, including rumors, conspiracy theories, and false information. Community involvement and risk communication can promote openness, foster trust, and halt the spread of rumors. Our study examined the sources, patterns and potential consequences of rumors on Nigeria's COVID-19 response.

**Methods**
Over a 12-month period (February 2020–January 2021), a total of 9,340 COVID-19-related items were extracted and examined from the Nigeria Centre for Disease Control (NCDC) rumor log database managed by an infodemic standing team. Variables extracted for analysis include: rumor monitoring source, category, unabridged theme and consequence. Data were manually coded using content analysis until consistent themes emerged, while descriptive and cross classifications statistics were carried out on quantitative variables.

**Results**
Rumors classifications include: speculations (52%), facts (23%), misconceptions (13%), mistrust (6%) and others (4%). The NCDC media monitoring (51%) and the media toolkit (47%), according to the results, are the main monitoring sources of rumors. Of the identified themes, two were major: "Cure/prevention and treatments" (42%) and "Cases/deaths" (34%). Potential outcomes associated to the cure/prevention theme includes mis/distrust (26%), causes harm (24%) and causes conflicts (22%). Causing panic/fear (29%), harming (27%), and mistrust (21%) are consequences related to the theme of cases/deaths. The identified themes guided the choice and development of Social and Behavior Change (SBC) content such as

radio spots, print materials and community level engagement for different target audiences.

**Conclusions**
Speculations, misconceptions and misinformation may breed mistrust, which could have unfavorable effects. Regular monitoring and analysis of rumors and addressing such with accurate information through SBC interventions are necessary to protect the public from negative consequences.

## 899

## Leveraging public, private partnerships to operationalize the novel COVID-19 Electronic Vaccination Data System (EVDS) in South Africa

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
electronic vaccination, COVID-19, novel, public-private partnerships

**Introduction**
Funding from the U.S. Agency for International Development, Right to Care and partners supported the South African National Department of Health (NDOH) to operationalize the country's first client level electronic vaccination data system (EVDS) for COVID-19, through strategic partnerships between public and private sector stakeholders. This novel single health information ecosystem integrates public and private sector providers into an authoritative registry of COVID-19 vaccinations, and provides strategic information to inform decision-making and program planning.

**Methods**
50 staff were on-boarded to provide leadership, project management, and operational support. Training packs, infographics, cheat sheets and key messaging was developed for national roll-out. Seven focal streams were supported a) Site Go Live b) Master Facility List c) Self registration and scheduling d) Training and change management e) Data analytics f) Helpdesk support and g) Reimbursement modelling for the private sector.

**Results**
Between March-September 2021, 1,818+ public and private sector sites were onboarded , 53 virtual training sessions conducted with 3,400 EVDS administrators and vaccinators. This enabled 12 million + doses being administered by 3,161 clinicians at peak. 9 provinces received ongoing virtual training and support. 25,000 sites and 4,000+ geolocation records were curated and 6,000+ sites geocoded. 70% clients using the scheduling module vaccinated on the day of their appointment.

**Conclusions**
NDOH, through public-private partner support, implemented a first-of-its kind, complex project, providing near real-time access to strategic information for decision-making and reporting.

## 902

## Fighting COVID with health workforce data: Findings from the early COVID-19 response in Mali and Kenya

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
COVID, Mali, Kenya, Health workforce

**Introduction**
COVID-19 surges have had a significant impact on health service delivery in low- and middle-income countries where human resource systems were already weak even before the pandemic. The objective of this intervention was to use available health workforce, demographic, and epidemiologic data to address surges in caseloads during the first waves of COVID-19 in 2020 in Mali and Kenya using simple tools and dashboards created by WHO Europe and modified by IntraHealth International for use in Africa.

**Methods**
This case study details the use of facility x cadre data on available health workforce from the integrated human resources information system (iHRIS), daily estimates of workload (e.g., COVID cases) from epidemiological SIR models, and data on COVID risk factors from the 2018 Mali Demographic and Health Survey (DHS) to provide granular data to the governments of Mali and Kenya in March-April 2020.

**Results**
In just 6 weeks, the intervention provided the governments of Mali and Kenya was useful information to plan for the impending first wave of COVID-19. Mali hired additional social workers and cleaners, opened up new beds in designated units, and identified an unsuspected but critical hotspot of transmission in Timbuktu. In Kenya, the estimates informed a policy shift to isolating mild cases outside of hospitals in dormitories and hotels to free up hospital beds and staff for more severe cases. Skills were transferred through training of the trainers and an implementation guide produced jointly with the WHO which is downloadable with the tools.

**Conclusions**
This intervention highlights the need for investments in pandemic preparedness information systems to catalogue health worker location, demographics, and training which allows a country to activate the needed health workforce to respond to a pandemic surge in cases.

## 1108

## Utilization of Electronic Logistical Management System (eLMIS) for vaccines supply chain in Kenya: Lessons from Chanjo eLMIS

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
Supply chain, Vaccines, COVID – 19, Data Visibility, eLMIS

**Introduction**
The Coronavirus pandemic demonstrated rigidity of the vaccines supply chain in the country. The supply chain was forced to adapt like in many other sectors with speed and agility in response. The traditional supply chain was linear with delivery happening from national to regional, subcounty and health facility levels respectively. The pandemic commodities were not distributed following this traditional supply chain and created a need to track real time movement of the vaccines and supporting commodities through the country. Chanjo Elmis, a web-based tool was used to track the commodities as they were distributed.

**Methods**
In collaboration with the National Vaccines and Immunization Program (NVIP), CHAI reworked the system to allow addition of COVID-19 vaccines and dry commodities such as syringes and safety boxes. CHAI deployed the cold chain module, an active inventory of all cold chain equipment (CCE) in the country, detailing functionality, maintenance, and storage capacity of the CCE. This contributed to accurate volume allocation of vaccines including COVID-19 vaccines across the country.

**Results**
Inclusion of COVID-19 vaccines and commodities increased the system's utilization from 75% in July 2022 to 93% as at July of 2022. An increase in the overall number of vaccines and related commodities being tracked in the system (22 as at December 2020 to 33 as at March 2022, a 33% increase) was noted. All the 5 additional ultra-cold equipment and over 8000 CCE are also tracked on the system.

Integration with the main health repository, Kenya Health Information system (KHIS) was done, and this provided access to data to technical working groups to review and make data-based decisions that impact immunization activities including those related to the COVID-19 pandemic.

**Conclusions**
Chanjo eLMIS enables end – to end visibility of both routine and COVID-19 vaccines and offers real time data for data driven decisions.

## 1155

## Tracking of malaria cases using TESTsmART mobile application: Lessons from a trial to evaluate provider- and client-focused interventions in western Kenya.

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
mRDT, Malaria, ACT, Mobile Application, Private Retail Sector.

**Introduction**
In Kenya, ~71% of ACTs consumed are sold in the private retail sector, which rarely offers diagnostic testing or reports malaria cases through routine surveillance channels. In response to this challenge, the TESTsmART mobile application was developed to enable reporting, image capture for quality control of mRDTs, and financial transactions with participating outlets. In this work, we describe the use of the TESTsmART application in reporting malaria case management in a random sample of 40 retail medicine outlets in western Kenya.

**Methods**
The mobile application is built on an Android platform with a cloud-syncing function and consists of three main modules: Customer registration (age, gender, symptoms), Diagnosis and Treatment. The diagnosis module provides camera functionality, enabling image capture of RDT cassettes which are subsequently synced to a server. The treatment module captures which medications are dispensed. Outlet attendants were trained on RDT procedures and the use of the TESTsmART app. Once data was uploaded, the supervision team reviewed the mRDT images to check for test quality, and accuracy of reported results and provided feedback for improvement. ACT subsidies were provided to shops through the app when clients tested positive.

**Results**
Over 18 months, 53,736 suspected malaria cases were reported, 27,770 received an antimalarial without a test, and 25,388 had a test with 2,780 (10.92%) positive. All images were reviewed and 726 were flagged for follow-up based on test performance, interpretation or image quality problems. 2,741 clients with a positive test were given ACT at a subsidized rate and ~300,000 KES were paid as subsidies for ACTs. Dashboard data was used for program performance monitoring. Users reported functionality challenges included; syncing errors, service unavailability, network downtimes and non-responsive camera functions.

**Conclusions**
Reporting malaria tests and ACT dispensed using mobile applications by retail medicine outlets can enhance malaria surveillance activities in the private sector.

1416

# Utilization of a digital platform to scale up quality improvement activities in Rwanda.

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**Conference Track**
Track 6: Digitalization, Modelling and Analytics to Support an Effective Public Health Response, from Outbreaks to Pandemics and Beyond

**Keywords**
digitalization, quality improvement, client-centered outcomes, health systems

**Introduction**
Optimizing client-centered outcomes requires quality improvement (QI) programs bolstered by timely data use. Most health facilities in Rwanda have not optimized systematic implementation of QI strategies for various reasons, including QI knowledge gaps and improper documentation, hence requiring ongoing monitoring, coaching, and technical assistance. To overcome this limitation, the University of Maryland, Baltimore developed a complimentary digital reporting system for documenting QI activities and monitoring real-time effects on clinical processes and outcomes.

**Methods**
Digital reporting of QI activities involves several steps that are carried out at facilities by QI teams. QI project descriptions and data are captured in the digital web-based QI platform that has both online and offline access. The dashboard shows all QI projects from different facilities and an autogenerated list of the best QI projects. Each facility can access data in real-time to guide program improvement. Further navigation allows for comparison of project performance across facilities, districts, or provinces. Performance for each indicator is color-coded (red, yellow, and green) to inform facilities about their achievements (below average, average, on target) as per their improvement objective(s).

**Results**
Since June 2020, a total of 263 QI projects related to HIV core indicators from 111 facilities have been initiated and tracked using the QI platform. The platform has enhanced targeted technical assistance based on facility performance. The platform allows for collaborative learning of best practices, exchanging information with peers, and tracking progress. Anecdotal evidence has indicated that it has increased work efficiency and has been well accepted by healthcare workers

**Conclusions**
The QI platform has simplified QI tracking and documentation processes. It also motivates facilities to initiate QI projects and is performing optimally for the improvement of HIV services. The QI platform is rapidly scaling up across the country and beyond, including Nigeria, Tanzania, Kenya, Botswana, and Zambia.

# Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

## Oral

### 1544

### Impact of community mobilizers in increasing awareness and demand of HIV self testing (HIVST) in North Central, Nigeria, August 2022.

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Community Mobilizers, HIV, Demand, awareness, private sector

**Introduction**
HIV self-testing (HIVST) offers consumers' confidentiality and convenience to promote self-care. To improve the awareness and demand of HIVST, a community mobilizer model was introduced to strengthen HIV self-testing in the private sector in the communities. This aim to address barriers to HIV self-testing in the private sector among populations at risk and those in hard-to-reach areas.

**Methods**
We conducted a pilot study between February – August 2022 in Abuja, Nigeria through deployment of 10 community mobilizers. Eligible community mobilizers include resident of the community, ability to read and write, good interpersonal and persuasive communication skill. The data from baseline and follow-up surveys were analyzed quantitively through the total number of persons reached through community mobilization, number of persons who made enquiries about HIV self-test kits and the total number of persons who purchased the HIVST from the pharmacies (private sector) in the communities.

**Results**
Our findings showed that the community mobilizers reached a total number of 12,466 persons through small group and one-one interactions. More persons were reached through one-one interactions (6854) than small group interactions (5614), with majority of them being females. Out of 64 pharmacies enlisted for the study, 53 reported that there was notable increase in the number of persons who made enquiries for the HIV test kit

Also, the community mobilizers after educating and counselling referred 3,000 persons in communities to purchase the HIVST kit from the pharmacies out of which 931 persons redeemed the referral by purchasing the test kit from the pharmacies.

**Conclusions**
While there are various barriers observed using the community mobilizers model due to religion, ethnicity, low risk perception and literacy level. The use of the community mobilizers model made a remarkable impact in the community as it helped improve awareness, demand, and uptake of HIV self-test kits in the private sector.

## Poster

### 155

### EFFECTIVENESS OF PARTICIPATORY ACTION RESEARCH TO INCREASE COVERAGE OF MASS DRUG ADMINISTRATION IN BENIN

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
rapid ethnography, participatory action research, MDA, coverage, neglected tropical disease, onchocerciasis

**Introduction**
Onchocerciasis is a neglected tropical disease (NTD) that causes blindness. A primary method used to control onchocerciasis is mass drug administration (MDA), in which entire endemic communities are targeted with treatment. We aimed to determine if engaging communities in the development of effective and feasible implementation strategies will improve MDA treatment coverage in Benin.

**Methods**
This study took place in an intervention and a control commune in Benin, from January 2020 to March 2021. We use rapid ethnography and participatory action research to learn about community member perceptions of onchocerciasis, MDA, and opportunities to increase coverage of MDA. Rapid ethnography findings were shared with NTD Program during a participatory meeting during which we used a structured nominal group technique to derive implementation strategies most likely to increase treatment coverage. These strategies were delivered prior to and during MDA in December 2020, followed by a coverage survey.

**Results**
During rapid ethnography, key barriers to MDA participation included mistrust in community drug distributors, poor penetration of MDA programs into rural or geographically isolated areas, and low demand for MDA amongst specific sub-populations driven by religious or traditional beliefs. Stakeholders co-developed tailored interventions, including drug distributor trainings that included role play, revised community sensitization messages delivered via radio and public criers, mapping and house marking to improve drug distributor route planning and supervision, and increase engagement of supervisors and local leaders. Coverage survey shows that MDA coverage increased by 14% in the intervention commune, relative to the control commune ($p<0.001$).

**Conclusions**
Much of the implementation research conducted in sub-Saharan Africa is implemented in a top-down manner, with both implementation determinants and strategies derived in the global North. This project provided an important opportunity to test the potential of participatory action research that involves both community members and Ministry of Health officials to optimize program delivery.

## 255

## The role of trust between actors in a robust multisectoral epidemic response: Findings from a social science study during COVID-19 and Ebola epidemics in Uganda's western border districts

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
social science; epidemic response; Ebola; COVID-19; Uganda; trust

**Introduction**
A whole-of-society approach to public health emergencies is predicated on trust between government, public health, civil society, community, and the private sector. Whilst mistrust is often cited as a cause of non-cooperation of beneficiaries during epidemic response, less is known about drivers of trust/mistrust. We conducted a study to understand trust in epidemic response, in Uganda during the COVID-19 pandemic and at the end of the DRC Ebola epidemic.

**Methods**
We present findings focusing on drivers of (mis)trust in epidemic response, and lessons learnt for improving a 'whole-of-society' approach. We conducted in-depth interviews (71), 3 power mapping discussions (21) and 15 focus group discussions (t79) in Hoima, Kasese, and Kisoro Districts. We collected data from local government, community residents, traditional healers, and health workers from public and private health facilities and pharmacies during April-May 2021, and adapted our tools and methodology to COVID-19 prevention protocols. Analysis was conducted through an iterative and deductive process using NVIVO software.

**Results**
We identified several drivers of trust and mistrust in epidemic response. We found that trust is dependent on social proximity, effective communication and community engagement, empathy and follow-up. On the other hand, mistrust is driven by fear. For example, the integration of security forces with epidemic response interventions, or when the perception that responders are motivated by money rather than benevolence.

**Conclusions**
This study demonstrates that trust implies a move toward the future that depends on the imaginary anticipation of the imminent. Understanding drivers of mis/trust in epidemic response ensures epidemic response takes into account people's hopes and expectations. We provide recommendations for improving trust for a better 'whole-of-society approach' to epidemic response, with implications for future infectious disease outbreaks and epidemics.

## 540

## Personal barriers to participation in chosen Instrumental Activities of Daily Living among community-dwelling persons with Schizophrenia in Kigali city, Rwanda, October 2021

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Schizophrenia, individual hindrances, personal barriers, instrumental activities of daily living, community participation

**Introduction**
Mental health conditions is a major health concern across the globe. Schizophrenia, being one of the mental health conditions, affect approximately 20 million people globally and 5 million people within the African continent. Persons with schizophrenia experience challenges while participating in instrumental activities of daily living (IADLs) which are essentials in individual's health and wellbeing. The objectives of the study were to explore personal barriers affecting participation in chosen IADLs among community-dwelling persons with schizophrenia and to identify IADLs affected as a result of personal barriers among community-

dwelling persons with schizophrenia living in Kigali, Rwanda.

**Methods**
A qualitative, embedded case study design and constructivist epistemology paradigm were used. Purposive sampling respecting selection criteria and semi-structured interviews were conducted for twenty participants including ten persons diagnosed with schizophrenia (case 1) and their ten caregivers (case 2). Data were analyzed according to the seven steps of Ziebland and Mcpherson.

**Results**
This abstract reported a theme named individual hindrances to participation which revealed limited knowledge and skills, decreased motivation and interest, financial problems, maladaptive behaviours, medication side effects, loss of social interaction and isolation, and disorganised in performing activities to negatively affect persons with schizophrenia's full participation in their chosen IADLs. The affected IADLs stated by the persons with schizophrenia and their caregivers include taking medication, food preparation, use of phone, financial management, household activities, religious and spiritual activities.

**Conclusions**
Community-dwelling persons with schizophrenia are experiencing various hindrances to participating in their chosen IADLs which showed a need for support from different stakeholders both governmental, non-governmental institutions and community members to improve access and participation of persons with schizophrenia in their daily activities based on their abilities. The study recommended research to investigate appropriate strategies to overcome identified barriers and improve the participation of persons with schizophrenia in their everyday activities and overall wellbeing.

## 649

## Multisectoral approach to addressing gender-based violence in Migori County, Kenya, 2020

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Gender Based Violence, Girls and Young Women, Multi-sectoral Approach, Harmful Practices, Teenage Pregnancy

**Introduction**
Many young people in Kenya including adolescents, girls and young women (GYW) are subjected to harmful, cruel, inhumane, and degrading practices that are steeped in culture and traditional practices. These includes female genital mutilation, child marriage and wife inheritance that contribute to many public health consequences including high rates of teenage pregnancies, unsafe abortions, maternal mortalities, sexual and gender-based violence and spread of HIV/AIDS. GYW in Migori are among the most affected in Kenya.

**Methods**
The County Government of Migori collaborated with civil society, national government departments including security, education, health, youth and gender, development partners including United Nations Agencies, community leaders and youth led organizations to develop a taskforce to address gender-based violence and its drivers. The taskforce jointly developed the Migori County Sexual and Gender Based Violence Policy 2020 which established a multisectoral mechanism for coordination and partnership. NAYA supported the County to develop an online reporting tool on Kobo where all partners could report on.

**Results**
The County Data indicates that reporting on GBV by the county and partners increased to 99% as per the Ministry of Health Form 711 that tracks reproductive health and HIV/AIDS data as well as through the County Multisectoral Reporting Platform on Kobo. The total number of persons who accessed SGBV services increased by more than 50% from 931 in 2020/2021 to 1406 in 2021/2022

financial year. This was due to increased reporting of cases and referral by partners. The online reporting tool has also empowered the taskforce to make informed policy decisions and adjust strategy accordingly.

**Conclusions**
Public health concerns that are deeply entrenched in culture and beliefs require the meaningful and inclusive engagement of all the key actors including government, non-state actors, community, and those most affected to work together in research, advocacy, policy making, monitoring and evaluation and peer accountability.

## 684

## Community-Based Misinformation Fact Checking in Niger State, Nigeria, August 2022

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Community engagement, health misinformation, community health watch, social and behaviour change

**Introduction**
Recent spread of misinformation during public health emergencies has underscored the importance of effective risk communications and community engagement in public health response, critical for ensuring adherence.

Nigeria Health Watch conducted a mixed methods study to determine prevalent health misinformation in Niger State, with the aim of establishing a data collection mechanism that is community informed, to develop evidence-based fact-checks of rumours and misinformation for dissemination in the relevant communities.

**Methods**
A mixed methods study was conducted in rural communities across 8 Local Government Areas (LGAs) in Niger State, Nigeria. Quantitative and qualitative data were collected by trained community members, using simplified, interviewer-administered questionnaires. Sample size for the quantitative survey was determined at 419, using the Leslie Kish formula. Forty-eight interviews were conducted with youth, community, and religious leaders, and primary healthcare workers. Data collection was done using ODK and analysed with SPSS, while qualitative data were analysed using NVivo.

**Results**
More than half (55%) of the respondents seek healthcare in the local clinic and 25% at the local chemist; 58% and 22% get their health information at the health facility and Radio/Television respectively. Overall, 43% of respondents were informed, 39% were misinformed and 18% were uninformed - about gender equality and sexual and reproductive health (SRH). Misinformation was higher in SRH (55%), water, sanitation, and hygiene (54%), and nutrition (48%) thematic areas. Respondents were most informed about routine immunization (69%), infectious diseases (51%), and mental health (51%). An additional finding that came out strongly from qualitative interviews was the common use of herbal medications to treat illnesses, sometimes prescribed by healthcare workers.

**Conclusions**
There is a need to fact-check health misinformation around identified public health thematic areas, taking into consideration areas where knowledge gaps/information voids persist and the communities' sources of health information. Health misinformation fact-checking must essentially include healthcare workers.

## 901

## A Whole School Approach: Sustainable Implementation of Comprehensive Sexuality Education in Nairobi County, September 2020

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Sustainability, stakeholders, generate evidence, Comprehensive Sexuality Education

**Introduction**
Young people are growing up with numerous reproductive health problems and rights violations. Comprehensive Sexuality Education (CSE) can significantly contribute towards addressing some of these issues. CSA implemented CSE through the Whole school approach (WSA). This means that the schools were the key players in the programme, linking with all stakeholders involved, such as teachers, students, parents, communities, Youth Friendly Services, and the Ministry of Education. The rationale behind upscaling WSA was to reach more beneficiaries at appropriate age, documentation of lessons learned and generate evidence for sustainable implementation of CSE.

**Methods**
A multi-sectoral quasi experimental intervention design was utilized. The interventions targeted Form one learners in 5 secondary schools. Data collection approaches included: observation checklist, student questionnaire, FGDs and Self assessments. The Qualitative data was coded in line with the 5 thematic areas i.e. Management actively supports Adolescent Sexual Reproductive Health and Rights (ASRHR) education in the school, Access to ASRHR information & services, Parent/ community involvement, Adequate ASRHR teaching capacity and a Healthy and safe school environment, and Quantitative data was analysed using proportions.

**Results**
All schools have allocated time for CSE lessons for sustainability of the program. Students received SRHR information from both parents and teachers (55% - parents from 20% and 45% - Teachers from 19%). There is strong/improved link between schools and health facilities. Teachers feel confident in handling sensitive SRH issues. 80% of students reported that they feel safe as school code of conduct created with involvement from students and other stakeholders. Allocation of budget for sustainability within the schools still a challenge.

**Conclusions**
There is need to involve all stakeholders in the school community for sustainable CSE program. There is also a need to have a healthy and safe school environment to ensure what is taught to students in class is not nullified by school environment.

## 1196

## L'IMPLICATION DE LA SOCIETE CIVILE DANS L'ATTEINTE DES OBJECTIFS DE DEVELOPPEMENT DURABLE : UNE COALITION D'ORGANISATIONS DE LA SOCIETE CIVILE POUR DIRE NON AUX MALADIES TROPICALES NEGLIGEES – INITIATIVE DE SPEAK UP AFRICA, AU BENIN, AU BURKINA FASO , EN GUINEE , AU NIGER , ET AU SÉNÉGAL (2019-2022)

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Coalition ; MTN ; OSC ; plaidoyer

**Introduction**
Selon l'OMS, quarante-sept pays africains sur cinquante-cinq sont endémiques à au moins une

maladie tropicale négligée (MTN). L'implication des acteurs de la société civile pour une lutte efficace contre les MTN est plus qu'urgente au regard de leur ancrage communautaire et constitue une des composantes des soins de santé primaires.

En quoi la mise en place d'une coalition d'organisation de la société civile (OSC) contribuerait à la lutte contre les MTN ?

**Methods**
Grâce au financement de l'organisation Speak Up Africa, depuis 2019, onze OSC du Burkina Faso, de la Guinée, du Niger et du Sénégal se sont réunies à travers une coalition dénommée « Les organisations de la société civile disent Non aux MTN » afin de renforcer le plaidoyer au niveau régional et impliquer les décideurs pour un soutien politique et financier en faveur des programmes de contrôle et d'élimination des MTN.

**Results**
Ces OSC ont soutenu des activités de plaidoyer et démontré leurs capacités à engager le secteur privé et la communauté en vue d'appuyer les programmes nationaux de lutte contre les MTN et le paludisme, à travers ces actions :

Institutionnalisation de la coalition multisectorielle de lutte contre les MTN en Guinée et au Niger par arrêté ministériel étant le signal d'un engagement politique.

Orientation de 25 parlementaires et de cadres du ministère de la Santé sur le financement des MTN au Niger

Intégration des données et des revues semestrielles MTN-Paludisme, respectivement en Guinée et au Sénégal, résultat d'un fort plaidoyer

Mise en place d'une campagne régionale dénommée « En Marche vers Kigali » (MTK), par neuf OSC

Signature de l'appel à l'action par plus de 300 OSC et médias africains, et campagne de communication

**Conclusions**
Cette dynamique atteste du pouvoir des OSC à engager les parties prenantes sur des questions de santé.

## 1205

## Accelerating community-level COVID-19 vaccine uptake through engaging traditional, religious and other community leaders: A review of Malawi EMPOWER Program Data

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Vaccine Uptake, Demand Generation, Community Leaders, Partnerships

**Introduction**
In 2021, the USAID-funded EMPOWER project began supporting vaccine uptake, demand generation efforts, and community health workers with District Health Offices in the Zomba and Machinga districts in Malawi. The project prioritized demand generation at the community level and supported community health surveillance assistants with vaccination efforts at local health facilities with key populations. In 2022, the project conducted focus group discussions with community and religious leaders to understand barriers and opportunities to increase district-level vaccine uptake.

**Methods**
Over the course of 2021 and 2022, the project conducted interviews with 146 community and religious leaders to disseminate vaccine information, address misconceptions, and discuss

barriers to vaccine uptake. Community leaders developed a multi-step action plan to address vaccine hesitancy, placing vaccine sites near populations, identifying community COVID-19 champions, developing and translating vaccine talking points, using peer-to-peer mobilization. Planned activities were rolled out at the community level with support from health surveillance assistants.

**Results**
Results from this review found that engaging community and religious leaders built trust within the community, changed attitudes toward vaccine safety, effectiveness, and delivery, and ultimately improved COVID-19 vaccine uptake. Since the inception of the project, uptake of the COVID-19 vaccine in Malawi's Zomba and Machinga districts increased from 238 doses administered in FY21 (Q3 and Q4) to 7,371 doses in FY22 (Q1 through Q3). This community-level engagement resulted in 70% of doses allocated to the Zomba and Machinga districts to be administered.

**Conclusions**
In order to successfully implement COVID-19 vaccination programs at scale, community and religious leaders must be engaged and involved in health programming. Partnerships with influential stakeholders, like religious and community leaders, are key to building trust with communities and advocating for a change in perception of and attitude toward the COVID-19 vaccine.

## 1236

## Using community commitment to overcome vaccine reluctance and resistance in Moyen-Mono Health district, Togo, 2022

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
vaccine hesitancy, community, commitment, Moyen-Mono

**Introduction**
Vaccine hesitancy is a public health problem, threatening african healthcare systems to meet up with vaccination goals, exposing communities to preventable outbreaks. In the context of covid-19 this hesitancy, usual in Moyen-Mono district, has worsened and is one of the leading causes of the decline in DTP3 coverage from 90.1% in 2021 to 75.4% in 2022 for the first semester. We aim to describe the best practice of community commitment to address vaccine hesitancy.

**Methods**
We initiated in January 2022, a consultation framework between health workers and community leaders. They were briefed on the cases of vaccine hesitancy and their consequences on the district immunization coverage, and they commit to support health workers. A stepwise approach of handling hesitancy cases was designed using either explanation, confidence building, negotiation, persuasion. From the common local influencers to the Prefect were involved in this strategy. Depending on the profile of the person reluctant to vaccination, the Prefect can be immediately involved to ask district level NGOs interventions. In order to prevent hesitancy in routine immunization, series of community dialog were initiated and conducted by community leaders.

**Results**
A total of 25 cases of vaccine hesitancy due in most of the cases (36%) to fathers non-authorization, were reported during the first semester 2022. Three community leaders (12.0%) were authors of refusals. Among the 94 children to catch up, 15 (15.9%) were zero doses and 68 (72.3%) were able to be vaccinated with community commitment. The most used approach to overcome hesitancy was negotiation in 60% (15/25) of the cases by the combined mediation of traditional Chiefs and local

influencers. Community commitment was not able to solve 7 (28.0%) cases of vaccine hesitancy.

**Conclusions**
Community commitment is useful to reach immunization target and have to be well designed and strategized.

## 1523

## Co-creation of community-based interventions to break barriers in access to effective malaria treatment among conflict-affected communities in the South West and Littoral Regions of Cameroon

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**Conference Track**
Track 7: Whole-of-society – the power of engaging civil society, community actors, and the private sector

**Keywords**
Co-creation, Community-based, Malaria, Civil society, Conflict-affected, Cameroon

**Introduction**
Collaborating with stakeholders to develop interventions tailored to fit unique circumstances is proposed as a way to improve the relevance and usefulness of community-based approaches. This study used a context-specific driven approach to develop malaria demand and supply services to break barriers in access to effective malaria case management in conflict-affected communities of the South West and Littoral Regions of Cameroon.

**Methods**
Between May 2021 and December 2021, three phases of activities were used to develop interventions to improve the quality of malaria care; 1) community need assessment based on data obtained from household surveys, focus group discussions and in-depth interviews, 2) dissemination of findings on community's perceptions, practices, beliefs and malaria health seeking behavior to stakeholders comprising of community members, health administrators within the National Malaria Control Programme, civil societies and malaria researchers and obtaining their feedbacks, 3) collaboration with community stakeholders, civil society organization, and health workers and administrators in the design and co-development of community-based malaria case management approach during a co-creation workshop.

**Results**
The community assessment identified gaps in the demand for malaria treatment from the local population that guided the selection and design of a community health participatory approach. Barriers to the uptake of malaria services emerged to be tackled through health vouchers for free treatment of simple malaria at the community level provided by Community Health Workers (CHWs), and severe malaria among under-five years children at health facilities. The quality delivery of malaria services was targeted to be improved through monthly supportive supervision of CHWs by Civil Society Organizations and quarterly by health personnel.

**Conclusions**
Co-creation led to innovative community-based engagement approaches to increase the community's knowledge of malaria prevention and break barriers in access to effective malaria care. Innovative interventions targeted at complementing existing structures whose functionalities have been affected by armed conflict were designed.

## Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

## Oral

### 701

### Rifampicin-resistant tuberculosis control in Rwanda overcomes a successful clone that causes most diseases over a quarter century

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Tuberculosis in Rwanda, Rifampicin-resistant tuberculosis control, Universal drug-susceptibility testing, Mycobacterium tuberculosis transmission

**Introduction**
Rifampicin-resistant (RR) tuberculosis (TB) poses an important challenge in TB management and control. We investigated the RR-TB clustering rates, bacterial population dynamics to infer transmission dynamics, and the impact of changes to patient management on these dynamics over 27 years in Rwanda.

**Methods**
We analyzed whole genome sequences of a longitudinal collection of nationwide RR-TB isolates. The collection covered three important periods: before the programmatic management of MDR-TB (PMDT; 1991–2005), the early PMDT phase (2006–2013), and the consolidated PMDT phase (2014–2018). We used Bayesian modeling for dating and population size estimations and TransPhylo to estimate the number of secondary cases infected by each patient.

**Results**
Of 308 baseline RR-TB isolates considered, a single dominant clone was discovered containing 213 isolates (82.2% of clustered and 69.1% of all RR-TB included), which we named the "Rwanda Rifampicin-Resistant clone" (R3clone). R3clone isolates belonged to Ugandan sub-lineage 4.6.1.2 and its rifampicin and isoniazid resistance were conferred by the Ser450Leu mutation in rpoB and Ser315Thr in katG genes, respectively. The R3clone was estimated to first arise in 1987 and its population size increased exponentially through the 1990s', reaching maximum size (~84%) in the early 2000 s', with a declining trend since 2014. We showed that patients with R3clone detected after an unsuccessful category 2 treatment were more likely to generate secondary cases than patients

with R3clone detected after an unsuccessful category 1 treatment regimen.

**Conclusions**
RR-TB in Rwanda is largely transmitted. Xpert MTB/RIF assay as the first diagnostic test avoids unnecessary rounds of rifampicin-based TB treatment, thus preventing ongoing transmission of the dominant R3clone. As PMDT was intensified and all TB patients accessed rifampicin-resistance testing, the nationwide R3clone burden declined. To our knowledge, our findings provide the first evidence supporting the impact of universal DST on the transmission of RR-TB.

## 798

## Cross-reactivity of P. falciparum antigens Pf27, Pf43, Pf45 with their orthologs Pv27, Pv43, Pv45 of P. vivax to sera from donors living in Kenieroba, Mali

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Cross-reactivity, P. falciparum, P. vivax, Adults, Children, Mali

**Introduction**
Antigenic polymorphism of P.falciparum represents a major challenge for the development of an effective malaria vaccine. Bioinformatics tools remains a realistic approach to identify new antigens that can be used as potential vaccine candidates. In addition, the presence of homologies between P.falciparum and P.vivax proteins offers the prospect to develop multi-species and cross-protective vaccines.

Objectives: To study the seroreactivity of P.falciparum antigens Pf27, Pf43 and Pf45 and their P.vivax orthologues to the sera of volunteers living in Kenieroba

Research question: What is the degree of cross-reactivity between the P.falciparum antigens Pf27, Pf43, Pf45 with their P.vivax orthologues in a P.falciparum endemic area?

**Methods**
Scientific collaboration between USTTB and the University of Lausanne on a research project aimed at identifying a potential vaccine candidate against both P.falciparum and P.vivax.

Children (n = 41) and adults (n = 48) of Kenieroba, a P.falciparum endemic area. .

Reside in Kenieroba, be between 18-65 years old for adults and 4-5 years old for children, give free and informed consent, have a hemoglobin level ≥ 8g/dl.

Microsoft Excel 2010, STATA version 14, Prism 9.

**Results**
The seroprevalence for Pv27 was 42.7% vs. 29.2% for Pf27; 12.4% for Pf43 vs. 6.7% for Pv43, and 13.5% for Pv45 vs. 11.2% for Pf45. Seropositivity to Pf27 (56.1%, $p = 0.0001$), Pv27 (87.8%, $p = 0.0001$), Pv45 (29.3%, $p = 0.0001$) was significantly higher in children. A significant correlation was found between antibodies against P.falciparum antigens with their P.vivax orthologs in both children and adult sera ($p < 0.05$). The antibodies titers to Pf43 ($p = 0.0001$), Pv43 ($p = 0.0002$), Pf45 ($p = 0.001$) and Pv45 ($p = 0.0001$) were significantly higher in adults. Sera from children and adult donors reacted well to the couple Pf27/Pv27.

**Conclusions**
The high seroprevalence suggests existence of cross-reactivity between P.falciparum antigens and their orthologs P.vivax that should be tested as potential vaccine candidates.

## 1022

## Investigation of Human Tungiasis Cases, Sheema District, Uganda, November 2021 to February 2022

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Tungiasis, Jiggers, Investigation, Uganda

**Introduction**
No formal surveillance system exists in Uganda for tungiasis, and outbreaks are frequently reported through media. On 27 January 2022, a news alert reported a jiggers (tungiasis) outbreak in Sheema District, Southwestern Uganda. We investigated to establish the magnitude of the problem and identify possible exposures associated with infestation to inform control measures.

**Methods**
We defined a confirmed case as visible Tunga penetrans in the skin of a resident of any of the 6 affected villages in Bwayegamba Parish in February 2022. A suspected case was self-reported T. penetrans infestation during three months preceding the interview. We visited all households in the 3 most affected villages to identify cases and conduct interviews. We assessed social-economic status, house construction, mitigation measures against jiggers, and observed participants (feet, clothes, nails, walking barefooted) and their compounds for hygiene. A 'yes' response to any one hygiene variable was considered 'poor hygiene'. We conducted one case-control study comparing case-households (with ≥1 case) with control-households (without any cases), and one comparing individual cases (suspected and confirmed) to neighbourhood controls.

**Results**
Among 278 households, we identified 60 cases, among whom 34 (57%) were male. Kiyungu West was the most affected village (attack rate=31/1,000). Cases had higher odds of being male (ORMH=2.3, 95%CI=1.3-4.0), <20 years of age (ORMH=2.0, 95%CI=1.1-3.6), unmarried (ORMH=2.97, 95%CI=1.7-5.2), unemployed (ORMH=3.28, 95%CI=1.8-5.8) and having poor personal hygiene (ORMH=3.73, 95%CI=2.0-7.4) than controls. In the household case-control study, case-households had higher odds of having dirty or littered compounds (ORMH=2.3, 95%CI=1.2-4.6) and lower odds of practicing mitigation measures against jiggers (ORMH=0.33, 95%CI=0.1-0.8) than control-households.

**Conclusions**
Males, unemployed persons, and poor personal or household hygiene increased odds of tungiasis in this outbreak. Multi-sectoral, tailored interventions that improve standards of living could reduce risk of tungiasis in this area. Adding tungiasis to national surveillance reporting tools could facilitate early identification of future outbreaks.

## 1254

## Situation Analysis of Nutrition Status of People Living with HIV in Rwanda

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**Conference Track**
Track 2: Increasing local production in Africa: Advocacy, Research and Development Capacity in Diagnostics, Therapeutics and Vaccine Manufacturing

**Keywords**
Malnutrition, HIV, UNAIDS

**Introduction**
Malnutrition and HIV overlap as each condition adversely affects the other. HIV disease could lead to malnutrition directly or indirectly, and in turn, malnutrition could contribute to an increased risk of advanced HIV diseases. There is a scarcity of data on the nutrition status of people living with HIV in Rwanda. Therefore, this study aimed to determine the nutrition status of PLHIV in Rwanda.

**Methods**
A Cross-sectional cluster sampling technique was employed to measure the anthropometric parameters of 2,488 ART clients. A standard questionnaire was used to assess the demographic and other clinical characteristics of the participants. ART clients aged 20 years and above in 60 randomly selected health centers from 30 districts participated in the study. Ubudehe categories were used to assess the wealth of participants.

**Results**
The total of 2488 participants; 45.6% were in ubudehe category2,26.4% were in category 1, 27.9% in category 3, and 0.1% were in category 4. 73.9% have attended the school of which 69.6% have completed the primary level. 42% were self-employed and 29.3% were casual workers. 25.60% of participants were followed in the TB program. 48.11% had more than 10 years in the program while 32.36% had 5-10 years and 15.51% had 1-4 years. Of patients on ART, 10.93% of participants missed at least one or more doses within 30 days preceding the survey. 18.1% were underweight, 60.1% fell within the normal range 13.9% were overweight and 7.1% were obese.

**Conclusions**
Our findings showed the current nutrition status among PLHIV was precarious as it potentially leads to poor clinical outcomes. That, in turn, is a potential barrier to achieving and maintaining the UNAIDS epidemic control targets in Rwanda. Hence, nutrition programs should be reinforced in HIV services to alleviate the negative outcome of poor nutrition among PLHIV.

## 1555

# Testagem de caso índice em Angola contribui para aumentar a identificação de casos de VIH, Luanda, 2020.

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
VIH, Caso Índice, Angola, Busca Activa e Conselheiro comunitário

**Introduction**
Em 2016, Angola iniciou o processo de padronização e testagem, como uma nova estratégia para melhorar a cobertura de rastreio, identificação e testagem de parceiros e filhos de pessoas vivendo com VIH (PVVIH). Esta estratégia denominada Busca Activa Consentida Através do Caso Índice (BACCI) foi institucionalizada e propôs a implementação da abordagem a nível nacional, após a apresentação deste estudo piloto.

**Methods**
O BACCI, tem como objectivo identificação de contactos das PVVIH através dos quais estas possam ter sido infectadas pelo VIH ou a quem possam ter transmitido. Os contactos incluem parceiros sexuais e filhos. Estes contactos são rastreados e contactados, sendo-lhes oferecidos o teste de VIH, aconselhamento, acesso a prevenção e tratamento antirretroviral. São também aplicadas medidas preventivas para assegurar que as pessoas com resultado negativo continuem seronegativas.

**Results**
Entre Outubro de 2016 e Março de 2019, foram realizados 173.251 testes de VIH nas unidades de saúde, em Luanda, dos quais 12.924 com resultado positivo (7,5%). A taxa de positividade dos testes realizados por meio de aconselhamento e testagem (AT) foi de 13,0% e 4,9% em outros pontos

de testagem. O BACCI produziu os melhores resultados: Dos 4.223 casos índice, foram testados 5.673 contactos, destes 1.483 tiveram resultado positivo, 1 produzindo uma taxa de seropositividade de 26,1%.

**Conclusions**
Com um rendimento mais de duas vezes maior do que as estratégias tradicionais de testagem, o BACCI é uma estratégia bem-sucedida para a identificação de casos VIH+. O BACCI, deve ser priorizado, pois é uma estratégia chave para aumentar o diagnóstico precoce de PVVIH e acelerar avanços no controlo epidémico.

## Poster

### 37

### GENETIC DIVERSITY OF HIV-1 AND ITS EFFECT ON THE RESIDUAL RISK OF INFECTION IN THE GABON TRANSFUSIONAL SETTINGS

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Keywords: HIV-1, blood transfusion, residual risk, genetic diversity, resistance mutations, Gabon

**Introduction**
Context: The transmission of viruses during blood transfusion is a major public health problem that threatens transfusion safety, nearly 5 to 10% of HIV infections in Africa are transmitted by blood transfusion. In Gabon, the current donation screening strategy does not allow better discrimination of HIV-1. The objectives were to: 1) Estimate the residual risk at the National Blood Transfusion Center of Gabon, 2) Characterize the viral genotypes in manifest and residual infection and 3) Determine the threshold for the transmission of major resistance mutations in naïve donors

**Methods**
Material and methods: An analytical cross-sectional study was conducted from June 2020 to September 2021 among 381 donors from the NBTC in Gabon. Sampling was convenient and the plasma was obtained in EDTA tubes. ELISA (4th generation) and chemiluminescence techniques were performed at the NBTC for the detection of anti-HIV1/2 antibodies and p24 antigen. Molecular techniques (Real-time PCR, sequencing, and molecular phylogeny) were carried out at CBIRC. The data was analyzed by SPSS and EPI info. Graphs were drawn using Microsoft Excel 2016.

**Results**
Results: The residual risk was 648 per 1,000,000 donations. The prevalence of residual infection was 1.4%. The strains identified were A1 (18.8%), F2 (6.2%), G (12.5%), CRF02_AG (50%) and CRF45_cpx (12.5%). The transmission threshold for resistance mutations was 25% (4/16) (K103N, E138G, L210W, and M46L). HIV-1 strains had no significant effect on residual risk (P = 0.30).

**Conclusions**
Conclusion: The residual risk remains a concern, requiring a strengthening of the screening strategy for donors at risk. In addition, this transmission is accompanied by a considerable risk of transmitting HIV-1 resistance mutations to antiretrovirals to the recipient.

### 271

### Determinants of sexually transmitted infections in female sex workers: Findings from a biobehavioral study data count model analysis

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Female sex workers, sexually transmitted infections, count model analysis

**Introduction**
Sexually Transmitted Infections (STIs) remain a major public health problem worldwide, the burden of these infections is high among female sex workers (FSWs) who are often not aware of their infection status. This study aimed to determine the factors that are associated with the numbers of STIs among FSWs in Ethiopia.

**Methods**
A cross-sectional bio-behavioral study involving respondent-driven sampling (RDS) was conducted among 6085 FSWs in sixteen towns in Ethiopia. Hurdle Poisson was performed by using STATA Version 16.2. The incident rate ratio and odds ratio with a 95% confidence interval was used to show the strength and direction of the association. A P-value of less than 0.05 was used as a threshold for statistical significance.

**Results**
At least one STI was identified in 1444 (23.73%) of the FSWs. Age group 35-49 years [IRR=2.32; 95% CI (1.43, 3.74)], forced first sex [IRR=1.32; 95% CI (1.01, 1.74)], condom breakage (IRR=1.32; 95% CI (1.01, 1.74)], and a history of depression [IRR=1.55; 95% CI (1.12, 2.18)] increases the number of STI. FSWs aged 25-34 years [AOR=2.99; % CI (2.54, 3.52)] and 35=59 years [AOR=8.05; % CI (6.54, 9.91)], who were selling sex for 5-10 years [AOR1.30; 95% CI (1.1, 1.55)] and above 11 years [AOR=1.21; 95% CI (1.03, 1.43)] were more likely to get STIs.

**Conclusions**
STIs are common in Ethiopia and age, educational status, monthly income, condom failure, age at first sexual encounter, and long duration of sexual practice are independent predictors of STIs. Health interventions among FSWs need to include awareness generation about prevention and control of STIs and address the determinants identified in this analysis

## 281

## Fast-Track strategy to end the AIDS epidemic by 2030: Perspectives of People living with HIV on the Undetectable equals Untransmissible phenomenon and general HIV service provision in selected health facilities in Rwanda

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Viral load suppression; Undetectable, Untransmissible, HIV transmission.

**Introduction**
Rwanda has made substantial achievements in the scale-up of HIV testing and treatment services. In 2018, 83.8% of people living with HIV (PLWH) were aware of their status, 97% of those who were aware were on antiretroviral therapy (ART) while 91% of those on ART were virally suppressed. Several studies have shown that PLWH who have an undetectable viral load do not transmit HIV infection to their sexual partners and babies, Undetectable =Untransmissible (U=U). This study aimed to investigate perspectives of PLWH on the U=U phenomenon and HIV service provision in selected health facilities in Rwanda.

**Methods**
This study was a cross-sectional qualitative study, which collected data in three purposively selected health facilities in Rwanda from May 1-30, 2022. We reached data saturation after enrolling 43 PLWH. Conventional thematic analysis was employed to analyze the data.

**Results**
The majority of study participants revealed that they have good knowledge of HIV transmission, and the U=U message was highly perceived in discordant couples and people who have been on treatment for over 10 years than in any other groups. Four themes emerged from the data analysis. Theme one indicated that there is a good knowledge of HIV transmission among PLWH. Theme two revealed the reasons for disclosing HIV status and linkage to care. Theme three revealed the reasons for the acceptability of the U=U phenomenon and the last emerged on the common challenges PLWH are facing ARVs clinics which might impact viral load suppression.

**Conclusions**
Our findings underscore the need for wider dissemination of U=U messaging to all PLWH subpopulations. Further, studies that inform a better understanding of the constraints of PLWH remain critical to the achievement of the UNAIDS target for ending the HIV/AIDS epidemic by 2030.

## 283

## HIV prevalence and associated risk factors among young gay, bisexual and other men who have sex with men in Nairobi, Kenya, February 2021: a respondent-driven sampling survey

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Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
college/university students, HIV prevalence, respondent-driven sampling (RDS), risk factors, young gay, bisexual and other men who have sex with men (YMSM)

**Introduction**
Young gay, bisexual and other men who have sex with men (YMSM), are a key population at heightened risk of human immunodeficiency virus (HIV) infection, yet they are underrepresented in research. We conducted a bio-behavioral survey to estimate HIV prevalence and associated risk factors among YMSM in Nairobi, Kenya.

**Methods**
In February 2021, 248 YMSM who were students from tertiary academic institutions in Nairobi, Kenya, aged ≥18 years and reported sex with another man in the past year participated in a respondent-driven sampling (RDS) based cross-sectional survey. Participants self-completed a behavioral survey on REDCap digital platform, provided blood samples for HIV and syphilis testing, and urine, anorectal and oropharyngeal swabs for pooled testing of four curable sexually transmitted infections using a multiplex nucleic acid amplification test. RDS-Analyst v.0.72 and Stata v.15 software were used to analyze data. Differences in proportions were examined using chi-square (X2) test, and unweighted multivariate logistic regression subsequently used to assess factors associated with HIV prevalence.

**Results**
Unweighted and RDS-weighted HIV prevalence was 22/248 (8.9%) and 3.6% (95 % CI: 1.3% - 6.0%), respectively. Median age of participants was 21 years (interquartile range 20-22). HIV infection was associated with studying in private institutions (adjusted odds ratio/AOR=6.0; 95% CI: 1.2-30.0, p=0.027), preferring a sex partner of any age – younger, same or older (AOR=5.2; 95 CI: 1.1-25.2, p=0.041), last sex partner being >25 years (AOR=6.4; 95% CI: 1.2-34.6, p=0.030), meeting the last sex partner online (AOR=4.2; 95% CI; 1.1-17.0, p=0.043)

and testing positive for gonorrhea (AOR=7.8; 95% CI: 2.0-29.9, p=0.003).

**Conclusions**
HIV prevalence among YMSM in Nairobi is alarmingly high, demonstrating a need for urgent and tailored prevention and control interventions. Sensitization and training to help healthcare providers working in tertiary academic institutions respond to the health needs of YMSM and other key populations, is planned to take place in January 2023.

## 289

## Transmission of trypanosomiasis by tsetse flies in three active Human African Trypanosomiasis of the Republic of Congo

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Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
transmission, tsetse flies, HAT, Republic of Congo

**Introduction**
Human African Trypanosomiasis (HAT) is a neglected tropical disease still endemic in the Republic of Congo. Despite continuous detection of HAT cases in the country, there is still not enough data on trypanosome infections in tsetse flies, trypanosome species and tsetse flies species distribution in endemic foci. The present study is intended to fill this gap and improve understanding on trypanosome circulation in three active foci in the centre and south of Congo.

**Methods**
Pyramid traps were set in various places in villages to collect tsetse flies both during rainy and dry season. Once collected, tsetse flies were identified using morphological keys. DNA extracted was processed by PCR for species identification and for detection of trypanosome.

**Results**
A total of 1291 tsetse flies were collected. The average apparent density of fly per day was 0.043 in Mpouya, 0.73 in Ngabé and 2.79 in Loudima. Glossina fuscipes quazensis was the predominant tsetse fly found in Ngabé and Mpouya, while Glossina palpalis palpalis was the only tsetse fly found in Loudima. A total of 224 (17.7%) flies were detected infected by trypanosomes; 100 (7.91%) by Trypanosoma congolense savannah, 22 (1.74%) by Trypanosoma congolense forest, 15 (1.19%) by Trypanosoma vivax, 83 (6.56%) by Trypanosoma brucei (s.l.) and 2 (0.16%) undetermined species. A total of 57 co-infections between T. brucei (s.l.) and T. congolense savannah or T. brucei (s.l.) and T. congolense forest were found only in G. p. palpalis. Loudima recorded the highest number of infected tsetse flies.

**Conclusions**
The study provided updated information on the dynamics of tsetse fly populations as well as on the transmission of trypanosome species in the different active HAT foci in Congo. The data suggest high transmission of animal trypanosomes and possibly human trypanosomes in these foci. The study stress the need for active surveillance in these endemic foci.

## 297

## SEASONAL VARIATION OF MICROBIOTA COMPOSITION IN ANOPHELES GAMBIAE AND ANOPHELES COLUZZII IN TWO DIFFERENT ECO-GEOGRAPHICAL LOCALITIES IN CAMEROON

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**Keywords**
Mosquito, microbiota, Anopheles, Seasonality, 16S rRNA gene amplicon sequencing

**Introduction**
Malaria control relies mainly on insecticide-based tools. The effectiveness of these tools is threatened by the widespread insecticide resistance in malaria vectors highlighting the need for alternative control approaches. Mosquitos' microbiota emerged as a promising candidate for paratransgenic control of malaria. However, understanding the factors affecting the bacterial composition in malaria vectors could help inform the design of novel vector control interventions, such as paratransgenesis. This study evaluated seasonal and geographical variations in the microbial community of the two major malaria vectors.

**Methods**
Adult Anopheles mosquitoes were collected across two different eco-geographical settings in Cameroon (Gounougou and Bankeng), during the dry and wet seasons. DNA was extracted from the whole individual mosquitoes from each group and processed for microbial analysis using Illumina Miseq sequencing of the V3-V4 region of 16S rRNA gene. Data analysis was performed using QIIME2 and R software programs.

**Results**
A total of 1985 mosquitoes were collected and among them, 120 were selected randomly corresponding to 30 mosquitoes per season and locality. Overall, 97 bacterial taxa were detected across all mosquito samples, with 86 of these shared between dry and wet seasons in both localities and species. There were significant differences in bacterial composition between both seasons, with a clear separation observed between the dry and wet seasons (PERMANOVA comparisons of beta diversity, Pseudo-F = 10.45; q-value = 0.01). In addition, this study provides evidence of the presence of four potential bacteria symbionts that can be used to develop novel approaches for mosquito control.

**Conclusions**
This study provides evidence that, the seasons were significantly affecting both the bacterial composition and relative abundance of the bacterial genera with more microbial diversity in the dry season in both species collected from two different localities. Further studies will evaluate the suitability of these bacteria symbionts as candidates for paratransgenesis.

## 305

## Long-lasting insecticidal nets ownership and malaria morbidity in the Krachi East Municipality, Ghana, October 2021

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**Conference Track**
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**Keywords**
Malaria, LLINs, Morbidity, Krachi East

**Introduction**
Malaria-related morbidity and mortality are public health problems particularly in Sub-Saharan Africa where women of reproductive age and children are most at risk with severe signs and symptoms.

Millions of people, especially children, and pregnant women suffer severely from malaria and malaria related complications. Long-lasting insecticides nets remain the highest intervention scaled out in Ghana. Given the evidence of resistance to the active component in the LLINs and the constant count of millions of cases of malaria in Ghana, the necessity of this study to identify the levels of ownership and usage of the treated bed nets, and describe the relationship between ownership of LLINs and malaria morbidity.

**Methods**
The 30-cluster sampling method in a quantitative design was deployed. Using both a modified WHO EPI survey method for more rural areas and a random walk sampling for more urban areas, each community had a listed starting point where the use of a spun pen determined the direction to conduct the surveys within the specified cluster. 297 selected households' heads/representatives were interviewed after consenting. Data was cleaned and analysed in stata version 16.0

**Results**
Findings revealed high levels of ownership of LLINs (73.4%) but moderately low usage levels (49.5%). Malaria morbidity (59.6%) was also determined. Multivariate analysis results revealed statistically significant association between LLINs ownership and female sex (AOR = 2.1 (95% CI: 1.15, 3.87) p=0.016), being married, cohabiting or separated. Although women owned the nets more, there was no statistical difference in morbidity between men and women.

**Conclusions**
Despite the high levels of ownership of LLINs, usage is minimal with a consequential effect on malaria morbidity. The study recommended sensitization on LLINs usage as measures to increase usage levels and the need for long-acting injectable prophylactic and chemoprophylactic that will allow transmission control.

## 350

# Prevalence of K540E mutation in plasmodium falciparum isolates among asymptomatic pregnant women receiving IPTp-SP at selected clinics in Nchelenge Northern Zambia

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**Keywords**
IPTp-SP,sulphadoxine-pyremethamine resistance;malaria;mutation;pfdhps

**Introduction**
Malaria infection during pregnancy is responsible for adverse birth outcomes. To protect against adverse pregnancy outcomes. The WHO recommends providing intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) to pregnant women at each scheduled antenatal (ANC) visit. However, the loss of parasite sensitivity to SP has compromised its efficacy. Studies have revealed that resistance to SP is associated with Single Nucleotide Polymorphisms in the dihydrofolate reductase and dihydropteroate synthase (dhps) genes of Plasmodium falciparum including in position 540 of the dhps gene. Mutations in codon 540 are proxy measures for the presence of all 5 key mutations. Current study is part of the ASPIRE trial (Registration: NCT04189744) which is aimed at addressing the dual burden of malaria and curable sexually transmitted and reproductive tract infections in pregnancy. The objective of this study was to estimate the prevalence of the K540E mutation in a sample of 200 malaria-positive women.

**Methods**
Study was cross-sectional by design and was conducted in four health facilities, Nchelenge. 5,422 pregnant women were recruited at their first antenatal visit from November 2019 to August 2022. Dried Blood Spot samples were collected from all the participants. Plasmodium falciparum DNA was isolated using the Chelex method and detected using SYBR green on the ABS 7500 fast Real-time Polymerase Chain reaction platform. The mutations were detected using the Polymerase Chain Reaction restriction fragment length polymorphism method.

**Results**
Out of 5,422 samples, 2888 (55.1%, 95% CI= 51.9-55.5) tested positive. Of these, 200 were randomly selected for the determination of P. falciparum dhps mutations associated. K540E marker was found in 68.8% (95% CI= 61.2-74.1) samples.

**Conclusions**
data suggest a high prevalence of P. falciparum K540E mutation which is associated with resistance to SP, which may explain the reduced efficacy of IPTp treatment in Zambia. More efficacious antimalarials are needed to address malaria in pregnancy.

## 357

## Transmission of trypanosomiasis by tsetse flies in three active HAT foci of the Republic of Congo.

Irina Anne Emmanuelle Bemba[1,2], Arsene Lenga[1], Herman Parfait Awono-Ambene[2], Christophe Antonio-Nkondjio[2]

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**Keywords**
Transmission, stetse flies, HAT, Republic of Congo

**Introduction**
Human African Trypanosomiasis (HAT) is a neglected tropical disease still endemic in the Republic of Congo. Despite continuous detection of HAT cases in the country, there is still not enough data on trypanosome infections in tsetse flies, trypanosome species and tsetse flies species distribution in endemic foci. The present study is intended to fill this gap and improve understanding on trypanosome circulation in three active foci in the centre and south of Congo.

**Methods**
Pyramid traps were set in various places in villages to collect tsetse flies both during rainy and dry season. Once collected, tsetse flies were identified using morphological keys. DNA extracted from flies was processed by PCR for species identification and detection of trypanosome

**Results**
A total of 1291 tsetse flies were collected. The average apparent density of fly per day was 0.043 in Mpouya, 0.73 in Ngabé and 2.79 in Loudima. Glossina fuscipes quazensis was the predominant tsetse fly found in Ngabé and Mpouya, while Glossina palpalis palpalis was the only tsetse fly found in Loudima. A total of 224 (17.7%) flies were detected infected by trypanosomes; 100 (7.91%) by Trypanosoma congolense savannah, 22 (1.74%) by Trypanosoma congolense forest, 15 (1.19%) by Trypanosoma vivax, 83 (6.56%) by Trypanosoma brucei (s.l.) and 2 (0.16%) undetermined species. A total of 57 co-infections between T. brucei (s.l.) and T. congolense savannah or T. brucei (s.l.) and T. congolense forest were found only in G. p. palpalis. Loudima recorded the highest number of infected tsetse flies

**Conclusions**
The study provided updated information on the dynamics of tsetse fly populations as well as on the transmission of trypanosome species in the different active HAT foci in Congo. The data suggest high transmission of animal trypanosomes and possibly human trypanosomes in these foci. The study stress the need for active surveillance in these endemic foci

## 547

## Outcomes of reassessment for TB-presumptive children four months after TB rule out: A cross-sectional survey within the CaP-TB project in Cameroon

Loic Feuzeu[1], Leonie Simo[1], Rogacien Kana[1], Elvis Moma[1], Albert Kuate[2], Pierette Omgba[3], Mikhael de Souza[4], Simplice Lekeumo[1], Martina Casenghi[4], Anne Cecile Zoung-Kanyi[5], John Ditekemena[6], Patrice Tchendjou[1], Boris Tchounga[1]

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**Keywords**
Pediatric Tuberculosis; symptom screening; TB rule out; Reassessment; outcomes

**Introduction**
Tuberculosis (TB) is a leading cause of mortality among children because of challenges in diagnosis and treatment. The catalyzing pediatric TB innovation (CaP-TB) project was implemented to improve pediatric TB care through integration and decentralization of TB services. The project was shown effective by the INPUT stepped-wedge trial. Health outcomes for children for whom TB had been ruled out, however, remain of concern.

**Methods**
A cross-sectional survey was conducted among TB-presumptive children in the CaP-TB project who were bacteriologically negative between October 2020 and March 2021. The reassessment took place four months after TB diagnosis was ruled out. Phone calls were made to caregivers of eligible children to determine the presence of TB symptoms and health outcomes in the children. Symptomatic children were invited to attend the health facility for further TB investigation, free of charge.

**Results**
Of 2,355 children eligible for reassessment, 1,595 (67.7%) care givers were reached by phone. They reported that 27 (1.7%) children had died, at a median of 60 [IQR 29-120] days after TB diagnosis was initially ruled out. Among the living children, 1,371 (87.4%) were asymptomatic, 172 (11.0%) had symptoms suggestive of TB, and 25 (1.6%) were receiving TB treatment. Less than half (n=72, 41.9%) of the symptomatic children came to the health facility for further TB investigation, with eight (11.1%) diagnosed with TB. Mortality information was collected from 20 caregivers with eight (40%) reporting at least two TB-suggestive symptoms at the time of the child's death

**Conclusions**
The majority of children who presented with symptoms suggestive of TB were asymptomatic four months after TB was ruled out. However, this study identified the existence of TB cases likely missed and possible TB-related deaths among symptomatic children in which TB was initially ruled out. Systematic reassessment of bacteriologically-negative children can help with retrieving missed cases

## 594

## Lived experiences and coping strategies of HIV positive persons with visual impairment in Lira district, Northern Uganda in March 2022.

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**Keywords**
HIV infection, coping strategies, lived experiences, visual impairment.

**Introduction**
HIV/AIDS remains a global health concern with devastating social and economic impact on the African continent with close to 38 million people living with it globally yet only 21.7 million people have access to treatment and 17% of persons with disability are infected with women disproportionately affected yet very little information is available in this subject of HIV and disability.

This was a qualitative phenomenological study aimed to describe the lived experiences and coping strategies of HIV positive persons with visual impairment in Lira district.

**Methods**
This was a qualitative phenomenological study conducted among 30 visually impaired persons attending or had attended the ophthalmology clinic at Lira regional referral hospital selected purposively and were 18 years old and consented to participate in the study using the saturation principle. Data was collected using structured narrative interview guide and analyzed using thematic approach.

**Results**
Of the 30 participants interviewed, 17 were females, 13 were males, ages ranged from 19-68 years and majority(18) were farmers.

Participants reported feelings of disappointment, disorganization, disorientation and even cursing life; challenges like negative attitudes from healthcare workers, transport and lack of knowledge about community drug distribution points and village health teams and coping strategies like spirituality, community rehabilitation and psychosocial support.

**Conclusions**
Visually impaired persons are still at an increased risk for HIV infection and face a complexity of psychological, social, physical and emotional challenges as they try to access the antiretroviral treatment services.

Therefore community drug distribution points, homebased healthcare and psychosocial support network would be of great benefit to them in helping them cope up with the situation.

## 618

## Assessing Existing Legal and Administrative Frameworks Related to High-Consequence Agents and Toxins in Egypt: Opportunities for Strengthening National Biopreparedness, August 2022

Wael ElRayes[1], Hoda Mansour[2], Ali Asy[3], Mona El-Shokry[4], Marwa Farid[5], Alaa Rass[6], Mohamed Sabaa[7], Youssef Abdel Rahman[8], Ossama El-Akkad[9]

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**Keywords**
Legal and administrative frameworks, high consequence pathogens, national oversight, Biopreparedness

**Introduction**
The risks of biological events of public health concern are exacerbated by advancements in biotechnology, increased global travel and trade, non-state actors' interest in biological weapons, and increased interactions between humans, animals, and the environment. Emerging and re-emerging pathogens, endemic biological agents, and toxins can pose severe threats to human, animal, or plant health. Without strong national oversight and control over High Consequence Agents and Toxins (HCAT), accidental release or intentional use of these agents can lead to public

health emergencies with national and international consequences. This study aims to assess Egypt's legal and administrative frameworks for HCAT oversight.

**Methods**
From April 2020 through April 2022, we used a retrospective-prospective qualitative inductive conventional content analysis to identify and analyze legal text, existing hierarchical governmental structures, and decision-making processes related to HCAT and their management within all Egyptian legislations enacted from January 1889 through March 2022. Six team members independently reviewed legislative content, and consensus on relevancy and categorization was reached through in-depth team discussions. The US Federal Codes for Biological Select Agents and Toxins were used as an analog model.

**Results**
The research identified 41 existing laws and decrees addressing and regulating distinct aspects and practices related to specific infectious diseases that are mostly eradicated or controlled. The legislation doesn't include any content addressing HCAT, emerging or re-emerging infectious agents (e.g., Ebola, Marburg, Influenza) and doesn't provide strong governmental oversight over HCAT or laboratories working with them or a clear, structured, and unified national approach to responding to and managing biological incidents of public concern.

**Conclusions**
Egypt needs to update its legal and administrative frameworks to enhance its oversight and control over HCAT and enhance Egypt's biopreparedness capabilities to achieve its international commitments to the goals of IHR2005 and UN Security Council resolution 1540. This approach can be used by other countries.

## 625

## Pervasive malaria commodity stockout and high malaria RDT test positivity rates – A surprising relationship in Liberia

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**Keywords**
Rapid Diagnostic Tests (mRDT), Test Positivity Rates (TPR), Malaria

**Introduction**
Plan International Liberia (PIL) provides malaria testing and treatment to children under 5 (CU5) in Bomi, Nimba, and Margibi counties of Liberia through trained Community Health Assistants (CHAs). CHAs use mRDT to confirm malaria before initiating treatment. In 2021, the community-based mRDT TPR (88%) was higher than the average national facility-based TPR for febrile cases (68%). In 2022, PIL conducted an assessment to investigate the causes of this high TPR.

**Methods**
A variant of the General Elimination Methodology (GEM) - a two-staged theory-based evaluation approach – was used. The first stage, likely theoretical causes were identified through consultation with key stakeholders. In the second stage, the pre-identified causes were eliminated or confirmed using primary quantitative and qualitative data collected from 146 sampled CHAs and secondary 2021 data harvested from the grant's routine monitoring data and the national health management information system.

**Results**
Overall, CHAs had good knowledge of malaria symptoms (93%). Respectively, 90% and 100% CHAs conducted and interpreted mRDT results correctly. Over 90% stored mRDT commodities adequately.

However, over 50% CHAs have insufficient mRDT commodities and 60% of them were stocked out for more than a month. A chi-square test of independence conducted showed that mRDT TPR is likely to be more than 70 percent when there is limited testing commodities (as estimated by ≤30 febrile cases tested for malaria in a district in a month), X2 (1, N = 1085) = 12.91, p<0.001.

**Conclusions**

Low stocks of mRDT tests may increase TPR observed in hard-to-reach areas in Liberia. Limited mRDT supply led to selective testing of only CU5 with a very high positive malaria testing likelihood and ruling out those with any symptom that might be indicative of other conditions. Additional studies need to be conducted on the relationship between mRDT TPR and persistent malaria commodity stockouts.

## 646

## Evaluation of the comparative safety and efficacy of artemisinin-piperaquine and artemether-lumefantrine for the treatment of acute uncomplicated malaria among children in Ibadan, South-west Nigeria.

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**Keywords**

AP, AL,antimalarial efficacy and safety in Southwest Nigeria

**Introduction**

WHO recommended that all countries use one of five different artemisinin-based combination therapies (ACTs) for the treatment of acute uncomplicated falciparum malaria. Artemisinin-piperaquine (Artequick™) is one of the ACTs available in Nigeria and studies conducted on artemisinin-piperaquine showed that it compared well with other ACTs but data relating to its safety and efficacy in our environment were sparse.The need for a cost effective and user friendly antimalarial with good tolerability and efficacy was highly desirable to expand the number of ACTs in Nigeria and the need to continue to optimise tolerability, efficacy, costs, and treatment regimens led to this clinical trial. Aim:To compare the safety and efficacy of artemisinin-piperaquine (AP) and Artemether-lumefantrine (AL) in children with acute uncomplicated malaria in South-West Nigeria

**Methods**

The study was a randomized controlled trial conducted in Ibadan, Nigeria. Children (117) aged 2-10 years with uncomplicated malaria were enrolled and followed up for 28 days using the WHO antimalarial efficacy testing protocol. Enrollees were randomized to receive AP (58) or AL (59) at standard doses for three days.Laboratory evaluations for hematological, liver and renal functions were done at D0 and D7 as part of safety evaluation.

**Results**

Geometric mean parasite densities were 17,406/µL and 11,571/µL for AP and AL respectively (ρ =0.301). Response of infection to treatment was prompt. Crude ACPR rate for AP was 96.1% and 90.4% for AL (ρ= 0.428). Parasite clearance time was significantly shorter for AL (1.81±0.63 days) compared with 2.34±0.70 days for AP (ρ <0.001). Fever clearance times were 1.33±0.66 and 1.13±0.34 days (ρ=0.181) for AL and AP respectively. Gametocyte clearance time was shorter for AL than AP (3 versus 7 days). Both drugs were well tolerated.

**Conclusions**

AP and AL are safe and efficacious for the treatment of uncomplicated malaria in children in southwest Nigeria

## 650

## LOW AVIDITY ANTIBODIES CORRELATE WITH THE EXPANSION OF ATYPICAL MEMORY B CELLS IN MALARIA IMMUNE ADULTS LIVING IN HIGH TRANSMISSION REGIONS IN GHANA

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**Keywords**
Avidity, Atypical memory B cells, Immunity, Antibody response

**Introduction**
Antibody avidity, a measure of affinity maturation significantly affects antibody responses during infections. High avidity antibodies are usually acquired after a few P. falciparum infections especially in low transmission regions. Understanding immunological memory and the functionality of antibody responses to Plasmodium falciparum is key in anti-malarial vaccine development. However, it is unclear if the expansion of atypical memory B cells which usually occurs after repeated exposure is responsible for the production of low avidity antibodies. This study sought to determine the correlation between low avidity antibodies and the expansion of atypical memory B cells in the high transmission regions in Ghana.

**Methods**
The breadth of antibody responses and relative avidity to a panel of P. falciparum merozoite antigens (AMA1, MSP3, MSRP5, RAMA, SERA 9 and GLURP-RO) was determined by Indirect ELISA in individuals living in a high malaria transmission area (Efutu and Moree) compared to individuals in a low transmission area (Accra). Different peripheral B cell populations were characterized using flow cytometry.

**Results**
The median plasma antigen-specific IgG levels were significantly higher for all 6 antigens in individuals from the Central Region compared to Accra. The relative avidity indices were higher in Accra compared to Efutu and Moree for RAMA, MSRP5 and CyRPA. With the B cell phenotyping, individuals living in Efutu and Moree had elevated levels of atypical and activated memory B cells. Comparatively, adults from Accra had significantly higher levels of naïve B cells. There was no significant difference in the frequency of classical memory B cells across the two sites. However, there was a positive correlation between the breadth of reactivity to antigens and measured percentage inhibition.

**Conclusions**
The findings from this study suggest that the increase in the low avidity antibodies may be driven by the expansion of atypical memory B cells after repeated exposure to P. falciparum antigens.

## 654

## EVALUATION OF THE IMPACT OF COVID-19 PANDEMIC ON PRIORITY DISEASE RESEARCH PRODUCTION AND FUNDING IN AFRICA

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**Keywords**
Covid-19 impact, priority Infectious diseases, research production, research funding, Africa

**Introduction**
The Covid-19 pandemic emerged at the time where Africa was still battling with a plethora of other health challenges. We evaluated the impact of Covid-19 pandemic on Africa's priority disease (PD) research production and funding.

**Methods**
Published articles between 2018-2020 with an African affiliation was retrieved from Web of Sciences, MEDLINE and African Journals OnLine. Search terms for PD were identified by MeSH terms and queried from articles' title, keywords and keywords plus section using Biblioshiny package in R. PDs were defined as: (i) top 10 killer diseases (ICD-2019); (ii) neglected-tropical diseases (NTDs); (iii) re-/emerging diseases and (iv) potential top 10 causes of future pandemics (next pandemic diseases, GAVI/WHO). The big-three are HIV/AIDS, TB and malaria. Research funding was compared between the period before (2018-2019, P1) and during Covid-19 (2020-2021, P2).

**Results**
Globally, 427405 articles were published during the period 2018-2021, 23.8% on PD research. Among PD research papers (n=101684), 49.4% were funded. Overall, out of the total research production, PD research significantly decreased from P1 to P2 for the big-three (7.1% to 6.5%), NTDs (1.3% to 1.1%) and next pandemic diseases (0.4% to 0.3%), $P<0.05$. Concerning research funding, HIV/AIDS showed the highest funded papers. Out of the total funded research in Africa, a decrease of funding from P1 to P2 was observed for: big-three (10.6% to 9.2%), NTDs (1.8% to 1.6%), re-emerging & emerging diseases (1.0% to 0.9%) and next pandemic diseases (0.7% to 0.5%), $P<0.05$.

Generally, most contributing countries on PD research in Africa were South Africa, Egypt, Nigeria, Ethiopia, Uganda and Kenya; most of them showed a significant decrease in their research funding from P1 to P2.

**Conclusions**
Covid-19 pandemic played a role in the significant decrease of PD research funding in Africa, especially in African countries with the highest research capacity.

## 722

## Positive impact of text message reminders to Private Health Service Providers on TB case notifications in Anambra State Nigeria.

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**Keywords**
Tuberculosis, TB case notification, Missing TB cases, Text message

**Introduction**
Nigeria is ranked 8th among the high Tuberculosis (TB) burden countries globally accounting for 80% of TB cases worldwide. The major issue in TB programme in Nigeria is low TB case finding as Nigeria accounts for 9% the of missing cases worldwide. Since the start of Global Fund Public Private Mix project in 2019, screening of every client attending out-patient department (OPD) is one of

the active case finding strategies that has proven to yield result. In Anambra, less than 7% of the trained private health sector providers were reporting TB data and the major culprit to this trend are the patent medicine vendors(PMV) which were the largest providers trained at the commencement of the project.

The objective is to review the impact of continuous engagement of private sector TB service providers through biweekly text message reminders in Anambra State, Nigeria.

**Methods**
Ensuring 100% OPD TB screening was one of the key messages to the TB service providers at their TB training. During the trainings, phone details of health care workers (HCWs) were collected and archived. TB screening guide were shared to all the HCWs, also placed in strategic areas in their facilities and biweekly text message reminder on TB screening were also sent by the researchers. TB Linkage Coordinators collate and send report weekly.

**Results**
The intervention period is July to December 2021. Six months pre and post-intervention data were analysed; 75% (pre-3287 & post-5751) and 63% (pre-455 & post-741) increase in presumptive and notified TB cases respectively, were observed following the intervention.

**Conclusions**
Text message reminders to healthcare providers is a low cost intervention which is very effective in increasing their index of suspicion of TB, conducting screening and finding the missing cases. It also helps foster ownership of the program among service providers and improves other program expectations.

## 768

## Pre-treatment loss to follow-up in adults with pulmonary tuberculosis: a qualitative evidence synthesis of patient and healthcare worker perspectives on contributing factors

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**Keywords**
Tuberculosis, pre-treatment loss to follow-up, qualitative evidence synthesis, healthcare system

**Introduction**
Since 2018, over 14 million people have been treated for tuberculosis (TB) globally. However, pre-treatment loss to follow-up (PTLFU) has been shown to contribute substantially to patient losses in the TB care cascade with subsequent high community transmission and mortality rates.

Objective

To identify, appraise, and synthesize evidence on the perspectives of patients and healthcare workers on factors contributing to PTLFU in adults with pulmonary TB.

**Methods**
We registered the title with PROSPERO (CRD42021253212). We searched nine relevant databases up to 24 May 2021 for qualitative studies.

Two review authors independently reviewed records for eligibility and extracted data. We assessed methodological quality with the Evidence for Policy and Practice Information Center tool and synthesized data using the Supporting the Use of Research Evidence framework. We assessed confidence in our findings using Confidence in the Evidence from Reviews of Qualitative Research (GRADE-CERQual).

**Results**

We reviewed a total of 1239 records and included five studies, all from low- and middle-income countries. Key themes reported by patients and healthcare workers were communication challenges among healthcare workers and between healthcare workers and patients; knowledge, attitudes, and behaviours about TB and its management; accessibility and availability of facilities for TB care; and human resource and financial constraints, weakness in management and leadership in TB programmes. Patients' change of residence, long waiting times, and poor referral systems were additional factors that contributed to patients disengaging from care. We had moderate confidence in most of our findings.

**Conclusions**

Findings from our QES highlight multiple factors that contribute to PTLFU. These factors relate to patients, healthcare workers, and the healthcare system. Central to addressing these factors will be the need to strengthen health systems and offer people-centered care.

## 830

## High-level of cross-resistance to second generation non-nucleoside reverse transcriptase inhibitors among patients failing antiretroviral therapy in Cameroon (November 2019-December 2021) : Implications for future ART-regimens in Africa

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**Keywords**

Etravirine,Rilpilvirine,Doravirine, HIV drug resistance, Cameroon.

**Introduction**

Etravirine (ETR), rilpivirine (RPV) and doravirine (DOR) are second generation (2Gen) non-nucleoside reverse transcriptase inhibitors (NNRTI) approved for the treatment of HIV-1 infection.In Africa, there are limited data on the resistance profile of 2Gen-NNRTI.This study aimed to evaluate 2Gen-NNRTI resistance and their susceptibility in patients failing antiretroviral treatment (ART) in Cameroon.

**Methods**

A cross-sectional study was conducted from 2019-2021 among 340 patients failing ART, received at the Chantal Biya International Reference Centre.Treatment history and immuno-virological data were obtained from patients' files. Genotypic resistance testing was interpreted using Stanford HIVdb v8.7. The penalty scores of drug resistance were ≥60 (high-resistance);30–59 (intermediate-resistance); <30 (susceptible).Acceptable threshold for potential drug-efficacy was set at >50% at population-level.

**Results**

A total of 340 patients were enrolled, of which 230 were failing first-line (1Gen-NNRTI based) and 110 second-line (protease-inhibitors) regimens.Median [IQR] CD4 and viremia were respectively 184 [60–332] cells/µl and 82,374 [21,817–289,907] copies/ml; ART-duration was 18 [10–27] months. Overall rate of resistance to 2Gen-NNRTI was 79.70% [71.30–87.02],

similar between first- vs second-lines. Prevailing mutations were: Y181C (23.52%),G190A (17.64%) and P225H (13.53%).Drug susceptibility rate was 52.05% (ETR); 43.23% (RPV), 36.17% (DOR).Following susceptibility profile, patients failing on EFV-based regimens were more susceptible to 2Gen-NNRTI (OR=0.42;95%CI:[0.24–0.74]; p=0.003), while those failing after receiving EFV and NVP were less susceptible to 2Gen-NNRTI (OR=4.4; 95%CI:[1.16–14.81]; p=0.02). Low viremia (≤4log10) was associated with susceptibility to 2Gen-NNRTI (OR=0.22; 95%CI:[0.12–0.41]; p<0.0001). CRF02_AG was the prevailing subtype (58.53%),followed by A1 (11.47%);without any significant effect on 2Gen-NNRTI susceptibility (CRF02_AG vs non-AG; p=0.8).

**Conclusions**
In Cameroon, there is a high-level of cross-resistance to 2Gen-NNRTI. However, etravirine retains residual efficacy in half of the population.Thus, after ART-failure in African patients, the use of etravirine as 2Gen-NNRTI is possible, pending genotypic profiling.

## 832

## Adaptability of filter paper for DNA extraction as a point-of-care technique for the detection of Schistosoma haematobium 6 weeks post Praziquantel administration in May 2021 around the Likomba Health Area, Cameroon.

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**Keywords**
Adaptability, control, perspective, probes, Schistosomiasis

**Introduction**
A specie-specific 121 region of the Dra I gene of Schistosoma haematobium has been amplified and its cell free DNA in urine detected after amplification using the polymerase chain reaction (PCR) technique. We sought to assess the performance of this technique in the diagnosis of schistosomiasis in an area of high prevalence, six weeks post Praziquantel administration. More accurate and field friendly diagnostic techniques are urgently needed in the control of neglected tropical diseases during field surveys and in primary health care.

**Methods**
About 30ml of urine was collected from 127 children and young adults of age 5 to 20 years, who had been given Praziquantel six weeks before. 10ml of each urine sample was used to check for parasite eggs by the syringe filtration (SF) technique. Parasite DNA trapped by filtering 20ml of urine through Whatman filter paper number 3, was extracted and amplified using specific primers in a PCR. Amplified DNA fragments were viewed on 2% agarose gel. The diagnostic accuracy of the two methods were compared.

**Results**
S. haematobium specific DNA was detected even in urine samples where no egg was found by microscopy. The prevalence of infection were 15.7% and 44.1% using SF and PCR techniques respectively. The sensitivity of PCR was much higher than that of SF technique at 85.2% with a specifity of 100%. There was a significant difference in the prevalence of the two techniques a X2(p=0.001).

**Conclusions**
A small sample volume is still adequate for the extraction, amplification and detection of S. haematobium DNA urine. This method holds promise for the development of PCR related technologies adapted to point-of-care. It is suitable for diagnosis at the pre-patent and chronic stages and also post Praziquantel administration. The development of probes that could detect the DNA on the filter paper is in perspective.

## 839

## Effectiveness of seasonal malaria chemoprevention in three regions of Togo: a population-based longitudinal study from 2013 to 2020.

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**Keywords**
Chimioprévention du paludisme saisonnier, Efficacité, Enfants, Togo.

**Introduction**
En 2012, L'OMS a recommandé la Chimioprévention du Paludisme Saisonnier (CPS) dans les zones de forte transmission. Bien qu'elle soit mise en œuvre depuis 2013, son efficacité au Togo n'a jamais été mesurée. L'objectif de cette étude était de mesurer l'efficacité de la CPS chez les enfants âgés de 3 à 59 mois vivants dans les régions participantes du Togo de 2013 à 2020.

**Methods**
Cette étude longitudinale a analysé les données de routine des campagnes CPS du Togo entre 2013 et 2020. La couverture du traitement, les raisons de non administration et les effets indésirables ont été analysés par année et par cycle de traitement. Les modèles logistiques à effets aléatoires ont démontré l'efficacité de la CPS par district sanitaire, par année et par Cycle.

**Results**
La couverture globale de la CPS entre 2013 et 2020 était de 98 %. Au cours de la période d'étude, les cas confirmés de paludisme sont passés de 11269 (1er Cycle de 2016) à 1395 (4ème Cycle de 2020). 2398 effets indésirables ont été signalés (prévalence : 3/10 000). Aucune réaction cutanée grave (telle que le syndrome de Stevens Johnson ou de Lyell) n'a pas été rapportée. Avec 2016 comme année de référence, le pourcentage de réduction de la prévalence du paludisme a été observé à 22,6% en 2017 ($p<0,001$) et a atteint 75% en 2020 ($P<0,001$). L'efficacité du CPS variait de 76,6 % pour le deuxième cycle à 96,2 % pour le quatrième cycle par rapport au premier cycle.

**Conclusions**
La CPS a réduit de manière significative les cas de paludisme chez les enfants de moins de cinq ans au Togo. Ces résultats confortent tous les acteurs et appellent à une intensification des efforts pour atteindre les objectifs d'élimination de l'OMS pour 2030.

## 846

## VIRAL SUPPRESSION IN THE ERA OF TRANSITION TO DOLUTEGRAVIR-BASED THERAPY IN CAMEROON: CHILDREN AT HIGHEST RISK OF VIROLOGICAL FAILURE

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**Keywords**

HIV, Virological success, ART duration, Dolutegravir at first-line therapy, Cameroon

**Introduction**

Transition to Dolutegravir (DTG)-based antiretroviral therapy (ART) may improve virological response (VR) in sub-Saharan Africa. Because VR may vary by age, understanding ART response across age-range may inform interventions on ART program. Our objective was to compare VR between children, adolescents and adults in the Cameroonian context.

**Methods**

A comparative study was conducted from January 2021 to May 2022 amongst ART-experienced patients received at the Chantal BIYA International Reference Centre for HIV/AIDS prevention and management in Yaoundé-Cameroon for plasma viral load (PVL) monitoring. PVL was measured on Abbott m2000RT-PCR as per manufacturer's instructions. VR was defined as viral suppression (VL<1000 copies/mL) and viral undetectability (VL<50 copies/mL). Data were analyzed by SPSS v.20.0, with $p<0.05$ considered as significant.

**Results**

A total of 9034 patients, 72.2% female, were enrolled (8565 adults, 227 adolescents, 222 children); 1618 were on NNRTI-based, 299 on PI-based and 7117 on DTG based ART (92 children, 198 adolescents, 6824 adults). Median (IQR) duration on ART was 36 (27-39) months. Overall, VS was 89.9% (95% CI: 89.2-90.5) and 75.8% (95% CI 74.8-76.7) had achieved viral undetectability. By ART-regimen, VS on NNRTI-based, PI/r-based, and DTG-based therapy was respectively 86.5%, 60.2% and 91.9%, $p<0.0001$. By ART duration, VS was respectively 90.4% (M12), 87.8% (M24), 89.1% (M36) and 90.0% (≥ M48), $p<0.0001$. By sex, VS was 91.0% for female and 87.1% for male, $p<0.0001$. Most importantly, VS by age was significantly different, ranging from 65.2% in children, 74.4% in adolescents and 90.9% om adults, $p<0.0001$.

**Conclusions**

In the current ART program, nine out of ten Cameroonian patients achieve VS, with a superior efficacy of DTG-based ART (mainly adults). Nonetheless, male and pediatric populations have poorer rates of VS, especially for children below 10 years. Thus, scaling-up pediatric DTG-based ART, especially in children, would improve ART performance in similar African settings.

## 878

## Dolutegravir-based Regimen Ensures High Virological Success despite prior Exposure to Efavirenz-based First-Line ART in Cameroon: A comparative Survey Indicating a Successful Transition Model

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**Keywords**
HIV; Antiretrovirals; First-line; TLD; Virological response; Cameroon

**Introduction**
In order to ensure optimal prescribing practices in the dolutegravir-era in Cameroon, we compared first-line virological response(VR) under Tenofovir+lamivudine+dolutegravir (TLD) according to prior exposure to Tenofovir+lamivudine+efavirenz(TLE).

**Methods**
A comparative study was conducted from June to December 2021 among patients initiating antiretroviral therapy (ART) with TLD (I-TLD) versus those transitioning from TLE to TLD (T-TLD) in Cameroon. HIV viral-load was performed and participants with >1000copies/ml had genotyping done by Sanger-sequencing. Statistical analyses were performed with p-values <0.05 considered statistically significant.

**Results**
Of the 12,093 patients followed, 310 (mean-age: 41±11years; 52.26%female) complied with study-criteria (171 I-TLD vs. 139 T-TLD). Median [IQR] ART-duration was 14 [12-17] months among I-TLDs vs. 28 [24.5-31] months among T-TLDs (i.e. 15 [11-19] months on TLE and 14 [9-15] months on TLD); and 83.15% (148/178) were at WHO clinical stages I/II. Overall viral suppression rate (<1000copies/ml) was 96.45% (299/310), with 97.08% (166/171) among I-TLDs vs. 95.68% (133/139) among T-TLDs (p=0.55). Additionally, VR was similar in I-TLD vs. T-TLD at <400copies/ml (94.15% vs. 94.42%). Age , gender, city of residence, duration on ART and WHO clinical stage were not associated with VR (all p>0.05). Intergrase genotyping was successful for 8/11 participants with no major mutations found; two subtypes were identified, CRF02_AG (7/8) and F2 (1/8).

**Conclusions**
Viral suppression is optimal under first-line TLD after 14 months, even with prior exposure to TLE. This evidence confirms the effectiveness of a transition from TLE to TLD in similar African settings, supported by strong pharmacological potency and genetic barrier of dolutegravir towards the global elimination of AIDS by 2030.

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## Evaluation of circulating and archived HIV-1 integrase drug-resistance variants among patients on third-line ART in Cameroon: implications for dolutegravir-containing regimens in resource-limited settings

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**Keywords**
Archived resistance, Third-line ART, Dolutegravir, Raltegravir, Cameroon.

**Introduction**
In order to ensure long-term efficacy of dolutegravir (DTG), we evaluated the genotypic resistance profile in viral reservoirs among patients on third-line (3L) antiretroviral therapy (ART) in Cameroon, according to prior exposure to raltegravir (RAL).

**Methods**
A facility-based study was conducted from May throughout December 2021, among patients on 3L from HIV treatment centres in Yaoundé and Douala. Plasma viral load was measured, and genotyping was performed on plasma-RNA and pro-viral DNA. HIV-1 drug resistance mutations were interpreted using HIVdb.v9.1 and phylogeny was performed using MEGA.v7, with $p<0.05$ considered statistically significant.

**Results**
Of the 12,093 patients on ART, 97 were in 3L and only 53 fully met our inclusion criteria. Median [IQR] age was 51 [40-55] years and the M/F sex-ratio was 4/5. Median [IQR] viremia at 3L initiation was 3,795 [220-169,322] copies/ml while CD4-count was 157 [84-285] cells/mm3. Overall median duration on ART was 192 [162-222] months. Regarding 3L, median duration on integrase strand-transfer inhibitors (INSTI)-containing regimens was 18 [12-32] months; 15.09% (8/53) were exposed to RAL and the most administered 3L was TDF+3TC+DTG+DRV/r (33.96%, 18/53). Only 5.66% (3/53) had unsuppressed viremia (>1000 copies/ml), with no major INSTI-resistance in both circulating-RNA and pro-viral DNA. Resistance testing in pro-viral DNA was successful for 18/22 participants and revealed 1/18 patient (5.56%, in the RAL-arm) with archived mutations at major resistance positions (G140R, G163R). Five subtypes were identified, CRF02_AG (12/18), CRF22_01AE (3/18), A1 (1/18), G (1/18) and F2 (1/18).

**Conclusions**
In Cameroon, 3L-experienced patients have a good virological response with low-level of archived mutations in the integrase. This finding underscores the use of DTG-containing ART for heavily-treated patients in similar programmatic settings. However, patients with prior exposure to RAL should be closely monitored following a stratified or personalized approach to mitigate risks of INSTI-resistance, alongside pharmacovigilance.

## 967

## Key populations hotspot mapping for HIV program microplanning in Harare, Zimbabwe; March 2022

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**Keywords**
HIV prevention, key populations, epidemic control,

**Introduction**
Zimbabwe has made significant progress towards HIV epidemic control. However, HIV prevalence among key populations (KPs), 42.2% for female sex workers (FSW) and 21.1% among men who have sex with men (MSM) is much higher than the general adult population (12.9%). KPs contribute a significant proportion of new HIV infections relative to their population size but have lower access to health services. KP hotspot mapping for microplanning is key for prioritization and placement of services to clients at highest risk of exposure to HIV.

**Methods**
In March 2022, Pangaea Zimbabwe (PZ) trained 33 KP Community Facilitators to conduct hotspot mapping in catchment areas around 18 supported public health facilities in Harare. 9 community dialogues were conducted with FSW, MSM and Transgender (TG). Validation was conducted for all listed sites. Number and type of hotspots, estimate number of KPs, peak days and times of activity were recorded. Data were entered into an excel database and analysed.

**Results**
Across the targeted catchment areas, 179 hot spots were identified, with an estimated 5395 KPs where 68% were FSW, 26% MSM, 2% TG, 3% PWUD and 1% other KP. Most popular types of hotspots were street bars (shebeens), bars, shops and home based and peak days were Thursday to Sunday as reported through 56% of the facilities. Peak times were evenings.

**Conclusions**
Newly mapped and existing hotspots were identified and several factors determine the 'success' and longevity of a hotspot. Hotspots are fertile ground for targeted service provision. KP gatekeepers have the potential to increase reach of targeted KP activities and service provision. Information from the exercise contributes to the Zimbabwe government's current National HIV and AIDS Strategic Plan highlighting the importance of 'not leaving anyone behind' and the shift in focus of HIV response towards micro targeting districts and specific populations for epidemic control achievement.

## 989

## Evaluation of the impact of one round of seasonal malaria chemoprevention on resistance markers associated with sulfadoxine-pyrimethamine and amodiaquine in Karamoja region, Uganda, March 2022.

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**Keywords**
seasonal malaria chemoprevention, resistance markers, Sulfadoxine-Pyrimethamine, Amodiaquine

**Introduction**
Malaria remains an important public health disease in several Sub-Saharan Africa countries including Uganda. Seasonal malaria chemoprevention (SMC) has been found to prevent approximately 75% of malaria episodes in children, including severe episodes, and can prevent deaths. However, due to the high prevalence of markers associated with sulfadoxine-pyrimethamine and amodiaquine (SPAQ) resistance, SMC has not been implemented at scale in east and southern Africa. This study assessed the impact of one round of SMC using SPAQ on the potential emergence and spread of drug resistant malaria in Karamoja region located in Northeastern Uganda where Malaria Consortium collaborated with Ministry of health to pilot 5 monthly SMC using SPAQ between May and September,2021.

**Methods**
Baseline and endline health facility-based, cross-sectional surveys were conducted one month before (April 2021) and one month after (November 2021) SMC-SPAQ distribution respectively. Molecular markers associated with resistance to SP (PfDHFR 164L, PfDHPS 581G, PfDHFR 51I, 59R, 108N, PfDHPS 437G and 540E) and AQ (PfCRT and PfMDR1 including copy number) were analyzed on 300 blood samples, taken as dry blood spots, from symptomatic children aged 3 to 59 months with a positive malaria test (by malaria RDT or microscopy) in both intervention (Moroto and Kotido) and control (Nabilatuk) districts.

**Results**
The five mutations of concern (PfDHPS 437G, 540E and DHFR 51I, 59R 108N) that mediate moderate SP resistance were prevalent but remained unchanged between baseline and endline. DHFR 164L and DHPS 581G mutations, that mediate high level SP resistance were rare at both baseline and after one round of SMC administration. Key mutations associated with 4-aminoquinolone resistance were rare in comparison to PfDHPS with PfDHFR mutations associated with sulfadoxine-pyrmimethamine resistance.

**Conclusions**
One round of SMC with SPAQ does not appear to select for an observable change in resistance markers for SP and AQ.

## 991

# Uptake of Intermittent Preventive Treatment in pregnancy (IPTp) with sulfadoxine-pyrimethamine (SP) through seasonal malaria chemoprevention (SMC) channel delivery in Mali and Burkina Faso: the INTEGRATION project, an implementation research founded by EDCTP.

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**Keywords**
Malaria in Pregnancy (MiP), Intermittent Preventive Treatment in pregnancy with Sulfadoxine-Pyrimethamine (IPTp-SP), Seasonal Malaria Chemoprevention (SMC), Sub-Saharan Africa (SSA), European and Developing Countries Clinical Trials (EDCTP)

**Introduction**
In sub-Saharan Africa, uptake of intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) during pregnancy remains low due to late antenatal care (ANC) attendance and missed opportunities by healthcare providers. By contrast, coverage of seasonal malaria chemoprevention (SMC) in children under 5 in Sahelian countries is high. This trial aims to evaluate the integration of IPTp-SP

delivery through the SMC channel to improve IPTp-SP coverage.

**Methods**
This is a 3-year multicentre cluster-randomized, implementation trial comparing coverage (primary endpoint) of IPTp-SP3+ and ANC uptake among pregnant women receiving IPTp-SP through SMC and ANC services (intervention arm), versus standard of care (ANC alone) in 40 clusters in Kangaba (Mali) and Boussé (Burkina Faso) districts (20 clusters in each country). In the intervention arm, field workers undertaking SMC home visits during the high malaria transmission season (July to October) will proactively identify pregnant women in the community, provide IPTp-SP to eligible women and encourage them to attend ANC visits during and after SMC rounds. In the control arm, pregnant women will receive IPTp-SP through ANC services only. Coverage, acceptability, feasibility and cost-effectiveness of IPTp-SP and ANC uptake will be assessed after two years of implementation.

**Results**
Baseline data was collected in May-June 2022 in a representative sample of women who had recently delivered. The intervention was introduced in July 2022 during SMC and will be evaluated in an endline survey in November-December 2023.

**Conclusions**
This strategy has the potential to boost ANC attendance and uptake of the latest WHO recommendations of eight ANC contacts, improving cost-effective resource allocation. The results are expected to improve policies, programmes and practices for both prevention of malaria in pregnancy and ANC follow-up in Mali and Burkina Faso, with potential to impact policy in other SMC countries.

## 997

## Factors associated with viral load non-suppression among adolescents and young people living with HIV on Antiretroviral therapy (ART) in Nyamagabe District, Rwanda from January to December 2021, "Case control study".

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**Conference Track**
Track 8: A renewed focus on Africa's major infectious diseases including HIV, TB and Malaria

**Keywords**
Case control study, HIV, Viral load non suppression, associated factors

**Introduction**
Effective ART leads to viral load suppression, which restores immune function, reduces HIV-related morbidity, prolongs survival and improves the quality of life of Person Living with HIV. A conducted study indicated a higher rate of non Viral load suppression in adolescents compared to young adults.The study aimed to determine factors associated with HIV Viral load non-suppression among adolescents and young people on ART In Nyamagabe District

**Methods**
An unmatched case-control study design was conducted among a sample of 162 adolescents and young people on ART (54 non-viral load suppression (cases) and 108 viral loads suppressed (Controls)) followed in care and treatment service from January to December 2021, controls were selected randomly at a ratio of one to two. Sociodemographic, Clinical and behavioral factors were collected and the outcome of interest was viral load non-suppression. multiple logistic regression models were used to check the association between studied factors and viral load non-suppression

**Results**
The adolescents and young people living with HIV with no occupation were 9 times more likely to not be suppressed than farmers (AOR:9.03; CI:1.31-62.07). The adolescents and young people living with HIV on ART who had Side effects of ART were 7 times more likely to not be suppressed their viral load than those without ART side effects (AOR:6.93; CI:2.47-19.43). The adolescents and young people living with HIV on ART with poor adherence were 27 times more likely to not be suppressed their viral load than those who had good adherence (AOR:26.49; CI:5.22-134.53).

**Conclusions**
No occupation, Having Side effects of ART, and poor adherence were the most important factors associated with viral load non-suppression among adolescents and young people living with HIV/AIDs, more efforts should be focused on strengthening intensive adherence counseling and home visit to those who are not suppressing.

## 1042

## Knowledge, attitude, and uptake of HIV self-testing among undergraduate students at Jomo Kenyatta University of Agriculture and Technology, December 2020

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**Keywords**
HIV, self-testing, students, uptake

**Introduction**
HIV self-testing (HIVST) is a relatively new and innovative strategy that has the potential to increase HIV testing uptake because it addresses the limitations of existing HIV testing programs, such as confidentiality and convenience. However, many people are still unaware of their HIV status, despite the attention HIVST has received. This includes young adults (15-24 years), who accounted for 51% of new HIV infections in 2019. This study aimed to determine the level of HIVST knowledge, attitude, and uptake among undergraduate students at JKUAT.

**Methods**
This study was a descriptive cross-sectional survey. An online questionnaire was used for data collection from the 379 participants drawn from a study population of 29,500 through proportional quota sampling. Data analysis was performed using SPSS version 24 with logistic regression analyses being used to determine associations between variables.

**Results**
A majority of the respondents (91.6%) were aware of HIVST, 53.1 % had learned about HIVST by reading about it, and almost half (44.9%) had seen a HIVST kit. Most students had a positive attitude towards HIVST, with 97.2 % acknowledging its role in reducing the HIV burden and facilitating linkage to care. Only 18.3 % reported having challenges performing the test. Overall, HIVST uptake was minimal, with just 16.6% of respondents having used one previously. Nevertheless, most respondents (81.8 percent) said they would take HIVST in the future. Gender, residence, relationship status, study year, and college were not statistically significant ($p > 0.05$) and were not linked to greater HIVST uptake.

**Conclusions**
The study demonstrated that undergraduate students had knowledge about HIVST, a positive attitude towards HIVST, and a willingness to use HIVST, but their uptake of HIVST was poor. As a result, public awareness programs demonstrating the use of HIVST are needed in tandem with policy changes to support and ensure the availability of affordable HIVST kits.

## 1050

## Early detection of Malaria Outbreak in Elgeyo Marakwet County, Kenya June 2022; Usefulness of the Malaria Epidemic Preparedness Application

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**Keywords**
Male, Malaria, Microscopy, Public Health, Disease Outbreaks

**Introduction**
Africa reported 228 million malaria cases in 2020, with 95% of cases in Sub Saharan Africa. Kenya, with 18% of outpatient cases due to malaria, is classified among top fifteen high burden Malaria countries in Africa. Using weekly surveillance reports, Kenya tracks confirmed malaria cases in the Epidemic Preparedness and Response (EPR) application. Elgeyo-Marakwet, a seasonal and highland epidemic-prone county in Kenya, reported increased malaria cases beyond set alert thresholds in epidemic week 22 and action thresholds in epidemic week 24 on the EPR application. We sought to confirm the existence of the outbreak and assess the effectiveness of EPR application.

**Methods**
We conducted the investigation in Elgeyo Marakwet County from 29th June to 6th July 2022. A confirmed case was defined as a person with clinical signs and symptoms of malaria with a positive blood microscopy test or malaria rapid diagnostic test (mRDT) between January-June 2022. We abstracted medical records in five health facilities and compared them against set alert and action thresholds. We interviewed one key informant per facility on availability and use of standard data tools and guidelines. Data were analysed using descriptive statistics

**Results**
A total of 1736/2759 (62.9%) malaria cases were confirmed. Median age of cases was 14 years (IQR 24 years), with 473/1736 (27.7%) cases under 5 years. Males contributed 889/1736 (51.2%) cases. Cases confirmed via microscopy were 1581/1736 (91.1%). Abstracted malaria cases against set thresholds surpassed alert threshold in epidemic week 20 and alert thresholds in epidemic week 23. Zero malaria deaths were reported. A total of 2/5 (40%) key informants were aware of EPR guidelines with 5/5 (60%) using weekly surveillance tools.

**Conclusions**
Malaria outbreak was confirmed in Elgeyo Marakwet. Malaria EPR application is effective as an early warning and response system for malaria in Elgeyo Marakwet county

## 1052

## Identification of blood meal sources of wild-caught Phlebotomus orientalis and Ph. papatasi vectors of leishmaniasis in Sudan

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**Keywords**
Host preferences; blood meal identification; Phlebotomus orientalis; Phlebotomus papatasi; leishmaniasis; Sudan.

**Introduction**
Understanding the feeding behavior and host choice of sandflies provides valuable information on vector-host relationships and elucidates the epidemiological patterns of leishmaniasis transmission. Blood meal analysis studies are essential for assessing the relative human disease risk and assisting in identifying the other potential hosts of leishmaniasis. In Sudan and most of East Africa, there are large remaining gaps in knowledge regarding the feeding habits of phlebotomine vectors. The study aimed to identify the blood meal sources and, therefore, the host preferences of the principal vectors Phlebotomus orientalis and Ph. papatasi in leishmaniasis endemic areas of eastern and central Sudan.

**Methods**
Sandflies were collected from two endemic villages in eastern and central Sudan using CDC light traps and sticky traps. The phlebotomine sandflies were morphologically and then molecularly identified. The source of blood meal of the engorged females was determined using a multiplex PCR methodology and specific primers of cytochrome b gene of mitochondrial DNA for humans, goats, cows, and dogs. The detection of the Leishmania parasite was done using PCR.

**Results**
The total number of collected female phlebotomines was 180. Morphological identification revealed the abundance of Ph. orientalis 103 (57.2%), Ph. papatasi 42 (23.3%), Ph. bergeroti 31 (17.2%), Ph. rodhaini 2 (1.1%), and Ph. duboscqi 2 (1.1%) in the study sites. Out of the 180 collected, 31 (17%) were blood-fed. Three species were blood-fed and molecularly identified: Ph. papatasi (N= 7, 22.6%), Ph. bergeroti (N= 9, 26%), and Ph. orientalis (N=15, 48.4%). Blood meal analysis revealed human DNA in two Ph. orientalis (6.4%), hence, the anthropophilic index was 13.3%.

**Conclusions**
The results indicate that Ph. orientalis are anthropophilic in the study areas. Further studies on larger blood-fed sample sizes are required to validate the potential applications of this technique in designing, monitoring, and evaluating control programs, particularly in investigating the potential non-human hosts of leishmaniasis.

## 1071

## Retention on Pre-Exposure Prophylaxis among Female Sex Workers in Kigali, Rwanda, July 2022

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**Keywords**
Pre-Exposure Prophylaxis (PrEP), Female sex workers (FSW), PrEP retention

**Introduction**
Although Pre-Exposure Prophylaxis (PrEP) uptake among female sex workers (FSW) has increased, retention remains low. This study aimed at determining PrEP retention rates and factors associated with PrEP retention among FSW in Kigali, Rwanda.

**Methods**
We undertook a retrospective cohort study abstracting PrEP records for FSW from five health centers for the period between April-June 2020 and April-June 2021. We used Kaplan-Meier analysis to estimate probability of survival on PrEP at months 1,3,6,9, and 12 post-PrEP initiation, and cox regression to determine factors associated with 12-month PrEP retention. Data was analyzed using STATA 14.0.

**Results**
Out of 309 records reviewed, 268 (87%) FSW data was complete and used in the analysis. Of these, 42% were aged 30-39 years, 52% were single, 73% completed primary as their highest level of education, 69% had no jobs besides sex work, and 88% lived alone. PrEP dropout rates were 228, 65, 29,

49, and 36 per 100-persons years at months 1, 3, 6, 9 and 12 respectively, with 0.81, 0.72, 0.67, 0.59 and 0.53 of FSW that started PrEP retained at these corresponding time periods. Multivariable cox regression revealed that those aged 30-39 years (aHR=5.714; 95%CI: 1.927, 16.949), desire to have 3 or 4 more children (aHR=12.048; 95%CI:1.595, 90.909), and using other contraceptive methods such as pills relative to condoms (aHR=3.03; 95%CI:1.318, 6.944) were factors positively associated with PrEP retention; while accessing PrEP from ultra-urban clinics (aHR=0.412; 95%CI: 0.250, 0.679) and inconsistent condom-use (aHR=0.436; 95%CI: 0.227, 0.836) were factors negatively associated with PrEP retention.

**Conclusions**
We observed a steady decline in PrEP retention among FSW with about half retained at 12 months. To improve PrEP retention, focus should be on younger FSW and those not desirous of having children while strengthening community monitoring in urban settings.

## 1079

## Abundance and biting habits of anopheline mosquitoes, and their association with malaria incidence in Rwandan lowlands: analysis data from two entomological surveillance sentinel sites, 2012-2020

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**Keywords**
Malaria, anopheles gambiae, entomology, human biting rate, endophagic index, Rwanda

**Introduction**
Malaria remains an important contributor to morbidity and mortality in Sub-Saharan Africa. This study aimed to assess the composition, and behaviors of anopheles species, and how they influence the dynamics of malaria transmission in the endemic lowlands of Eastern Province, Rwanda

**Methods**
This cross-sectional study used data collected between January 2012 and December 2020. Mosquitoes were collected twice monthly in three different villages at each sentinel site, using Human Landing Catches (HLC) method. Monthly malaria incidence data from these sites were extracted from the electronic surveillance system. Stata Version 16 was used for the descriptive and correlational analysis of time-series data

**Results**
Anopheles gambiae species was the most abundant at Rukara (72.92%), and Mimuli (99.23%) sentinel sites. Fifteen different anopheline species were recorded at both sites. The abundance of mosquitoes has decreased tremendously over the study period. Malaria incidence has significantly reduced at the Mimuli site but remains high in the Rukara sentinel site. All mosquito species prefer biting outdoors (mean endophagic index < 0.5). At both Rukara and Mimuli sites, malaria cases peaked 1 month and two months following peaks in abundance of an. gambiae (P-Value <0.05). At Rukara site, cases nadired 1 month (P-Value < 0.0001) and two-months (P-Value < 0.0001) following peaks in an. funestus

**Conclusions**
Results highlight the importance of an. gambiae as malaria vectors in Rwanda, predominantly bite outdoors, and the effect of their abundance on malaria incidence can be anticipated. Indoor interventions like Indoor Residual Spraying and mosquito nets alone will not control malaria. We recommend new approaches that reduce outdoor mosquito density and bites, and further studies to fully understand the factors of malaria transmission in the Rukara zone

## 1095

## Profile of molecular markers of Plasmodium falciparum resistance to Sulfadoxine-Pyrimethamine in southern Brazzaville, Republic of Congo, September 2021

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**Keywords**
Plasmodium falciparum, Sulfadoxine-Pyrimethamine, mutation, Republic of the Congo.

**Introduction**

Growing resistance of Plasmodium falciparum to Sulfadoxine-Pyrimethamine threatens the effectiveness of the intermittent preventive treatment during pregnancy with Sulfadoxine-Pyrimethamine (IPTp-SP) in malaria endemic areas. WHO recommend discontinuation in case of ineffectiveness as determined by over 95% and 10% prevalence of K540E and A581G mutant respectively, or high prevalence of quintuple mutant with combine the triple dhfr (N51I, C59R, and S108N) and double dhps (A437G and K540E) mutants. The objective of this study was to determine the prevalence of molecular markers of P.falciparum resistance to SP in the parasite population circulating in Brazzaville, in the Republic of Congo.

**Methods**
This was a cross sectional study carried out from February 2021 to September 2022 with blood samples collected from 138 microscopic malaria positive individuals, recruited in a health center of the Madibou District in Brazzaville. Qiagen kit was used for the parasite DNA extraction, and Restriction Fragment Length Polymorphism used for the detection of single nucleotide mutation within the dhfr and dhps genes of the parasite.

**Results**
High prevalence of mutations was reported for dhfr gene: N51I (98%), C59R (29.9%), S108N (99.3%), N164L (0.0%), and dhps gene: A437G (82.5%), K540E (12.6%), A581G (18.4%). The prevalence of dhfr triple mutant (N51I+ C59R + S108N) and dhps double mutant (A437G + K540E) were 34.0% (47/138) and 20.3% (28/138) respectively, while the quintuple mutant (N51I+ C59R + S108N + A437G + K540E) was reported for 7.2% (10/138) of the participants. Only one participant was found with all the mutations. The mutation distribution did not differ significantly nor between febrile and afebrile participants, neither across age groups.

**Conclusions**
These results indicate high prevalence of mutations within the dhfr and dhps genes of P. falciparum in the Madibou District in the Republic of Congo, which might threaten the effectiveness of IPT-SP in this area.

# Track 9: Non-communicable diseases – a growing public health threat in Africa

# Oral

## 190

## Can childhood stunting and wasting be reduced in drought-prone areas in Ethiopia? A cohort study

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
undernutrition; water access; Productive Safety Net Programme

**Introduction**
Ethiopia has over the years experienced severe famines and periods of serious droughts. As such, malnutrition remains major public health problem. The aims of this study were to estimate seasonal variations in child stunting and wasting, and identify factors associated with these both forms of child malnutrition in drought-prone areas.

**Methods**
This cohort study was conducted among a random sample of 909 children in the rural southern Ethiopia. We followed the same children for one year (2017-2018) with quarterly repeated measurements of their outcomes, height-for-age and weight-for-height indices (Z-scores). We used linear regression models to analyse both outcomes with baseline factors (e.g., household participation in social safety net program, drinking water access, and latrine possession) and some time-varying factors (e.g., household food insecurity).

**Results**
Child wasting rates varied with seasonal household food insecurity ($_{\chi}2$ trend=15.9, P=0.001), but the stunting rates did not. Household participation in social safety net program was associated with decreased stunting (P=0.001) and wasting (P=0.002). Besides to its association with decreased wasting (P=0.001), protected drinking water access enhanced the association between household participation in social safety net programme and decreased stunting (P=0.009). Absence of a household latrine (P=0.011), lower maternal education level (P=0.001), larger family size (P=0.004) and lack of non-farming income (P=0.002) were associated with increased child stunting.

**Conclusions**
Seasonal household food insecurity could contribute to child undernutrition in rural Ethiopia, suggesting the population vulnerability to food insecurity. Strengthening community-based food security programs such as the Ethiopian government's social safety net program could help reduce child undernutrition in drought-prone areas. Yet, improving clean water access and sanitation could also reduce child undernutrition.

## 667

## The magnitude of non-adherence and its associated factors among Type-2 DM patients on oral anti-diabetic medication attending public hospitals in Addis Ababa, Ethiopia, 2022: a facility-based cross-sectional study

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Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Medication non-adherence, Oral anti-diabetic, Type 2 Diabetes Mellitus, Morisky's Medication Adherence Scale

**Introduction**
Low adherence to prescribed anti-diabetics accounts for 30% to 50% of treatment failures, which causes damage to multiple vital organs, prolonged hospitalization, increased cost of health care, and decreased productivity of society. This indicates that there should be major public health measures taken in addition to the provision of medical services to improve the adherence rate. The objective of this study was to determine the magnitude of non-adherence to oral anti-diabetic medications and the contributing factors among T2DM patients, in Addis Ababa, Ethiopia, 2022.

**Methods**
A hospital-based, quantitative cross-sectional study was conducted at 3 public hospitals. The calculated sample size of the study was 367. Systematic random sampling was used to select participants who fulfilled the eligibility criteria, which were; being above the age of 18, having a follow-up at the selected public hospitals, and taking oral anti-diabetic medications. Morisky medication adherence scale (MMAS-8) questionnaire tool was used to determine medication non-adherence. The data entry and analysis were carried out using SPSS. Statistically significant associated factors with medication adherence were determined using multivariable logistic regression models.

**Results**
Among 367 participants, 130 (35.4%) of them were non-adherent. Being male [2.998 (1.533-5.866)], having a family history of DM [6.046 (3.038 – 12.030)], use of alternative medicine [9.280 (4.335 – 19.866)], lacking moral support [8.993 (3.882 – 20.832)], poor relationship with health care provider [3.454 (1.023 – 11.664)], presence of medication side effects [2.383 (1.110 – 5.115)], and not receiving education about DM [(1.114 – 27.775)] were significantly associated with medication non-adherence.

**Conclusions**
The non-adherence rate identified in this study was higher compared to most other studies done in the country. Interventions should mainly focus on providing consistent education to society in regard to medication side effects, use of alternative medicine as well as encouraging family members to be a source of emotional strength for the patients.

## 753

## Prevalence of hypertension and associated factors among people living with HIV - a cross-sectional study in a rural hospital, Rwanda

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Hypertension, PLHIV, and ART, Rwanda

**Introduction**
Globally, hypertension is an emerging public health issue among people living with HIV (PLHIV). Yet, little information is documented about the magnitude of hypertension and its associated factors among PLHIV in Sub-Saharan Africa. We determined the prevalence of hypertension and associated risk factors among PLHIV, who have been attending a rural district hospital in Rwanda.

**Methods**
A cross-sectional study was conducted in a rural district hospital located in Southern Rwanda from January to December 2020. The study included PLHIV aged 18 years and above, who were selected using systematic random sampling. Hypertension was defined as increased systolic and or diastolic blood pressure or the use of anti-hypertensive medicines. Logistic regression was performed to determine factors associated with hypertension.

**Results**
The study enrolled 386 PLHIV. The mean age was 47 years (18 – 82 years). The prevalence of hypertension was 29.8%. The longer duration of

antiretroviral treatment (ART) greater than five years (AOR 2.9, 95% CI 1.23-6.77) and overweight (AOR 2.2, 95% CI 1.32-3.65) were associated with increased risks of hypertension whereas the underweight (AOR 0.2, 95% CI 0.05-0.58) was a protective factor against developing hypertension.

**Conclusions**
Hypertension was highly prevalent among PLHIV, who have been followed up in a rural district hospital located in Southern Rwanda. Patients with a longer duration on ART and overweight were at higher risks of developing hypertension while those with underweight seemed to be protected against hypertension. These findings highlighted the need for strengthening the current HIV surveillance system to mitigate the burden of hypertension among PLHIV.

## 835

## Client Perspectives on integrating facility and community-based HPV self-sampling for cervical cancer screening with family planning in Malawi, 2020-2021: a qualitative study

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Cervical cancer screening, Family Planning, HPV self-sampling, Thermo ablations, Malawi

**Introduction**
Cervical cancer disease is preventable through early screening, but access to cervical cancer screening (CCS) remains a challenge in Malawi. Integration of CCS with family planning (FP) services through HPV self-sampling may increase screening coverage. We aimed to evaluate the motivations, experiences, and satisfaction of women who underwent HPV self-sampling in Malawi between 2020-2021.

**Methods**
We purposively sampled and interviewed 29 women who underwent HPV self-sampling for CCS in one of two different CCS-FP models in Malawi. Model 1 involved only clinic-based HPV self-sampling, whereas Model 2 included both clinic-based and community-based HPV self-sampling through community health workers. IDIs followed a semi-structured guide and were audio-recorded, transcribed and translated into English for analysis. Data were analyzed using Nvivo 12 software and thematic content analysis.

**Results**
Both models created demand for CCS and reduced costs for participants. Participants screened in the community had reduced transport costs for screening, while those screened at the clinic could access both CCS and FP services at a single visit. Most women felt that HPV self-sampling was simple and ensured privacy. Participants from both models were motivated to undergo CCS due to concern about late cancer diagnosis, gynecological symptoms, HIV status and the availability of same day treatment. Participants further expressed satisfaction with making decisions without having to consult spouses, and none reported experiencing social harm following result disclosure. Participants screened in the community felt it offered more privacy since samples were mainly collected within their homes, compared to in public toilets or consultation rooms at the clinics.

**Conclusions**
Participants were satisfied with HPV self-sampling, and both models were seen to have made access to CCS more convenient and cost-effective for women. Our findings suggest that from the patient perspective, CCS and FP services can be integrated in Malawi through HPV-self sampling to improve uptake for CCS.

## 952

## Body Weight Misperception and its Association with Weight Control Behaviors and Mental Health in Adolescents in Secondary Schools in Cameroon: Global School Based Health Survey 2018

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Weight misperception, Adolescent, Mental health, Weight control behaviors, Cameroon , Secondary schools.

**Introduction**
Introduction:  A wrong body weight perception is directly related to depression, suicidal ideation and eating disorders stemming from healthy weight control attempts. It is a powerful risk factor for incident obesity; a barrier to Obesity and related Non Communicable Disease prevention. Little to nothing is known about body weight misperception in adolescents in Sub-Saharan Africa. Investigating its prevalence and associated factors will help to design weight awareness and management programs to help address this rising concern; an efficient way of ameliorating weight challenges and obesity prevention.

**Methods**
Methods: Cross sectional study. Body weight perceptions, weight control behaviors and mental health were measured in 3,153 adolescents, aged 12–19 years, who participated in the 2018 Cameroon Global School-based Health Survey (GSHS). The mental health and weight control characteristics of the wrong perception and accurate perception groups were compared through multiple logistic regression analysis.

**Results**
Results: Among 3,153 adolescents, 1062 (33.7 %) misperceived their weight. Weight misperception was more common among adolescents who were overweight or obese ($p < 0.001$).  The female adolescents were more likely to overestimate their body weight ($p < 0.001$). Compared to the accurate body weight perception group, gender-adjusted ORs, Adolescents who misperceived their weight are more likely to eat less calories (OR: 1.34; 95%CI: 1.08-1.68) , use laxatives (OR: 1.64 95%CI: 1.14-2.36) to lose weight or avoid to gain weight, attempt suicide: 1.46 (1.07–1.99) and lose concentration from worrying too much: 1.19(1.02-1.39) .They are less likely to use healthy weight control behaviors only (OR: 0.77; 95%CI: 0.61-0.97).

**Conclusions**
Conclusion: Interventions to assist adolescents to gain realistic weight perception and healthy weight control behaviors may be beneficial. Particularly, more attention needs to be given to female adolescents, who are more likely to overestimate their body weight compared to their male counterparts.

## 1417

## Cervical cancer screening and treatment cascade among women at five health facilities in Malawi, from March to September 2022

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
cervical cancer, screening, histology, treatment

**Introduction**
Cervical cancer is a leading cause of cancer-related deaths in women worldwide despite being preventable and treatable when detected early and managed effectively. Malawi recommends screening all women aged 25-49 years with Visual Inspection with Acetic acid (VIA) being the most common screening method, rapid treatment of pre-cancerous lesions using ablative methods, and referral for large lesions. Our objective was to evaluate cervical cancer screening and the treatment cascade.

**Methods**
Data were analyzed from a prospective observational study being implemented in four district hospitals and one urban health center in Malawi where all enrolled women receive both Human Papillomavirus (HPV) testing and VIA screening in one visit. Those testing positive on any test had a biopsy collected from the cervix for histology review and those who were VIA-positive or abnormal on histology received treatment according to national guidelines. Women were enrolled from March to September 2022.

**Results**
We enrolled 4,404 women, of which 3,126 received a documented HPV test result: 1,002 (32%) HPV-positive, 2,118 (68%) HPV-negative and 6 (0%) indeterminate. 4,038 (92%) women tested VIA-negative, 339 (8%) VIA-positive and 27 (1%) were suspected of cervical cancer. 399 women were eligible for treatment – 339 VIA-positive, 47 histology positives, and 13 by clinician discretion. A total of 150 (37%) have been treated – 122 (81%) with thermal ablation and 28 (19%) with large loop excision of the transformation zone; an additional 6 women were referred. 2,045 (57%) were eligible for biopsy collection, out of which 1,364 (67%) have been collected. Follow-up of women eligible for treatment and biopsy collection is ongoing.

**Conclusions**
Ensuring VIA-positive and other high-risk women receive timely and appropriate treatment is critical to reducing mortality from cervical cancer. Increasing capacity of health facilities to strengthen same-day services of VIA, biopsy, and treatment will save the lives of many women.

## Poster

### 138

### Healthcare Workers' Knowledge and Resource Availability for Care of Sickle Cell Disease in Dar es Salaam, Tanzania

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Sickle cell disease, knowledge, healthcare workers, resources, health facilities, Tanzania

**Introduction**
Sickle cell disease (SCD) is a global public health priority due to its high morbidity and mortality. Early diagnosis and linkage to care have been shown to prevent 70% of SCD-related deaths but require knowledge among healthcare workers and availability of resources at health facilities. In Tanzania, data on these critical determinants is lacking. This study aimed to assess healthcare workers' knowledge and resource availability for care of SCD at health facilities in Dar-es-Salaam, Tanzania.

**Methods**
A cross-sectional study was conducted between December 2020 and February 2021 among 490 nurses and clinicians at Regional Referral Hospitals (Temeke, Amana, and Mwananyamala) and Muhimbili National Hospital in Dar-es-Salaam, Tanzania. Data was collected using pre-tested structured questionnaire consisting of 13 knowledge questions (good knowledge if total score >7) and inventory checklist to record available resources. Pearson's $\chi 2$ was used to determine association

between level of knowledge and demographic factors. Multivariate logistic regression was used to ascertain the strength of associations. P-values < 0.05 were considered statistically significant

**Results**
Of the 490 participants (median age 28 years [IQR=26-35]), only 25.1% had good knowledge on SCD. The odds of good knowledge was 82% lower in nurses than clinicians (AOR= 0.177; 95% CI: 0.090, 0.349; p <0.001); 95% lower in Diploma than Master's degree holders (AOR = 0.049; 95% CI: 0.008, 0.300; p = 0.001) and 4.6 times higher in those with 5–9 years than ≥10 years of experience (AOR=4.564; 95% CI: 1.341, 15.525; p=0.015). The regional-level hospitals lacked diagnostic tests and Hydroxyurea therapy.

**Conclusions**
There was general lack of knowledge on SCD among healthcare workers and limited availability of resources for the diagnosis and care of SCD, especially at regional-level hospitals. Efforts are needed for their improvement in order to reduce the morbidity and mortality due to SCD in Tanzania

## 392

## Correlates of Emotional Violence against Children in Rwanda

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Rwanda, Emotional Violence, Violence Against Children, Child Protection.

**Introduction**
In some countries, efforts to prevent violence against children are often hindered by the lack of national data on its prevalence and associated factors. Rwanda conducted her first survey on violence against children in 2016 to determine the prevalence of physical, sexual and emotional violence against children and youth in Rwanda. This study used data from the Rwanda Survey to examine patterns of emotional violence (EV) and associated, and to describe the profile of children who were emotionally abused.

**Methods**
A sample of 1,110 children drawn from the Rwanda Survey on Violence against Children and Youth was analyzed. Weighted descriptive statistical analyses were applied to describe patterns of the prevalence of EV against children. Factors associated with EV were investigated using logistic regression.

**Results**
Fourteen percent of children reported EV in their life time; and eleven percent reported experiences of EV within twelve months before the survey date. Parents topped the perpetrators of EV against children: fathers committed 29.0%, mothers committed 30.0%; stepmothers committed 12.4%, and stepfathers committed 3.4%. Female children (aOR:0.48[0.31-0.76]) and children with some trust in people from their communities (aOR:0.47[0.23-0.93]) were less likely to report EV. However, not attend school (aOR:1.79[1.09-2.92]), living with father only (aOR:2.96 [1.11-2.92]), not being close relationship with biological parents (aOR:7.18 [2.12-24.37]), living in larger households (aOR:1.81 [1.03-3.19]),not feeling safe in the community (aOR:2.56 [1.03-6.39]) increased the odds of EV.

**Conclusions**
EV against children is pervasive in Rwanda; and parents remain key actors in its occurrence. Children not attending school, children living with their fathers only, children without a close relationship with biological parents, children from larger households, children without a friend, and children not feeling safe in their communities were vulnerable to EV. A family-centered approach, promoting positive parenting, protection of vulnerable children is needed to reduce trends of emotional violence.

## 542

## Upregulated GATA3/miR205-5p Axis Inhibits MFNG Transcription and Reduces the Malignancy of Triple-Negative Breast Cancer

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
breast cancer; TNBC; MFNG; GATA3; miR205-5p; metastasis

**Introduction**
Triple-negative breast cancer (TNBC) accounts for approximately 20% of all breast carcinomas and has the worst prognosis of all breast cancer subtypes due to the lack of an effective target. Recent research from Washington University School of Medicine in St. Louis revealed that African American women with TNBC present higher mortality than white American women. Moreover, a number of studies showed the high frequency of TNBC across African countries. Therefore, understanding the molecular mechanism underpinning TNBC progression could explore a new target for therapy. While the Notch pathway is critical in the development process, its dysregulation leads to TNBC initiation. Previously, we found that manic fringe (MFNG) involves in the progression of breast cancer. However, the underlying molecular mechanism of MFNG upstream remains unknown. In this study, we explored the regulatory mechanisms of MFNG in TNBC.

**Methods**
We used advanced bioinformatics tools, nanotechnology, and molecular biology techniques including transwell and colony formation and luciferase assays to show the tumorigenic effect of MFNG in TNBC by promoting cell growth and migration, as well as Notch signaling activation.

**Results**
The mechanistic studies revealed that MFNG was a direct target of GATA3 and miR205-5p and demonstrated that GATA3 and miR205-5p overexpression attenuated MFNG oncogenic effects, while GATA3 knockdown mimicked MFNG phenotype to promote TNBC progression. Moreover, we illustrated that GATA3 was required for miR205-5p activation to inhibit MFNG transcription by binding to the 3′ UTR region of its mRNA, which forms the GATA3/miR205-5p/MFNG feed-forward loop. Additionally, our in vivo findings showed that the miR205-5p mimic combined with polyetherimide-black phosphorus (PEI-BP) nanoparticle remarkably suppressed the growth of TNBC-derived tumors which lack GATA3 expression.

**Conclusions**
Our study uncovered a novel GATA3/miR205-5p/MFNG feed-forward loop as a pathway that could be a potential therapeutic target for TNBC.

## 685

## The baseline quality of diabetes care among facilities empaneled in the Lagos state health scheme, December 2020.

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
diabetes, treatment guidelines, quality of care, health insurance, SafeCare

**Introduction**
Health insurance programs can improve access to care and population health if access is met with adequate quality of care (QoC). As Lagos State, Nigeria rolls out its health insurance scheme (LSHS), data on the QoC for patients with diabetes needed for actuarial and programmatic decisions are scarce. This study aimed to determine the level and correlates of the QoC provided to diabetic patients in Lagos State.

**Methods**
Data were collected during the baseline assessment for an impact evaluation of the Lagos State Health Scheme (LSHS). The 84 study facilities were selected via two-stage stratified random sampling among eligible facilities. QoC was defined as receipt of guideline-recommended care processes, and QoC indicators were derived from literature review and expert voting. Clinical data were extracted from patient medical records. We estimated the proportion of patients who received each recommended care process and summarized the percentage of care processes each patient received using a composite QoC score. We assessed the correlates of QoC using mixed effects multiple linear regression.

**Results**
The analysis encompassed 615 patients, out of which 57.1% were female, and the mean age was 55.3 years (SD:11.8). Of the 43 facilities included, 60.5% were LSHS facilities, 44.2% participated in SafeCare; 65.1% were secondary, and 55.8% were private facilities. Recommended diabetes care was particularly low for eye examination or referral (4.4%), foot examination (1.8%), and physical activity counseling (6.8%). The diabetes QoC score per patient was 26.8% (95% CI: 13.2 -40.6). Receiving care at secondary health facilities (β:10, 95%CI: 0.05–20) and public facilities (β:10, 95%CI: -1.1 – -22) were marginally associated with higher quality scores.

**Conclusions**
The quality of diabetes care in Lagos health facilities empaneled in LSHS is generally low. This baseline provides valuable information for quality improvement interventions, such as those by SafeCare, currently being implemented with LSHS.

## 803

# Assessment of Sedentary Behaviour and its Health Consequences Among Tertiary Institution Staff in Nigeria, May 2022

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Sedentary behaviour, cardiometabolic diseases, assessment, tertiary institution, non-communicable diseases

**Introduction**
Sedentary behaviour (SB) is a lifestyle characterized by low-energy expenditure during wake-periods and is an independent predictor of cardiometabolic risks even if physical activity guidelines are met. Cumulative evidence suggests the role of extended daily sedentariness (4–8 hours) in non-communicable disease (NCD) development, which accounts for 71% of global mortality. This increases the risk of declining cardiometabolic health such as type 2 diabetes, cardiovascular disease, obesity. This study assessed SB and its association with cardiometabolic markers among the study participants.

**Methods**
A cross-sectional study was conducted on 100 employees of Adeleke University, Osun State, between January and May 2022 by multistage sampling technique. Data were collected using a semi-structured, self-administered Employees Sedentary Behavior Questionnaire (ESBAQ). Serum and urine samples of the participants were also taken to conduct quantitative biochemical analysis.

Descriptive and inferential statistics were used where necessary, with a level of significance set at 5%.

**Results**
The age range of respondents was 22 and 65 years. Majority of the respondents engaged in high SB (sitting > 4 hours per day). Respondents significantly ($p < 0.0001$) spent more hours in office meetings or clerical duties (5.63 ± 1.37 (58.6%)) and using computers (5.79 ± 1.42 (39.6%)). Renal function and cardiometabolic risk markers such as urine creatinine ($p= 0.040$) and albumin-to-creatinine ratio ($p= 0.033$), lifestyle factors such as duration of regular walking breaks at work ($p= 0.028$), and anthropometric values such as body mass index ($p= 0.015$) were factors significantly associated with SB.

**Conclusions**
Conclusion: Office meeting or clerical duties and use of computers are the frequent SBs among tertiary institution employees and these behaviours were associated with cardiometabolic risk markers. Hence, prolonged sitting time could be a public health concern that needs to be addressed, especially when it is a primary cause for the onset of cardiometabolic diseases.

## 930

## Factors influencing dissemination and adoption of integrating cervical cancer prevention into reproductive health services in the Greater Accra Region, September 2020

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Dissemination, Adoption, Cervical Cancer, Integration, Implementation Science, Reproductive Health

**Introduction**
Cancers contribute to the high non-communicable disease burden globally. In Ghana, cervical cancer is the second leading cause of cancer-related deaths in females. Effective screening methods for preventing cervical cancer are available in Ghana, but coverage remains low. Ghana's health policy aims to improve coverage by integrating the screening and treatment of precancerous lesions into other reproductive health services (ICP_RHS); however, health facilities in Ghana have not adopted this innovation. The study aimed to identify the factors influencing the dissemination and adoption of ICP_RHS by health facilities in the Greater Accra Region from the perspective of multiple stakeholders.

**Methods**
This exploratory qualitative research was conducted in five health facilities purposely selected in four administrative areas in the Greater Accra Region of Ghana. Using tools guided by Rogers' diffusion theory and the consolidated framework for implementation research (CFIR), data were collected through 26 semi-structured interviews with district officers, facility leaders or supervisors and health care providers (doctors, nurses, midwives). Framework analysis was used to analyse the data.

**Results**
Participants highlighted facilitators of dissemination, including change agents, effective communication, good leadership, and supportive management style and skills. Factors influencing the adoption of ICP_RHS by facilities included perceived simplicity of the integrated approach, enactment of national policy or directive, demand for integration and availability of resources. Factors affecting adoption by individual providers included training and coaching, access to guidelines and provider perceptions and beliefs.

**Conclusions**
This study highlights the characteristics of the innovation, organisation and individual providers

that may influence the dissemination and adoption of the integrated cervical cancer screening and treatment innovation. Understanding these factors may be used to identify the most appropriate and context-relevant strategies to enhance the adoption of the ICP_RHS innovation with the aim to increase screening and treatment coverage.

## 994

## The epidemiology of End Stage Kidney Disease patients on maintenance dialysis in Botswana, 2012-2017 retrospective study

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
End Stage Kidney Disease, Dialysis, Hypertension, Diabetes, NCDs, Botswana

**Introduction**
End Stage Kidney Disease (ESKD) increases demand for kidney replacement therapy which is still scarce in Africa. This study describes the epidemiology of ESKD patients on maintenance dialysis in Botswana, identifying the most affected groups and causes.

**Methods**
A 6-year retrospective cohort study of all incidental ESKD patients aged ≥ 18 years old on maintenance haemodialysis (HD) and peritoneal dialysis (PD) from 2012-2017 was conducted at major Botswana referral hospitals, Princess Marina Hospital and Nyangabgwe Referral Hospital. Data was also sought from private facilities where haemodialysis is outsourced. Medical records were reviewed from January-July 2022. Descriptive statistics were used to analyse the data. Ethics approval was obtained from University of Botswana and Ministry of Health.

**Results**
There were 378 patients enrolled. Majority 224/378 (59.3%) were males and median dialysis initiation age was 49 (IQR:37-59) years old. Most affected age group was 35-54 years 178/378 (47.1%) and least ≥65 years 38/378 (10.1%). Commonest cause of ESKD was hypertension 160/378 (42.3%) then diabetes/hypertension comorbidity of 77/378 (20.4%). Glomerulonephritis, Poly Cystic Kidney Disease, HIV nephropathy and lupus had proportions of 6/378 (1.6%) each while obstructive nephropathies were 17/378 (4.5%), diabetes only 15/378 (4.0%), traditional medicine 5/378 (1.3%), renal calculi 2/378 (0.5%), other 13/378 (3.4%) and unspecified 65/378 (17.2%). The prevalence of HIV was 132/378 (34.9%). HD was the initial modality for most patients 253/378 (66.9%) and rate of PD to HD switch was 54/125 (43.2%) mainly attributed to peritonitis 18/54 (33.3%).

**Conclusions**
ESKD in Botswana mainly affects males and the young and middle-aged population. The leading causes being hypertension and diabetes. HD is the predominantly used modality and amongst those starting with PD, peritonitis is the main contributor to modality switch. There is need to invest in the prevention and control of hypertension and diabetes to reduce the incidence of ESKD and dialysis requirement in Botswana.

## 1111

## PERIODONTAL DISEASE AND PREECLAMPSIA AMONG PREGNANT WOMEN IN SELECTED RWANDA REFERRAL HOSPITALS

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Pregnant women, Preeclampsia, Periodontitis, Referral Hospital, Rwanda

**Introduction**
Background: There is an increased mortality in pregnant women due to various non-communicable diseases, including gestational hypertension. Recent studies have indicated that the presence of periodontal diseases during pregnancy could increase the risk of developing preeclampsia which in turn increases adverse pregnancy outcomes for the mother and child. Thus, there is need to assess whether periodontitis may constitutes a risk factor for preeclampsia. The study aims to assess the association between periodontitis and preeclampsia among pregnant women at University Teaching Hospital of Kigali and Ruhengeri Hospital in Rwanda.

**Methods**
Methods: A case-control study was carried out at two referral hospitals in Rwanda including 156 (52 preeclamptic and 104 non-preeclamptic pregnant women aged ³18 years). Periodontitis was defined as a chronic infection that destroy the teeth supporting tissues to the alveolar bone. Preeclampsia was defined as blood pressure ³ 140/90mmHg diagnosed after 20 weeks of gestation and proteinuria of ³300mg/mml in 24 hours of urine collection. Controls were healthy pregnant women. Outcomes measure for periodontitis were pockets depths, bleeding on probing, and visible calculus measured in both preeclamptic and non-preeclamptic groups.. The odd ratio for periodontitis with 95% confidence interval and significance was reported at p>0.05.

**Results**
Results: The present study revealed that the overall prevalence of periodontitis was 46.79%. The multivariable analysis indicated that periodontitis was significantly associated with a high risk of developing preeclampsia (OR=3.11, 95% CI: 1.41-6.85). Alcohol consumption among pregnant women was almost 4 times higher at risk of developing preeclampsia (OR=3.91, 95% CI: 1.25-12.23).

**Conclusions**
Conclusion: These results revealed that periodontitis was significantly associated with preeclampsia amongst pregnant women. Further clinical studies are needed to determine the possible confounding factors, the severity of diseases as well as the sub-gingival microbial composition related to preeclampsia. Therefore, it will support the establishment of routine periodontal care for pregnant women in Rwanda.

## 1136

## Alcohol use disorder among healthcare professional students: A structural equation model describing its effect on depression, anxiety, and risky sexual behavior.

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
anxiety, depression, alcohol use disorder, health professional students

**Introduction**
Mental health problems such as depression, anxiety, and alcohol use disorders (AUD) are among the leading causes of disability worldwide. Previous studies have established that university students consume higher levels of alcohol than their non-university peers. These maladaptive

alcohol use patterns have been documented to result in risky sexual behaviors and may result in anxiety and depressive disorders. Given the syndemic occurrence of these disorders and their negative impact on young adults, it was essential to study this relationship to guide the implementation of interventions for effective reduction in the burden of these disorders.

**Methods**

This was a cross-sectional study among 351 healthcare university students across three Ugandan public universities between November and December 2021. The online survey was hosted on Kobo and captured sociodemographic characteristics, risky sexual behavior, AUD, generalized anxiety disorder, and depression. Structural equation modeling was used to describe the relationship between these variables using RStudio.

**Results**

Of the study participants, 11% (37/351) had Alcohol Use Disorder, 33% (117/351) had depressive symptoms, and 32% (111/351) had symptoms of anxiety. A model describing the relationship between these variables fit well both descriptively and statistically [$\chi 2$ = 44.437, df = 21, p-value = 0.01, CFI = 0.989, TFI = 0.980, RMSEA = 0.056]. All measured variables fit significantly and positively onto their respective latent factors. AUD was found to be a significant predictor of risky sexual behavior ($\beta$ = 0.381, P < 0.001), depression ($\beta$ = 0.152, P = 0.004), and anxiety ($\beta$ = 0.137, P = 0.001).

**Conclusions**

AUD, depression, and anxiety are still significant burdens in this student population. There's a need to consider screening for comorbid anxiety and depression in students reporting AUD. Efforts should be focused on the effect of AUD on risky sexual behavior, and continued health education is still required among health-professional students

## 1171

## Prevalence and Correlates of Suicidal Behavior among chronic care patients with depressive symptoms in Neno, Rural Malawi, September 2022

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**Conference Track**

Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**

Suicidal ideation, depression, chronic care, mental health

**Introduction**

Suicidal behavior encompasses suicidal ideation, suicide attempt, and completed suicide. Globally low- and middle-income countries account for 77% of all completed suicides. Lifetime prevalence suicidal ideation in the general population globally ranges from 3.1% to 56%, in Malawi, prevalence of suicidal behavior among adults is 7.9%. We investigated prevalence and correlates of suicidal behavior among patients receiving care for chronic health conditions with depressive symptoms in Neno District, Malawi.

**Methods**

As part of a randomized controlled trial to treat major depressive disorder in Neno District, Malawi, 2,240 chronic care patients were screened for depression using the Patient Health Questionnaire (PHQ-9). Those who expressed suicidal ideation were further assessed on a suicidality assessment tool. We conducted univariate analysis to determine the prevalence of suicidal behavior, as well as multivariable logistic regression analyses to investigate predictive sociodemographic characteristics.

**Results**
The overall prevalence of suicidal behavior was 10.1% (226) among chronic care patients with depressive symptoms. This included a prevalence of 10.1% for any suicidal ideation, 0.8%(17) prevalence for one or more prior suicide attempts, and 2.6% (58) for having an existing suicide plan. Factors associated with suicidal behavior included: younger age (odds ratio [OR] 0.985, p=0.009), being female (OR (male), 0.647, p=0.03), and elevated depression symptomology (OR, 1.212, p<0.001).

**Conclusions**
Prevalence of suicidal behavior is elevated among adults with chronic care conditions and depressive symptoms in Malawi: roughly 1 in 10 individuals demonstrate these characteristics. Timely, targeted interventions should be implemented to address this problem in Neno District and beyond

## 1191

## Oral hygiene practices among adults in Burkina Faso: Sociodemographic determinants and associations of substances' uses and hyperglycemia with unhealthy practices

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**Keywords**
Oral hygiene practices; Sociodemographic determinants; Substances' use; hyperglycemia; WHO-STEPS; Burkina Faso

**Introduction**
Sociodemographic parameters are the driving determinants for oral hygiene practices while unhealthy practices are increasingly identified as risk factors for non-communicable diseases. The present study aimed to describe the sociodemographic determinants of healthy oral hygiene practices, and to report whether alcohol and/or tobacco use and hyperglycemia were associated with practices among Burkinabè adults.

**Methods**
This descriptive, cross-sectional study included 4667 adults selected through multistage cluster sampling performed during the first WHO STEPS survey conducted in 2013 in Burkina Faso. The practices we considered were the frequencies of tooth cleaning, the fluoridated toothpaste use and the dentist visit within the past-six months. Data on self-reported alcohol and tobacco consumption, and measured fasting blood glucose (FBG) were included. We performed chi-squared test and logistic regressions.

**Results**
Individuals who cleaned teeth at least twice a day represented 31.4%; those who used fluoridated toothpaste were 25.6% and 2.1% have visited a dentist. With the highest odds-ratio, only being educated was a favorable factor for each of these healthy hygiene practices. Besides, 38.8% used either alcohol or tobacco and 8.4% had raised FBG. After adjusting for socio-demographic factors, alcohol and/or tobacco use was an unfavorable factor for tooth cleaning at least twice a day [aOR=0.6 (0.5-0.7) p<0.001]. Moreover, raised FBG was negatively associated with cleaning tooth at least twice a day [aOR=0.7 (0.5-0.9) p<0.01] or the use of fluoridated toothpaste [aOR=0.7 (0.6-0.9) p<0.05].

**Conclusions**
Healthy practices were infrequent. Oral health education in addition to cardiovascular risk factor reduction should be efficiently integrated in the behavioral lifestyle interventions' strategies for the non-communicable diseases' prevention.

## 1648

## Risk Factors for Non-Communicable Diseases among adults in Rwanda: Results from the STEPS Survey 2021

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**Conference Track**
Track 9: Non-communicable diseases – a growing public health threat in Africa

**Keywords**
Risk factors, Non Communicable Diseases, Rwanda

**Introduction**
The mortality from Non-Communicable Diseases (NCDs) continues to rise, particularly in resource-constrained countries, where 85% of premature deaths are observed. It is critical to continuously monitor the prevalence of modifiable risk factors to inform and evaluate national NCDs control interventions. In 2021, we conducted the second Rwanda NCDs Risk factors study also known as STEPS Survey that aimed at assessing the magnitude of major risk factors of selected NCDs in the Rwandan population.

**Methods**
A population-based nationally representative cross-sectional survey was conducted between November and January 2022. A standardized WHO STEPwise approach was used to collect data among 5,762 eligible participants aged 18 to 69 years selected from all 30 districts of the country through a multi-stage cluster sampling strategy. The data collection was done using the eSTEPS and Epi Info statistical software helped to make the analysis.

**Results**
Of the 5,676 participants; 2,130 (37.5%) were men and 3546 (62.5%) were women. The prevalence of tobacco smoking was 7.4% (95% CI: 6.2-7.9) with a significantly higher prevalence in males. 48.1% (95% CI: 46.1-50.0) of participants were alcohol drinkers and 3.4% of them binged alcohol during the past 30 days. 89.4% (95% CI: 88.0-90.8) of Rwandans were consuming less than five servings of vegetables and fruits per day and the average daily salt consumption was estimated at 8 grammes. Only 4.6% (95% CI: 3.7-5.5) of Rwandans did not engage in the WHO recommended amount of physical activity.

Overweight (BMI ≥ 25) was found in 18.6 % (95% CI: 17.1-20.1) of participants with women more affected than men. The prevalence of high blood pressure and high blood sugar was respectively16.8% (95% CI: 15.6-18.0) and 2.9% (95% CI: 2.1-3.8).

**Conclusions**
A good number of Rwanda are still leaving with a variety of major NCDs risk factors, continuous prevention efforts are needed supported by a multi-sectoral national coordination mechanism.

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