The abstracts in this publication were edited and officially cleared by the respective authors and their organizations. Therefore, TEPHINET is not responsible for the content or editorial quality of this material. The findings and conclusions in these abstracts are those of the authors and do not necessarily represent the views of TEPHINET or any of our conference sponsors.
Table of Contents

This PDF is interactive. Click on a section title to navigate to that section in this book.

i. Acknowledgements

ii. Welcome Message from TEPHINET

iii. Welcome Message from the Epidemic Intelligence Service

iv. Conference Committees

v. Thank You to Our Partners

vi. Abstract Reviewers

vii. List of Awards

ix. Award Selection Procedures

xii. TEPHINET Travel Grant for Environmental Epidemiology for Planetary Health

xv. Abstract Introduction and Color Key for Poster Presentations

xvi. Schedule of Oral and Poster Presentations

1. Abstracts
Thank you to the following organizations for providing funding support to this conference and/or its Interactive Learning Sessions:

- The Task Force for Global Health
- CDC
- World Health Organization
- Ending Pandemics
- CDC Foundation
- LSTM
Dear Partners and Friends,

Greetings and welcome to the tenth TEPHINET Global Scientific Conference, the first since my tenure as TEPHINET Director began in August. This conference is a new arrival to Atlanta, as am I; for the first time, TEPHINET is holding this biennial event in the United States, in a city that has become a major global public health hub over the past few decades. Atlanta is home to the Centers for Disease Control and Prevention (CDC), The Task Force for Global Health (TEPHINET’s parent organization), and several other key players in public health. As the theme of this year’s event is, “The Global FETP Enterprise: Applied Epidemiology in the 21st Century,” it is fitting that we are gathered in the birthplace of the Epidemic Intelligence Service (EIS), the prototype for Field Epidemiology Training Programs (FETPs) worldwide.

What exactly do we mean by “the global FETP enterprise”? As our Tuesday plenary panelists will explain, this term reflects a reframing of the overall FETP initiative as a true, multi-partner global enterprise with numerous leaders, stakeholders, implementing partners, and funders. In June 2018, participants from TEPHINET and its network of programs and partners convened at a meeting organized by The Task Force for Global Health to develop a roadmap for building enhanced, sustainable global applied epidemiological capacity through FETPs. The guiding vision that emerged states that, “Every country in the world has the applied epidemiology capacities needed to protect and promote the health of its own population, and to collaborate with others to promote global health.”

Over the next week, we will network and learn with hundreds of field epidemiologists from around the world who are at the front lines of protecting and promoting health. We are facing an important moment in the development of epidemiology, with an increased commitment to One Health and stronger focus on social and environmental risk factors for disease, increased recognition of FETP as essential to global initiatives by the World Health Organization (WHO), and an ever-expanding set of tools to ensure better surveillance and rapid response capacity for epidemic control. I look forward to learning along with our attendees and, in particular, hearing our more than 200 oral and poster presenters, who are all fellows or graduates of FETPs.

I sincerely thank all of our planning partners, sponsors, and exhibitors for their support of this event and wish all of our participants an excellent week filled with insights and inspiration for your future work.

Sincerely,

Carl Reddy, MB.BCh, FCPHM, M.Sc. (Epi)
TEPHINET Director
Welcome Message from the Epidemic Intelligence Service

Dear Colleagues,

It is an honor to welcome you to Atlanta, Georgia, the home of the U.S. Centers for Disease Control and Prevention (CDC). As the field epidemiology training program for the United States, CDC’s Epidemic Intelligence Service (EIS) is excited to co-host the 10th TEPHINET Global Scientific Conference, The Global FETP Enterprise: Applied Epidemiology in the 21st Century. Together with our sibling program, CDC’s Field Epidemiology Training Program (FETP), and TEPHINET we expect to have an inspirational week of scientific sharing, learning, and networking.

While you are attending the conference, please make time to meet and learn about the many amazing people from around the world all committed to strengthening the public health workforce. It is a unique opportunity to be surrounded by people committed to training, learning, and public health. Take a moment to introduce yourself to the person sitting next to you. Share stories and learn about each other’s experiences and work. When attending the presentations, please remember this conference features the work of trainees—be sure to ask questions that encourage discussion and learning. Lastly, if you get a chance please take time to explore the city of Atlanta. Atlanta is home to many landmarks of the civil rights movement in the United States. Atlanta is also considered by some to be the public health capital of the world, so plan ahead to meet with colleagues and visit the CDC museum, Task Force for Global Health, Rollins School of Public Health, American Cancer Society, or The Carter Center and Presidential Library and Museum, just to name a few.

The EIS program is grateful for the opportunity to have the TEPHINET conference in our backyard. With the conference in Atlanta, I am thankful that many of our EIS officers, alumni, and staff can attend. By attending, they will learn about the work of other FETP trainees, meet with you and exchanges ideas, and share CDC’s work. It is a tremendous honor and responsibility to be part of TEPHINET. Through the work of our EIS officers, we will have on display our new training on data visualization and emphasis on how to more effectively communicate scientific findings and recommendations. The EIS program is committed to working with TEPHINET on how to provide the best training in applied epidemiology and ensure that our work leads to evidence-based public health action.

Welcome to Atlanta.

Respectfully,

Eric Pevzner, PhD, MPH
CAPT U.S. Public Health Service | Chief, Epidemic Intelligence Service (EIS)
Center for Surveillance, Epidemiology, and Laboratory Services
U.S. Centers for Disease Control and Prevention (CDC)
Conference Committees

TEPHINET Advisory Scientific Committee

Laura-Lee Boodram, PhD, MSc
Caribbean Regional Field Epidemiology and Laboratory Training Program, Caribbean Public Health Agency

Sahar El-Shourbagy, MD, MPH
Egypt Field Epidemiology Training Program, Ministry of Health and Population of Egypt

Angela Hilmers, MD, MPH, MS
TEPHINET, The Task Force for Global Health

Eric Pevzner, PhD, MPH
Epidemic Intelligence Service, Centers for Disease Control and Prevention

David Rodriguez, MD, MPH
Central American Regional Field Epidemiology Training Program, Executive Secretary of the Council of Health Ministers of Central America and the Dominican Republic

Cynthia Semá Baltazar, MPH
Mozambique Field Epidemiology and Laboratory Training Program, National Institute of Health of Mozambique

Carmen Varela Santos, DVM, MSc
European Centre for Disease Prevention and Control

Ad hoc members:

Reina Turcios-Ruiz, MD
Workforce and Institute Development Branch, Centers for Disease Control and Prevention

Seymour Williams, MD
Workforce and Institute Development Branch, Centers for Disease Control and Prevention

Conference Planning Committee

Miriam Alderman, MBA
TEPHINET, The Task Force for Global Health

Kip Baggett, MD, MPH
Workforce and Institute Development Branch, Centers for Disease Control and Prevention

Khurram Butt, MBA
TEPHINET, The Task Force for Global Health

Amber Ellithorpe
TEPHINET, The Task Force for Global Health

Karen Fain, MBA
TEPHINET, The Task Force for Global Health

Jessica Gourdet-Murray, MPH
TEPHINET, The Task Force for Global Health

Angela Hilmers, MD, MPH
TEPHINET, The Task Force for Global Health

Patrick O’Carroll, MD, MPH
The Task Force for Global Health

Babatunde Olowokure, MD, MPH, PhD
World Health Organization

Eric Pevzner, PhD, MPH
Epidemic Intelligence Service, Centers for Disease Control and Prevention

Carl Reddy, MB.BCh, FCPHM, M.Sc.(Epi)
TEPHINET, The Task Force for Global Health

Tina Rezvani, MA, MS
TEPHINET, The Task Force for Global Health
Thank You to Our Partners

TEPHINET extends our gratitude to the members of the standing advisory committees and working groups linked to our major initiatives which are being highlighted during the 10th TEPHINET Global Scientific Conference. These individuals represent many of our member field epidemiology training programs (FETPs), regional FETP networks, and other key partners.

This list is current as of October 21, 2019.

TEPHINET Advisory Board
Kashef Ijaz
Martyn Kirk
Oliver Morgan
Manoj Murhekar
Bashir Noormal
Lorna Perez
Carl Reddy
Mufuta Tshimanga
Carmen Varela Santos
Thomas Waite

TEPHINET Accreditation Working Group
Tarun Bhatnagar
Elizabeth David dos Santos
Fadzilah Kamaludin
Ioannis Karagiannis
Asmae Khattabi
Olivia Namusisi Kasenge
Carl Reddy
Reina Turcios-Ruiz

TEPHINET Global Accrediting Body
Nancy Binkin
Manuel M. Dayrit
Mohan Gupte
Latifat Ibisomi
Raina MacIntyre
Christopher N. Tetteh

FETP Learning Advisory Council
Nissaf Bouafif ép Ben Alaya
Richard Dicker
Lisa Jensen
Kabwebwe Honoré Mitonga
Boris Pavlin
Maria Concepcion (Conchy) Roces
Carmen Varela Santos

TEPHINET Advisory Scientific Committee
Laura-Lee Boodram
Sahar El Shourbagy
Angela Hilmers
Eric Pevzner
David Rodríguez-Araujo
Cynthia Semá Baltazar
Carmen Varela Santos

TEPHICConnect Steering Committee
Amrish Baidjoe
Jonas Brant
Olivia Namusisi Kasenge
Maria Consorcia (Conky) Quizon
Carl Reddy
Dana Shalabi
Ma. Nemia Sucaldito
Abstract Reviewers

TEPHINET thanks the following individuals for serving as voluntary abstract reviewers for this conference (this list is alphabetized by first name).

Abiodun Egwuenu
Achyut Bhattarai
Adalgisa Alcocer
Ahmed Ehsan
Ahmad Faudzi Yusoff
Aisha Abubakar
Aishat Usman
Aissatou Fall
Ajay Kumar Singh
Alethea De Guzman
Alex Riolexus Ario
Alice Namugamba
Alma Tostmann
Ambreen Chaudhry
Amol Patil
Amy Parry
Ana Maria Barrientos Llovet
Andrea Schertz
Andrew Terence Lam
Andronica Shonhiwa
Angela Huang
Ariane Halm
Asokan Govindaraj Vaithinathan
Augusto Lopez
Ayman Fahim
Basil Kaburi
Bernard Sawadogo
Bernice Harris
Bouchra Assarag
Carmen Sanchez-Vargas
Catalina Ramirez
Charles Akataobi-Michael
Chia-ting Su
Christine Blaser
Cibelle Cabral
Dalva De Assis
Daniella Azor
Dante Bugli
David Sugerman
Delia Akosua Benewah Bandoh
Diana Walteros
Diane Morof
Diogo Marques
Domenico Martinelli
Donewell Bangure
Eduardo Saad
Eman Aly
Erika Rossetto
Eriel Schillberg
Ernest Kateule
Esther Liliana Cuevas Ortiz
Faris Lami
Fernando Meneses-Gonzalez
Florence Tanguay
Frans Yosep Sitepu
Fredy Mendivelso
Gael Kouamen
Gamze Aktuna
Gaurab Roy
Geetharani Ramesh
Gemechu Bulcha
George Conway
Geresom Ilukor
Germain Bukassa Kazadi
Gladin Muchena
Gloria Inés Suárez Rangel
Grace Mongo Bua
Guilherme de Andrade Ruela
Hamed Hussein
Hamufare Dumisani Mugauri
Hao-Yuan Cheng
Henry Surendra
Hetani Mdose
Howard Nyika
Hsu Wu
Igor Ribeiro
Ioannis Karagiannis
Jacob Angara Sheehama
Jacqueline Espinosa
Jelena Ivanovic
Joanna Watson
Joseph Agboeze
Joy Ebonwu
Julie Harris
Karon Hammond-Collins
Karoon Chanachai
Krista Wilkinson
Lauren MacDonald
Lazarus Kuoonda
Leocadia Kwagonza
Lisa Hansen
Luis Fuertes
Maame Amo-Addae
Mabel Aworh
Mahmoud Azqui
Malick Masum Billah
Manickam Ponnaih
Manuel Mapue II
Marcelo Wada
Maria Alejandra Rüffer
Maria Bekker-Nielsen Dunbar
Maria Carmen Varela Santos
Maria Concepcion Roces
Mariani Geleshvili
Marie-Noëlle Billard
Martin Herbas Ekat
Marylene Brito Arduino
Maurice Owiny
Md Shamim Sarkar
Meena Kumari
Merissa Yellman
Michela Sabbatucci
Milena Rodriguez
Miracle Destine Apollon
Mirza Amir Baig
Mohammed Al Amad
Mohammed Al Khaldi
Moira Beery
Muhammad Hakim
Muhammad Saleem
Muhammad Shakir Balogun
Mumtaz Ali
Nadia Maria Romualdo-Tello
Nadia Phaimyr D Jn Charles
Ndaddilisaiya Endie Waziri
Ngoc Long Vu
Nikita Paula
Noorhaida Ujang
Noureddine Sakhr
Nyambe Sinyange
Olivia Nakwafila
Oluwaseun Ebenezer Oladeinde
Omar Segura
Oneida Castañeda-Porras
Otshudiandjeka Omasumbu Joseph Blaise
Pablo Grajeda
Patrick Kabwe
Peter Adedayo Adewuyi
Pedwinde Hamadou Seogo
Pinky Manana
Polyarche Tonye Hagbe
Priscila Souza
Priyakanta Nayak
Rachel Eidex
Rajesh Yadav
Randa Nooh
Richard Dicker
Robert Fontaine
Rosa Alicia Galeano
Saheed Gidado
Saika Aliyeva
Sandra Ocampo
Sarawathi Bina Rai
Sarika Desai
Shoab Hassan
Siddharudha Shivalli
Sophia Anyatowu
Stephen Lambert
Steven Ndugwa Kabwama
Suhaiza Sulaiman
Susan van den Hof
Sushma Choudhary
Syed Nadeem-ur-Rehan
Syed Wasif Javed
Tamkeen Ghafoor
Tanya Melillo
Tarun Bhatnagar
Thilaka Chinnayah
Thuy Phuong Nguyen
Touria Essayagh
Veronica Učakar
Vikki Carr De Los Reyes
Walid Alali
Wan-Chin Chen
Witold Mapanga
Xiomara Badilla
Yusof Mohamed Paid
Yuwono Sideharta
Zakir Hussain
The following awards will be presented during the Awards and Closing Ceremony on Friday, November 1, 2019.

**Presentation Awards**

**Best Oral Presentation**
by an FETP Intermediate or Advanced Fellow or Recent Graduate

**Best Poster Presentation**
by an FETP Intermediate or Advanced Fellow or Recent Graduate

**Best Oral Presentation**
by an FETP Frontline Fellow or Recent Graduate

**Best Poster Presentation**
by an FETP Frontline Fellow or Recent Graduate

**Best Oral Presentation**
by an FETP Alumnus/Alumna

**Dionisio Herrera Guibert Award for Best Applied Public Health Intervention**

**Photo Contest Awards**
First Place Winner
Second Place Winner
Conference Winner
Facebook Winner

---

**About the Dionisio Herrera Guibert Award for Best Applied Public Health Intervention**

**Purpose**
This award recognizes work that best exemplifies an outstanding public health intervention in which field epidemiology leads to improvements in a country’s surveillance system.

The award is given in honor of the late Dr. Dionisio José Herrera Guibert, who served as the director of TEPHINET from 2009-2018.

**Eligibility**
All abstracts submitted for presentation at the 10th TEPHINET Global Scientific Conference and that describe public health interventions are eligible to be considered for this award. The TEPHINET Advisory Scientific Committee reserves the right to withhold this award based on minimal standards of sound scientific method in the evaluation of an intervention.
After serving as the TEPHINET Advisory Board chairman and board member from 2002 to 2007, Dr. Dionisio José Herrera Guibert served as the director of TEPHINET from March 2009 to December 2018, overseeing a global network of 71 field epidemiology training programs with a presence in more than 100 countries working to improve the capacity of countries to detect and respond to disease outbreaks.

Prior to joining TEPHINET, Dr. Herrera was the director of the Spain Field Epidemiology Training Program, a member of the Alert Unit for Rapid Response at the Institute of Health Carlos III Ministry of Health and Consumer Affairs in Madrid, Spain; a professor at Complutense University of Madrid; and a member of the steering committee for the European Program in Intervention Epidemiology Training. During his public health career, he served as a member of various international committees on field epidemiology and public health and as a consultant to organizations including the World Health Organization and the Centers for Disease Control and Prevention. He worked principally on the development of field investigations, evaluation of epidemiological systems, and training in field epidemiology.

As a graduate of the University of Medical Sciences of Havana, where he received his MD, and the Autonomous University of Madrid, where he received his PhD *apto cum laude*, Dr. Herrera held many other positions including consultant to the Minister of Health in Cuba and medical doctor. He worked as a medical practitioner in Guinea-Bissau, Mexico, and Zambia.
Note to presenters:

To ensure fairness in the evaluation process, please note that should another person present on your behalf, this presenter must be a co-author AND someone from your tier (e.g., a co-author who is a graduate with 5+ years of experience cannot present on behalf of a first author who is a Frontline trainee). If otherwise, your presentation will be disqualified from being judged. We kindly ask that you inform us of this type of change as soon as possible and at the latest, two weeks before the conference. It is also your responsibility to share all correspondence sent to you (e.g., presentation guidelines and logistical information) with the person who will present on your behalf.

I. Oral Presentation Awards

Oral presentation awards include:

- Best Oral Presentation by an FETP Intermediate or Advanced Fellow or Recent Graduate
- Best Oral Presentation by an FETP Frontline Fellow or Recent Graduate*
- Best Oral Presentation by an FETP Alumnus/Alumna*

*“Recent graduate” refers to an FETP graduate who graduated after January 1, 2017. The “Alumnus/Alumna” award will go to a non-recent FETP graduate, one who graduated before January 1, 2017.

Selection Process: Eligibility for oral presentation awards is determined by

1) a pre-conference assessment of the quality of the abstract’s scientific content and
2) the quality of the presenter’s delivery at the conference.

1. Quality of Abstract’s Scientific Content: Assessments are performed during the review process by our pool of qualified reviewers and by the TEPHINET Advisory Scientific Committee (TASC) after the review process is completed. The TASC uses the following information to determine eligibility of abstracts for consideration for Awards: a) the initial ranking of abstracts and selection of submissions for oral and poster presentations; b) scores in public health impact; c) recommendations made by the reviewers based on his/her overall assessment of scientific quality of the work being presented.

2. Quality of Delivery (on site): The TASC will evaluate the quality of delivery of oral presentations using a standard rubric during the conference.

Final decisions will be made at the conference and winners will be announced during the Awards and Closing Ceremony on Friday, November 1, 2019.
II. Poster Presentation Awards

Poster presentation awards include:

- Best Poster Presentation by an FETP Intermediate or Advanced Fellow or Recent Graduate
- Best Poster Presentation by an FETP Frontline Fellow or Recent Graduate

**Selection Process:** Eligibility for poster presentation awards is determined by

1) the quality of the abstract’s scientific content,
2) the visual display of the poster, and
3) the quality of the presenter’s delivery at the conference.

1. **Quality of Abstract’s Scientific Content:** Assessments are performed during the review process by our pool of qualified reviewers and by the TEPHINET Advisory Scientific Committee (TASC) after the review process is completed. The TASC uses the following information to determine eligibility of abstracts for consideration for Awards:
   a) the initial ranking of abstracts and selection of submissions for oral and poster presentations;
   b) scores in public health impact;
   c) recommendations made by the reviewers based on his/her overall assessment of scientific quality of the work being presented.

2. **Visual Display:** Ability to effectively design a poster and convey scientific information that draws interest from viewers and stimulates discussion with the presenter.

3. **Quality of Delivery (on site):** The TASC will evaluate the quality of delivery of poster presentations using a standard rubric during the conference.

Final decisions will be made at the conference and winners will be announced during the Awards and Closing Ceremony on Friday, November 1, 2019.

III. Dionisio Herrera Guibert Award for Best Applied Public Health Intervention

Eligible for consideration for this award are all oral and poster presentations which exemplify an outstanding public health intervention in which field epidemiology leads to improvements in the country’s surveillance system.

**Selection process:** Eligibility for this award is determined by

1) the quality of the abstract’s scientific content and
2) the quality of the presenter’s delivery at the conference.
1. Quality of Abstract’s Scientific Content: Assessments are performed during the review process by our pool of qualified reviewers and by the TEPHINET Advisory Scientific Committee (TASC) after the review process is completed. The TASC uses the following information to determine eligibility of abstracts for consideration for Awards:
   a) the initial ranking of abstracts and selection of submissions for oral and poster presentations;
   b) scores in public health impact; and
   c) recommendations made by the reviewers based on his/her overall assessment of scientific quality of the work being presented.

2. Quality of Delivery (on site): The TASC will evaluate the quality of delivery of eligible presentations using a standard rubric during the conference.

Final decisions will be made at the conference and winners will be announced during the Awards and Closing Ceremony on Friday, November 1, 2019.

Award Selection Procedures: Photo Contest Awards

Photo contest awards include:

**First Place Winner:** Selected pre-conference by a panel of judges through a scoring rubric based on technical and artistic criteria (criteria are outlined in the Call for Photos)

**Second Place Winner:** Selected pre-conference by a panel of judges through a scoring rubric based on technical and artistic criteria (criteria are outlined in the Call for Photos)

**Conference Winner:** Selected by conference attendees via the conference mobile app

**Facebook Winner:** Selected by a public vote held on TEPHINET’s Facebook page

Final decisions will be made at the conference and winners will be announced during the Awards and Closing Ceremony on Friday, November 1, 2019.
TEPHINET Travel Grant for Environmental Epidemiology for Planetary Health

Awarded in memory of James Mendlein

For the first time, TEPHINET was honored to offer this travel grant to two authors for studies on environmental epidemiology and planetary health in order to help cover travel costs to Atlanta for the 10th TEPHINET Global Scientific Conference. The first place grant was awarded to the presenting author of the highest-scoring abstract that met the eligibility criteria (as outlined below, under “Eligibility Criteria”), as determined by our abstract reviewers and the TEPHINET Advisory Scientific Committee. The second place grant was awarded to the presenting author of the second highest-scoring abstract that met the criteria.

Congratulations to the recipients!

First place recipient:
Simon Packer, current fellow of the United Kingdom Field Epidemiology Training Program (FETP), for his abstract (accepted for oral presentation) titled, “Determining the utility of national real-time ambulance syndromic surveillance to identify and monitor the adverse health impact of extreme weather events and seasonal respiratory infections in England” (co-authors: Paul Loveridge, Ana Soriano, Roger Morbey, Dan Todkill, Ross Thompson, Tracy Rayment-Bishop, Richard Pebody, Cathryn James, Hilary Pillin, Alex Elliot, Gillian Smith)

Biography:
Simon Packer is passionate about the use of epidemiological data to direct public health action. He currently works for Public Health England as a Senior Epidemiological Scientist for Field Services South West. Simon is interested in the application of data science techniques to investigate public health problems, bacterial infections in vulnerable community groups, and the application of novel methods to respond to public health issues. Simon recently graduated from the United Kingdom Field Epidemiology Training Program (UK-FETP) in 2019, having previously worked at Public Health England, Health Protection Scotland and the International Union against Tuberculosis and Lung Disease. During his FETP training, Simon implemented one of the first national ambulance syndromic surveillance systems (NASS), investigated outbreaks of Cryptosporidium, Clostridium perfringens and monkeypox, conducted a training needs assessment for Africa CDC’s emergency response team, and undertook a research project looking at the feasibility of using routinely collected data for sepsis surveillance in England. Outside of work, Simon enjoys spending time with friends and family, cooking, playing football, and outdoor activities such as hiking, climbing and wild swimming. Follow him on Twitter @simonpacker33 or email simon.packer@phe.gov.uk.
Second place recipient:
Tamuno-Wari Numbere, recent graduate of the Nigeria Field Epidemiology and Laboratory Training Program (FELTP), for his abstract (accepted for oral presentation) titled, “A comparative study on the influence of industrial air pollution on the prevalence and risk factors for asthma among children in Rivers State - Nigeria, May 2019” (co-authors: Olufunmilayo Fawole, O Morakinyo, Mabel Aworh, Adedoyin A Fetuga, Ibitein Okeafor, Muhammad Shakir Balogun)

Biography:

Tamuno-Wari Numbere is a medical doctor and epidemiologist serving as the Surveillance, Outbreak Response Management and Analysis System (SORMAS) implementation officer in Rivers State, Nigeria. Previously, he worked as a Disease Surveillance and Notification Officer in the Epidemiology department of the Ministry of Health, Rivers State, supervising environmental surveillance for polio, conducting active surveillance for epidemic prone diseases, and contact tracing during the Ebola outbreak in Port Harcourt in 2014. He also coordinated the activities of the Epidemiology and Surveillance pillar of the Emergency Operations Centre for cholera and Lassa fever in Rivers State from 2015 to 2016.

Dr. Numbere recently graduated from the Nigeria Field Epidemiology and Laboratory Training Program (NFELTP) where he gained valuable experience in evaluating surveillance systems, analyzing secondary data and responding to outbreaks of monkeypox and cholera across Nigeria.

He also holds a Postgraduate Diploma and Master of Science degree in Public Health in Developing Countries from the London School of Hygiene and Tropical Medicine where he received the Langley Memorial Prize for his policy report on the 2004 Nigeria Water and Sanitation Policy.

Eligibility Criteria

In order to be eligible for this grant, authors must have submitted abstracts to the conference that met the following criteria. The abstracts must have been accepted for oral presentation.

The abstract must describe a study by fellows or recent graduates (who graduated no earlier than January 2017) from Field Epidemiology Training Programs which is:

- Based on interdisciplinary collaborations (i.e., epidemiology, environmental science, microbiology, social science, anthropology, entomology, ethics, veterinary medicine or other relevant fields) in the field of environmental health/epidemiology, and
- Based on the analysis of social and environmental determinants of communicable diseases and non-communicable diseases, the human health impact assessment of environmental risks (i.e., air pollution), or preparedness measures against climate-related health effects or natural disasters.

It must demonstrate public health relevance and clear recommendations for interventions.
About James Mendlein, MPH, PhD, (CAPT, USPHS)

James Mendlein joined CDC’s Epidemic Intelligence Service (EIS) in 1985, where he served in the Division of Injury Epidemiology and Control. He would later work in the Office of Surveillance and Analysis, and in the Division of Nutrition and Physical Activity (1994-1999), where he helped state departments of health develop nutrition surveillance, epidemiology and prevention activities.

Since 1999, he served in the Division of International Health and the Field Epidemiology Training Program (FETP). Jim was instrumental in the development of the China FETP, teaching and mentoring Chinese residents' investigations, presentations and publications. He also supported Egypt, Jordan, and Brazil with curriculum development, teaching and mentoring, extending his influence to epidemiologists in many countries.

Following retirement after 22 years in the US Public Health Service, he completed several consultations with TEPHINET in support of FETPs, contributing to the accreditation project, which promotes evaluation and continuous quality improvement of FETPs around the world.

Jim’s values and ethics, combined with his scientific work in environmental risks and chronic disease epidemiology, made him aware of the urgency of protecting our environment. Concerned about the health of current and future generations, he was an advocate for sustainability, and had a vision about multidisciplinary approaches in the study of environmental and social determinants, and impact assessment in global public health.
Scientific Abstracts

The following section contains the abstracts being presented at the 10th TEPHINET Global Scientific Conference. Please note that last-minute changes may arise due to unforeseen circumstances. These abstracts are listed in chronological order according to the presentation schedule.

Note: The abstracts’ Table of Contents is interactive. Click on an abstract to jump to its page within this book.

Color Key for Poster Presentation Room

<table>
<thead>
<tr>
<th>Poster Category</th>
<th>Poster Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections Transmitted through Food and Water</td>
<td>Light red</td>
</tr>
<tr>
<td>Vector-borne Diseases</td>
<td>Green</td>
</tr>
<tr>
<td>Public Health Surveillance</td>
<td>Yellow</td>
</tr>
<tr>
<td>Maternal and Child Health</td>
<td>Neon Blue</td>
</tr>
<tr>
<td>Animal Health</td>
<td>Purple</td>
</tr>
<tr>
<td>Anti-Microbial Resistance and Healthcare Related Infections</td>
<td>Pink</td>
</tr>
<tr>
<td>Occupational and Environmental Health</td>
<td>Grey</td>
</tr>
<tr>
<td>Chronic Disease and Injury</td>
<td>Orange</td>
</tr>
<tr>
<td>Vaccine-Preventable Diseases</td>
<td>Light blue</td>
</tr>
<tr>
<td>Viral Hepatitis and HIV</td>
<td>White</td>
</tr>
</tbody>
</table>
Schedule of Oral and Poster Presentations

Session A: Infections Transmitted through Food and Water; Moderators: Martyn Kirk, Eric Mintz; Tuesday, 29 October 2019, 10.30 am, Venue: Dogwood

Outbreak investigation of Salmonella: Alshenan province, Hail, Saudi Arabia, 2018. A case-control study
Dr. ahmed sabur, Prof. Eman Abd-Ellatif

Level and determinant of botulism awareness as a measure of disease protection from home canned and preserved foods—Karasukski District, Osh Province, Kyrgyzstan, 2019
Dr. Nazgul Abamuslimova

Foodborne Outbreak After a Village Festival — Kulon Progo District, Indonesia, 2019
Ms. Iffa Karina Permatasari, Mrs. Nurjanna Nurjanna, Mr. Sugiarito Sugiarito, Dr. Titik Hidayati, Mrs. Tutik Inayah Susilaningsih

Typhoid Outbreak Investigation Conducted in Lundazi District, Zambia, 2019
Mrs. Nelia Mulambya, Mr. Hurst Mwewa, Mr. Jordan Banda, Mr. Francis Nanzalu, Mr. Bernard Khoza, Dr. Jairos Mulambya, Dr. Davy Zulu, Dr. Kennedy Kabuswe

Shigellosis Outbreak Investigation - Mizan Tepi University, Southern Ethiopia, February, 2019
Dr. Henok Solomon, Dr. David Sugerman, Dr. Samrawit Solomon, Mr. Mohammed Nasir, Mr. degefu beyene, Ms. Jimmawork Wondimu

Geographic Mapping of Cholera Hotspots in Tanzania, 2010-2018”: A Tool for Identifying Priority Areas for Intervention
Ms. Jane Mcharo, Dr. Rogath Kishimba, Ms. Loveness Urio, Ms. Senga Sembuche, Dr. Ali Nyanga, Dr. George Kauki, Dr. Ahmed Abade, Dr. Janneth Mghamba

Session B: Vector-borne Diseases; Moderators: Tim Doyle, Linda Quick; Tuesday, 29 October 2019, 10:30am, Venue: Cherry

Mr. Abadi Abebe, Ms. Jimmawork Wondimu, Dr. Dejen Kassa (Lecturer and researcher, Hawassa University)

Dengue Fever Outbreak - Al Qahirah and Al Mudhaffar Districts, Taiz Governorate, Yemen, November 2018
Dr. Abdulkareem Nassar, Dr. Amr Torbosh, Mr. Yassin Abdulmalik, Dr. Mohammed Al Amad, Prof. Abdul Wahed Al Serouri

Sorcery, village conflict and an outbreak of febrile illness; an investigation on Siassi Island - Morobe Province, Papua New Guinea, June 2017
Dr. Mary Kaevakore, Mr. James Flint, Dr. Mathias Bauri, Mr. Berry Ropa
Perception and Adherence to use of Malaria Rapid Diagnostic Test among Health Care Workers – Nigeria, March 2018
Dr. Mamman Aliyu Na’uzo, Prof. Dahiru Tukur, Dr. Muawiyyah Sufyan, Dr. Olufemi Ajumobi, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Mayaro Fever outbreak in the Chirumbia Valley, Province of La Convención, Cusco-Peru Region, 2018: Could it be considered an occupational disease?
Dr. Alex Jaramillo Corrales, Mr. Henrry Hugo Yañez Trujillano, Ms. Matilde Quispe, Ms. Encarnación Valenzuela, Mr. Pablo Grajeda

Session C: Public Health Surveillance; Moderators: Arun Balajee, Germain Bukassa; Tuesday, 29 October 2019, 10:30am; Venue: Poplar

Evaluation of overdose surveillance at overdose prevention sites in Vancouver, Canada, 2019.
Ms. Jessica Prairie, Mr. Tim Chu, Ms. Cher Ghafari, Dr. Mark Lysyshyn, Ms. Helenka Jedrzejowski, Mrs. Elizabeth Holliday, Ms. Sara Forsting

Quality of Malaria Case Management under Different Transmission Settings - Tanzania Mainland, 2019.
Dr. Ally Hussein, Dr. Rogath Kishimba, Mr. Frank Chacky, Prof. Donath Tarimo

Ebola Virus Disease Surveillance System Evaluation, Boke region, Guinea, 2019
Dr. Fatoumata Doumbouya, Dr. Jolie Kasongo Kayembe, Dr. Salomon Corvil, Dr. Claude Ngona Mandro, Dr. Sakoba Keita

Post-flood Disease Surveillance System in Private Healthcare Facilities, Kerala, India, August 2018
Dr. Asish Kumar Satapathy, Dr. Rajeev Sadanandan, Dr. K N Arun kumar, Dr. Asha Raghavan, Dr. Rajesh Yadav, Dr. R L Sarita, Dr. Reena K J, Dr. Danish Ahmed, Dr. Pankaj Bhatnagar, Dr. Pauline Harvey

Spatiotemporal patterns in pertussis incidence — United States, 2000–2017
Dr. Heather Reese, Dr. Nong Shang, Dr. Susan Hariri, Ms. Tami Skoff

Evaluation of Acute Flaccid Paralysis Surveillance System in Children < 15 years - Kenya, 2016–2018
Ms. Gladys Mutethya, Dr. Elvis Oyugi, Mr. Joseph Ogutu, Mr. Moses Melita, Mr. Hillary Limo, Dr. Linda Makayoto, Dr. Zeinab Gura

Session D: Award-Eligible Presentations; Moderators: Conky Quizon, Mufuta Tshimanga; Tuesday, 29 October 2019, 10:30am; Venue: Willow

Mr. Joseph Ogutu, Dr. Maurice Owiny, Mr. Daud Mbatha, Ms. Qabale Duba, Dr. Elvis Oyugi, Dr. Linda Makayoto

A Large Staph aureus Food Poisoning Outbreak among Hotel Guests, Sharkia Governorate, Egypt- July 2018
Dr. Hesham Magdy, Dr. Mohamed Elghazaly, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Foodborne Disease Outbreak among students of Oshakati Senior Secondary School, Oshana region, Namibia - January, 2019
Ms. Roswitha Ndjengwa, Prof. Kofi Nyarko, Ms. Esther Mukete-Hilundutah, Ms. Padelia Ngenokesho
An Outbreak of staphylococcal enterotoxin A Linked to Funeral Banquet in Chengdu, China, 2018
Mrs. Huang Binbin, Mrs. Wenyan Liu, Mr. Ke Jiang, Mrs. Xiaoli Tuo, Mr. Liang Wang

A novel, evidence-based methodology for polio risk assessment – Australia, 2018–2019
Dr. Hendrik Camphor, Dr. Ben Polkinghorne, Ms. Christina Bareja, Ms. Anna Glynn-Robinson

Risk Factors for Heat-Related Illness Among Workers — California, 2000–2017
Dr. Amy Heinzerling, Dr. Rebecca Laws, Dr. Matt Frederick, Dr. Rebecca Jackson, Dr. Gayle Windham, Dr. Barbara Materna, Dr. Robert Harrison

FETP Alumni Oral Presentation Session (sponsored by TEPHIConnect); Moderators: Henry ”Kip” Baggett, Carl Reddy; Tuesday, 29 October 2019, 3:30pm; Venue: Willow

Epidemiology, Risk Factors and Clinical presentation of Neonatal Tetanus (NNT) cases admitted at Sifat Ghayur Shaheed Memorial Infectious Diseases Children (SGSMIDC) Hospital, Peshawar, Khyber Pakhtunkhwa (KP) Province, Pakistan January - April 2019
Dr. Syed Wasif Javed, Dr. Natasha Sumbal

Investigating the health effects of loose-fill asbestos insulation in the Australian Capital Territory, Australia.
Prof. Martyn Kirk, Prof. Rosemary Korda, Prof. Bruce Armstrong, Prof. Cathy Banwell, Mrs. Susan Trevenar, Ms. Hsei-Di Law, Prof. Mark Clements

Health versus Other sectors: Resource Allocation Preferences in Uganda
Mr. Aloysius Mutebi, Prof. Sachiko Ozawa, Dr. Elizabeth Ekirapa, Mr. Yemeke Tatenda, Mr. Anthony Ssebagereka, Ms. Rebecca Apolot

Emergence of Crimean-Congo Haemorrhagic Fever in Uganda: Evidence from a country-wide Seroepidemiological study in Cattle.
Dr. Luke Nyakarahuka, Mr. Stephen Balinandi, Mr. Jackson Kyondo, Ms. Sophia Mulei, Mr. Alex Tumusiime, Dr. John Klena, Dr. Julius Lutwama, Mr. Trevor Shoemaker

Prevalence and Risk Factors for Multi-Drug Resistant Escherichia coli among Poultry Workers – Abuja, Nigeria, 2019
Dr. Mabel Aworh, Prof. Jacob Kwaga, Mrs. Nwando Mba, Prof. Emmanuel Okolocha, Siddhartha Thakur

Unprecedented Upsurge of Lassa fever cases in Nigeria, January to March 2018: a glimpse of hope
Ms. Chioma Dan-Nwafor, Mrs. Elsie Ilori, Dr. Christina Frank, Mr. Oladipupo Ipadeola, Dr. Winifred Ukponu, Mr. Womi Eteng, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku, Dr. Chikwe Ihekweazu

Poster Session; Tuesday, 29 October 2019, 3:30pm; Venue: Stone Mountain Ballroom

Cholera Outbreak in Sinapangan Village, Libungan, North Cotabato, Philippines, July 17-20, 2018
Dr. Eugenia Mercedes Cañal, Dr. Ma. Ivy Rozeth Saavedra-Iturralde, Dr. Alethea De Guzman, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Surveillance data Analysis of Suspected cases of Shigellosis- Burkina Faso, 2010 - 2018
Dr. Sonia Ilboudo, Dr. Yameogo Issaka, Dr. Bicaba Brice Wilfrid, Dr. Sawadogo Bernard, Dr. Yanogo K. Pauline, Mrs. Fadima Diallo R.M., Dr. Joseph Otshudiandjeka, Prof. Meda Nicolas, Dr. Marianne Laurent
Establishment of Enhanced Diarrhea Surveillance in Hospitals After an Armed Conflict in Marawi City, Philippines, June 2017
Ms. Mariz Zheila Blanco, Mr. Jasper Kent Ola, Mr. Alireza Faiyaz, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemía Sucaldito, Dr. Ferchito Avelino

A norovirus gastroenteritis outbreak in high school caused by contaminated barrelled water in Guangdong, China
Ms. Yingyu Lin, Ms. Shuping Gao, Mr. Hai Wang, Ms. Yifang Long, Ms. Siyuan Pan, Mr. Meng Zhang

Outbreak Investigation of Food Poisoning Attributed to Omphalotus japonicus in a restaurant in Jianhe County, Guizhou, China, 2018
Ms. Jing Chen, Mr. Tao Shen, Mr. Yanping Zhang

Food Poisoning in Office X, Sleman District, DIY Province, Indonesia - 2018
Ms. Wafiyyah Rizki Wiariyanti, Ms. Rilla Venia Lalu, Mr. Trisno Agung Wibowo, Mrs. Elisabet Cucuk Prasetyaningsih

Food Borne Outbreak among Sanitary Supervisors during World’s Largest Religious Mass Gathering, Prayagraj, Uttar Pradesh, India-2019
Dr. Abhishek Mishra, Dr. Vaisakh T P, Dr. Binoy Babu, Dr. Tanzin Dikid, Dr. Amol Patil, Dr. S K Jain, Dr. Kiran Kumar Maramraj, Dr. Sushma Choudhary, Dr. Yash Agarwal, Dr. Sujeet Singh

An Outbreak of Norovirus at a Middle School - Guangdong Province, China, 2018
Ms. Jia Peng, Mr. Jianguo Feng, Ms. Huizhen Zheng, Mr. Meng Zhang, Ms. Junling Sun, Dr. Huihui Liu

Norovirus Gastroenteritis Outbreak Secondary to Pollution of Water Supply at a University: Jiangsu, China, 2019
Mr. Yang Han, Ms. Zhaorui Chang, Dr. Huihui Liu, Dr. Rongqiang Zu

Factors associated with practices towards diarrhoea prevention among caretakers of children under five years in Lwengo District, Uganda
Dr. Herbert Bakiika, Ms. Doreen Tuhebwe, Dr. John Bosco Ddamulira

Foodborne Outbreaks During Trauma Healing Program for Earthquake Victims in Mapin Rea Village, West Sumbawa Regency, Indonesia 2018
Mr. Debri Rizki Faisal, Dr. Syahrizal Syarif, Mr. Rusli Rusli

Dr. Kevin Lomuria, Mr. Ben Ngare, Ms. Muma Shariff, Dr. Esther Kinyeru, Mr. Evans Shiraku, Dr. Mark Obonyo, Dr. Zeinab Gura

Prognostic factors of short-term neurologic recovery among children with acute flaccid myelitis–Taiwan, 2015–2018
Dr. Pei-Yuan Wu, Dr. Lee Chin Wong, Dr. Jyh-Yuan Yang, Dr. Chia-Ping Su

Factors associated with the use of long acting reversible contraceptive methods among women of reproductive age- Jinja district, Uganda
Ms. Helen Nelly Naiga, Prof. Christopher Orach
Stillbirths in Jordan: rate, causes, and preventability
Dr. Rakan Aburoman, Dr. Ahmad Abu-Slaih, Dr. Majed Asaad, Dr. Fatima Zerriouh, Prof. Yousef Khader

Risk factors associated with cesarean delivery in pregnant women: Kwanza North Hospital, Angola, 2017
Dr. Moises Kussevi, Dr. Belchior Silva, Dr. João Pires

Risk Factors Associated with Stillbirths in Kibogora District Hospital, Rwanda, 2015
Ms. Esperance Niragire, Dr. Laurence Rugema, Mr. Ladislas Nshimiyamana, Dr. Jared OMOLO, Prof. Joseph Ntaganira

Factors associated with death in patients with respiratory syncytial virus infection during a Severe Acute Respiratory Infection outbreak, January-March 2019 - Manaus, Amazonas, Brazil.
Mrs. Olivia Paula, Mrs. Maria Lopes, Mrs. Rosemary Pinto, Mr. Aleksandro Xavier, Mrs. Marinelia Ferreira, Mrs. Eliana Santos, Mr. Francisco Paula Júnior, Mrs. Walquiria Almeida, Mrs. Rejane Lima, Mrs. Daiana Silva, Mrs. Miriam Livorati, Ms. Marcelo Yoshito Wada, Mrs. Fernanda Bruzadelli

Postpartum Depression among Mothers Attending Primary Health Care Centers in Baghdad, Iraq, 2018
Dr. Zaid Wajih, Prof. Faris Lami, Dr. Riyadh Alredainy

Loss to Follow Up and Associated Factors among Women Enrolled in PMTCT Program in Mbeya Region, Tanzania, 2017
Mr. EMMANUEL MWAKAPASA, Dr. Ahmed Abade, Prof. Elia mmbaga

Maternal Death Surveillance in Deïdo Health District - Littoral Region, Cameroon, 2017
Dr. Marcel Wilfried Nwaha Nwaha, Dr. Gaël KOUAMEN TCHOUNKEU, Dr. Linda ESSO ENDALLE, Dr. Georges Alain ETOUNDI MBALLA

Surveillance Evaluation of Severe Maternal Morbidity - La Altagracia, Dominican Republic, 2017-2018
Dr. Mercedes Cueto, Dr. Samuel Cueto

Postpartum Depression and Associated Factors among HIV Infected Mothers at Mulago Referral Hospital – Uganda, 2018
Ms. Magdalene Akos Odikro, Ms. Naomi Kyeremaa Yeboa, Dr. Patience Muwangunzi, Mr. Tom Denis Ngabirano

Soil-Transmitted Helminths and Associated Factors among Children Less than 15 years in Internally Displaced Persons Camps in Maiduguri Metropolis, Borno State – Northeastern Nigeria, 2018
Dr. Batula Bishara Daggash, Mrs. Lilian Okeke, Dr. Olanrewaju Jimoh, Prof. Adebola Olayinka, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Dr. Aboudramane Lamonkale, Dr. Germain Bukassa, Dr. André Misombo Kalabela, Prof. Mohammed Adnane Tazi, Prof. ABDELMOOUNIM BELALIA, Dr. BOUCHRA ASSARAG

Pediatric Blood Lead Level Testing Rates Among Populations with Risk Factors for Lead Exposure — Indiana, 2017
Dr. Kathryn L Gaub, Mr. Paul Krievins, Ms. Amy Hancock, Dr. Jennifer Brown
Largest Methanol Poisoning Outbreak in Malaysia, September 2018
Dr. Zulraini Jusof, Dr. Rusdi Abdul Rahman, Dr. Siti Halimah Syed Shaikh, Dr. Harishah Talib, Dr. Hasrina Hassan, Dr. Rohani Ismail, Dr. Marina Kamarudin, Dr. Noorhaidah Ujang, Dr. Suhaida Sulaiman, Dr. Mohd Hanif Zailani, Dr. Amirullah Mohd Arshad

Assessment of the biorisk management of a Public Health Reference Laboratory, Northern Region, Ghana-2018
Mr. Daron Davies Atsu-Agbo Agboyie, Ms. Irene Amedro, Dr. Donne Ameme, Ms. Delia Bandoh, Dr. David Opare, Dr. Gifty Boateng, Dr. Samuel Sackey, Mr. Jacob Arthur Quarm, Dr. Ernest Kenu, Prof. Edwin Afari

Community Assessment for Public Health Emergency Response and Health Education following Cyclone Idai in Manicaland Province, Zimbabwe, 2019
Mr. Simbarashe Chiwanda, Ms. Tsetsi Juru, Dr. Emmanuel Govha, Ms. Tendai Chipendo, Dr. Alex Ingwani, Mr. Raphias Shabeyanga, Mr. Chamunorwa Mhembe, Dr. Blessing Mushangwe, Ms. Vaida Kamazizwa, Mr. Paul Musarurwa, Dr. Ronald Nyabereka, Dr. Gerald Shambira, Dr. Notion Gombe, Prof. Mufuta Tshimanga

Measles Outbreak in a Highly Urbanized City, Davao City, Philippines, 2018
Ms. Farah May Clamor, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Diphtheria Epidemic- Yemen, June 2017-August 2018
Dr. Basher Aboasba, Dr. Suaad Moghalles, Dr. Mohammed Al Amad

Increase of invasive meningococcal disease by serogroup W in Santa Catarina, state of South of Brazil, 2017 to 2018.
Mrs. camilla ribeiro, Mr. Isaque Silva, Mr. Igor Ribeiro, Ms. Camila Portela, Mrs. Rejane Alves, Mrs. Maria Agostini, Mrs. Lia Coimbra, Mrs. Gisele Barreto, Mr. Fabio Faria, Mrs. Alda Silva, Ms. Camile Moraes, Mr. Jadher Percio, Mrs. Juliane Malta

Measles outbreak in a marginalized population of Jogapatti block of West Champaran district, Bihar, India, October 2018-March 2019
Dr. Vishesh Kumar, Dr. Sushma Choudhary, Dr. Ankur Nair, Dr. Sanjay Kumar Singh, Dr. Nihar Ranjan Ray, Dr. Pauline Harvey

Early exposure to influenza A(H3N2) viruses and vaccine effectiveness against A(H3N2)-associated illness in U.S. children <18 years, 2016–18
Dr. Chandresh Ladva, Dr. Jessie Chung, Dr. Edward Belongia, Dr. Huong McLean, Dr. Arnold Monto, Dr. Emily Martin, Dr. Manjusha Gagliani, Dr. Michael Reis, Dr. Michael Jackson, Dr. Lisa Jackson, Dr. Richard Zimmerman, Dr. Mary Patricia Nowalk, Dr. Manish Patel, Dr. Alicia Fry, Dr. Brendan Flannery

Dr. AMAL HAMDI, Dr. MOHAMMED KAHHOULI, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUNIM BELALIA, Prof. Asmae Khattabi

Measles outbreak in Jeddah city, KSA 2017-2018: Matched Case-Control Study
Dr. Abdullah Hussain, Prof. Shady Kamel
Inter-county travel leading to measles outbreak in German Camp, Gibi District, Margibi County, Liberia, September 2018

Dr. Maame Amo-Addae, Dr. Peter Adewuyi

Immunization Coverage and Factors Associated with the Non-Vaccination of children aged 12 to 23 months - Goulfey Health district, Far North region Cameroon 2018

Dr. Céline Mairousgou Tchida, Mr. Athanase ATEBA ABINA, Mr. Ndode Corlins, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA, Prof. Dickson SHEY NSAGHA

Determinants and compliance of Health Care Workers update of Influenza vaccines in Fengtai District community health Center, Beijing, 2018-2019

Mr. tian liu, Mr. Zhongfa Tao, Ms. Rui Yang, Mr. Guoqin Zhang, Ms. Yinan Zhang, Ms. Jing Zhao, Ms. Ya Yu, Mr. Zhi Li, Dr. Lijie Zhang, Dr. Jian Cai, Ms. Huilai Ma

Assessment of immunization coverage in major cities of Georgia, 2015—2016

Dr. Tamta Komakhidze, Dr. Nino Khetsuriani, Dr. Mariam "Marika" Geleisvili

Situational Analysis Of Men Who Have Sex With Men And The STI Client Friendly Clinic Service in Johor 2014-2018

Dr. Jeyanthini Sathasivam, Dr. Thilaka Chinnayah, Dr. Harishah Talib, Dr. Shaharom NorAzian Che Mat Din

Social, facility, and individual risk factors for poor retention in HIV care at adult HIV care and treatment clinics in Tanga and Kilimanjaro regions-Tanzania, 2017

Mr. Boniphace Jacob, Ms. Senga Sembuche, Dr. James Gibson, Dr. Ahmed Abade, Dr. Amir Juya, Dr. Janneth Mghamba, Dr. Pamela Kohler, Dr. Katherine Wilson

Level and determinants of non-compliance to antiretroviral therapy among HIV-infected individuals—Kazakhstan, 2017-2018

Dr. Marina Lvova

Accessibility and use of ART among South African population, 2017

Ms. Tebogo Matjokotja, Mrs. Hetani Mdose, Dr. Sizulu Moyo, Dr. Lazarus Kuonza, Prof. Khangelani Zuma

Quality HIV Counselling services are a major driver for uptake of HIV testing services among tea plantation workers in Tamteco-Toro kahuna tea estate, Uganda: Findings from a discrete choice experiment.

Ms. Martha Akulume, Ms. Susan Babirye, Dr. Simon Peter Kibira

Factors Associated with Willingness to Use Mobile Phone Technology Interventions for Medication Adherence among HIV-Positive Patients Attending a Tertiary Hospital – Nigeria, 2018

Dr. John Olujide Ojo, Dr. Muhammad Shakir Balogun, Prof. Olufunmilayo Fawole, Prof. Magbagbeola D Dairo

Assessment of HIV Exposed Infants on Follow Up at Mentor Mothers Program Sites in Kwale County - Kenya, 2016–2018

Mr. Juma Mwavita, Dr. Elvis Oyugi, Dr. Esther Kisangau, Mr. Juma Ahmad, Dr. Zeinab Gura

Measles Outbreak in Kamukunji Sub-County, Nairobi County - Kenya, 2018

Dr. Maryanne Gachari, Mr. Tura Galgalo, Mr. Robert Rotich, Dr. Ali Noor, Mr. Richard Kihara, Dr. Jack Irungu, Dr. Zimy Wansaula, Dr. Meredith Dixon, Dr. Jane Githuku, Dr. Elvis Oyugi, Dr. Zeinab Gura, Dr. Christie Reed
Influenza A (H1N1)pdm09 outbreak in a Senior High School, Greater Accra Region, Ghana-2018 84
Mr. Oxygen Gershion Wullar, Dr. Donne Ameme, Ms. Delia Bandoh, Dr. Ernest Kenu

Session A: Animal Health; Moderators: David Castellan, Innocent Rwego; Wednesday, 30 October 2019, 10:30am; Venue: Dogwood

Fatal Rift Valley Fever Outbreak Caused by Exposures to Meat from Sick and Dead Livestocks: Uganda, July 2018 86
Ms. Angella Musewa, Ms. Doreen Birungi, Ms. Bernadette Basuta Mirembe, Ms. Esther Kisaakye, Dr. Benon Kwegiga, Mr. Stephen Ndugwa Kabwama, Dr. David Muwanguzi, Dr. Deo Birungi Ndumu, Mr. Stephen Balinandi, Dr. Bao-Ping Zhu, Dr. Alex Riolexus Ario

Investigation of Anthrax Outbreak in Human- Nzoka village, Songwe Region Tanzania, 2019 87
Ms. Sia Temu, Dr. Rogath Kishimba, Dr. Henry Kissinga, Ms. Jubilate Bernard, Ms. Loveness Urio

Investigation and Response to Dog Bites and Suspect Cases Rabies - Batouri Health District, East Cameroon, 2018 88
Dr. Henri Magloire BOFIA BOYOGUENO, Dr. Annie Marielle MENGUE ESSINDI, Dr. Rose-Carole BOHIMBO M., Dr. Serge SADEUH, Dr. Georges Alain ETOUNDI MBALLA

Case-Control Study of Gastrointestinal Anthrax, Cayapa Village, Lagangilang, Abra, Philippines, March 2017 89
Ms. Karen Lonogan, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemfa Suvaldito, Dr. Ferchito Avelino

Session B: Anti-microbial Resistance and Healthcare-related Topics; Moderators: Michael Gronostaj, Matt Mikoleit; Wednesday, 30 October 2019, 10:30am; Venue: Cherry

Occurrence and antimicrobial susceptibility patterns of Escherichia coli isolates from raw meat in Ghana-2019 91
Dr. Esther Dsani, Dr. Donne Ameme, Dr. Ernest Kenu, Dr. Samuel Sackey, Dr. Beverly Egyir, Prof. Edwin Afari

Ms. Marvellous Mhondoro, Mr. Nqobile Ndlovu, Mr. Donewell Bangure, Ms. Tsitsi Juru, Dr. Notion Gombe, Dr. Gerald Shambira, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Outbreak Investigation of Extensive Drug Resistant Typhoid Fever - Hyderabad, Pakistan 2017 93
Dr. Mudassar Hussain, Dr. Santosh Kumar, Dr. Munaza Qadri, Dr. Sandeep Kumar, Dr. Naveed Memon, Dr. Musa Raheem, Dr. Mirza Amir Baig

Factors associated with Multidrug-resistant Tuberculosis in Rwanda: Secondary data analysis of the Rwanda 2015 Drugs Resistance Tuberculosis Survey 94
Dr. Byiringiro Rusingiro, Dr. Patrick Migambi, Dr. Yves Mucyo, Prof. Joseph Ntaganira
Invasive Group A Streptococcus Infections Among Residents of Multiple Nursing Homes—Denver, Colorado, 2017–2018
Dr. Osatohamwen Idubor, Mrs. Nisha Alden, Ms. Helen Johnston, Ms. April Burdorf, Ms. Devra Barter, Dr. Ariella Dale, Ms. Alana Gilwick, Ms. Janell Nichols, Mr. Geoff Brousseau, Dr. Alexis Burakoff, Dr. Wendy Bamberg, Dr. Rachel Herylihy, Dr. Heather Reese, Dr. Sukarma Tanwar, Mr. Wycliffe Onongo, Dr. Abimbola Ogundimu, Dr. Nimalie Stone, Dr. Srinivas Nanduri, Dr. Sopio Chochua, Dr. Chris Van Beneden

Access for Public Health Care of Refugees and Migrants in Rabat, Morocco 2018
Dr. Aasma Chaoui, Ms. FATIMA ZAHRA MESKI, Dr. samir mounah, Dr. Latifa Belakhel, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUNIM BELALIA, Dr. MOHAMMED YOUBI

Session C: Chronic Disease and Injury; Moderators: Ann Dellinger, Bao-Ping Zhu; Wednesday, 30 October 2019, 10:30am; Venue: Poplar

Geospatial distribution of pedestrian injuries and associated factors in the greater Kampala Metropolitan area, Uganda
Mr. Frederick Oporia, Prof. Nazarius Mbona Tumwesigye, Dr. John Bosco Isunju, Ms. Rebecca Nuwamatsiko, Dr. Abdulgafoor Mahmood Bachani, Ms. Angela Kisaky, Ms. Mary Nakafeero, Mr. Fiston Muneza, Dr. George Kiwanuka, Dr. Nino Paichadze, Dr. Olive Kobusingye

Prevalence of Pre-Diabetes among Saudi Male Adults Attending Primary Health Care Centers- Makkah City- Saudi Arabia, 2019
Dr. Jalal Mzja, Prof. Randa Nooh, Dr. Ayman Mzjaji, Dr. Hossam Al-Esawi, Dr. Ahmad Alowfi

Mr. Paul Musarurwa, Ms. Tsitsi Juru, Dr. Hilda Bara, Dr. Prosper Chonzi, Dr. Gerald Shambira, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Magnitude of road traffic injuries and factors associated with mortality, - Ilala Municipal Council, Dar es Salaam, Tanzania, 2016
Dr. Angela Samwel, Dr. James Gibson, Dr. Ahmed Abade, Dr. Rogath Kishimba, Dr. Hamisi Shabani, Dr. Candida Moshiro

Risk Factors for Cardiovascular Diseases among Adolescents in Lagos: Implication for Blood Pressure Profile and Weight Status – Nigeria, December 2017
Dr. Adedoyin A Fetuga, Dr. Muhammad Shakir Balogun, Dr. Olufemi Ajumobi, Dr. Eniola Bamgboye, Dr. Patrick Nguku, Prof. Magbagbeola Dario

Patterns and Determinants of Female Perpetrated Intimate Partner Violence in Abuja – Nigeria 2018
Dr. Ramatu Abdu-Aguye, Prof. Dahiru Tukur, Dr. Mahmood Dalhat, Dr. Saheed Gidado, Dr. Muhammad Shakir Balogun, Dr. Chukwuma Umeokonkwo

Session D: Award-Eligible Presentations; Moderators: Sahar El-Shourbagy, Chima Ohuabunwo; Wednesday, 30 October 2019, 10:30am; Venue: Willow
Dr. Nejib Charaa, Dr. Rabaa Ghrab, Dr. Aicha Othman, Dr. Mohamed Makhlouf, Dr. Hajer Letaief, Prof. Nissaf Ben Alaya

An Outbreak of Fever and Death in a Training Camp for Young Men – Kohat, Pakistan 2018  
Dr. Eisha Mansur, Dr. Naiila Azam, Dr. Tariq Bashir, Dr. Mansoor Tariq, Dr. Tahir Butt

Foodborne outbreak linked to salad consumption in a Senior High School, Sekondi-Takoradi Metropolis, Western Region, Ghana-2019  
Ms. Irene Amedzro, Dr. Abraham Tachie-Menson, Mr. Obed Bangdome Ofori, Ms. Akua Boadiwaa Amoh-Yeboah, Mr. Daniel Agudey, Ms. Vida Kwofe, Dr. Christabel Ayepah, Ms. Safiatu Tarl Abdullai, Mr. Ebenezer Kofi Mensah, Dr. Donne Ameme, Dr. Ernest Kenu

An Outbreak of Hemorrhagic Symptoms –Behira Governorate, Egypt, 2018  
Dr. Hala Saad, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Geographical Variation in Childhood Measles Vaccination and Associated Factors in Ethiopia: A Spatial and Multilevel Analysis  
Mr. Tesfahun Taddege, Dr. Lemma Derseh, Mr. Ayenew Negesse

An ecological assessment of the impact of funded cocoon and maternal pertussis vaccination strategies on pertussis epidemiology in young infants - Australia, 2000–2017  
Ms. Dharshi Thangarajah, Dr. Jonathan Malo, Dr. Emma Field, Dr. Stephen Lambert

FETP Frontline Oral Presentation Session; Moderators: Dianna Carroll, Augusto Lopez; Wednesday, 30 October 2019, 3:30pm; Venue: Willow

Descriptive Study on Suicides in Belize, 2014 – 2018  
Mr. Edgar Nah, Mrs. Lorna Perez, Dr. Russell Manzanero

Investigation of maternal death, Manhyia North Sub Metropolis, Ashanti Region, Ghana - 2019  
Ms. Elsie Kissi-Appiah, Ms. Magdalene Akos Odikro, Ms. Delia Bandoh, Mr. Joseph Asamoah Frimpong, Mr. Lenox Goulbourne, Dr. Donne Ameme, Dr. Ernest Kenu

Prevalence and risk factors of needle stick and sharps injuries among Koidu government hospital workers, Kono district, Sierra Leone, 2019  
Mr. Abu Gbondo, Mr. Eric Ikoona, Ms. Sara Demas, Mr. Gildo Okure, Mr. Gebrekristos Gebru, Mr. Uzoma Ogbonna, Mr. Leonard Hakizimana, Dr. Mohamed Alex Vandi, Dr. Marta Guerra

Scabies Outbreak Investigation in Bilawanja Mosque, Hulbareg District, Southern Ethiopia, 2017  
Mr. Mohammed Yasin

Treatment Outcomes among Drug Sensitive Tuberculosis Patients in Tana River County - Kenya, 2014–2017  
Mr. Nalikwa Bonaya, Dr. Elvis Oyugi, Dr. Esther Kisangau, Dr. Zeinab Gura

Outbreak of Salmonella enteritidis among guest of wedding party - Ajara, Georgia, 2018  
Mrs. Mziuri Jakeli, Dr. Nona Ephadze, Dr. Eka Khabazi, Mrs. Keti Galdavadze
Investigation of Monkeypox cases in Pujehun and Kailahun Districts, Sierra Leone, 2018 – 2019
Mr. Nyuma Jeremiah Sengu, Mr. Musa Deiman Sheriff, Mr. Musa A. Sesay, Mr. Alhaji Conteh, Dr. Anthony Domawa, Mr. Amara Alhaji Sheriff, Dr. AMARA Ngebung, Dr. Peter Lansana, Mr. Uzoma Ogbonna, Mr. Leonard Hakizimana, Mr. Gildo Okure, Mr. Gebrekristos Gebru, Mr. Eric Ikoona, Mr. Eddy Ortega, Ms. Erin Whitehouse, Ms. Andrea McCollum, Dr. Mohamed Alex Vandi, Dr. Marta Guerra

Anthrax Outbreaks among Domestic Ruminants Associated with Butchering Infected Livestock and Improper Carcass Disposal: Three Districts, Uganda, 2016-2018
Dr. Fred Monje, Ms. Esther Kisaakye, Mr. Daniel Eurien, Ms. Vivian Ntono, Dr. Benon Kwesiga, Mr. Daniel Kadobera, Dr. Deo Birungi Ndumu, Dr. Alex Riolexus Ario, Dr. Bao-Ping Zhu

Seroprevalence and risk factors of Human Brucellosis among livestock farmers and their entourage in Sidi Kacem, Morocco 2018: A Cross Sectional Study
Dr. houda moumnni Abdou, Dr. kaoutar faddane, Dr. Mohamed Lakranbi, Dr. IMAD CHERKAOU, Dr. fatna bourjilate, Dr. Hind ZZINE, Dr. Germain Bukassa, Dr. MOHAMMED YOUBI, Prof. naima elmdaghri, Prof. Abderrahmane Maaroufi, Prof. Mohammed akrim, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUNIM BELALIA, Dr. mohamed Elazhari

Epidemiological Profile of Human Brucellosis in Jordan, 2017
Dr. Nansi Abdulrahim

Rapid assessment of coverage of chemoprophylaxis against Leptospirosis in Post flood situation in Kozhikode District, Kerala, India, 2018
Dr. HARISANKAR SASIKUMAR, Dr. Ganeshkumar P, Mr. Kamaraj Pattabi, Mr. Sabrinathan R, Dr. A P Sugunan, Dr. Manoj Murhekar

Dr. KIRANA NORA DECHANON, Dr. Sirintip Khemtong, Dr. Budisabong Kanchanasaka, Dr. Saowaluck Paduang, Dr. Wichuda Wichaidit, Dr. Bongkotcham Phimsin, Dr. Taksina Jaruwattananon, Dr. Nuntita Ruksachat, Dr. Rattana Sariwongchan, Dr. Paisin Lekcharoen, Dr. Karoon Chanachai

Trend of Cutaneous Leishmaniasis in Jordan, 2010-2016
Dr. Mohammad Alhawarat, Dr. Bassam Shadfan, Dr. Ibrahim Iblan, Dr. Ashraf Aqel

An Outbreak of Human Cutaneous Anthrax in a Village of Inner Mongolia Autonomous Region, China, 2018
Mr. Boxi Liu, Ms. Huilai Ma, Ms. Zhen Xu

Epidemiological profile of cases of multiple outbreaks of anthrax in humans and animals in Labé Health Region, Guinea, 2014 - May 2019
Dr. Mamadou Moustapha Bah, Dr. Gbamou Nouonan, Dr. Sakoba Keita, Dr. Salomon Corvil

Human Monkey Pox Epidemic: Epidemiology, Characteristics and Public Health Implications - Cameroon, May-June 2018
Dr. priscilla ANYA, Dr. Patricia MENDJIME, Dr. Messe Prosper, Dr. Franck AMABO CHI, Dr. Charles KWECHE PETCHU, Dr. Kingsley OMBAKU, Dr. Soreya DAWA, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA
Mrs. Concepcion Esmeralda Barrera, Mrs. Nadia Competiello, Mr. Victor Calvo, Mrs. Gabriela Larco, Ms. Marisa Rodriguez, Mrs. Paula Leon, Mrs. Velen Pennini, Mrs. Sofia Armendariz, Mrs. Pilar Barcena Barbeira, Mrs. Camila Dominguez, Mr. Emiliano Biondo, Mr. Jorge Diaz, Mrs. Carolina Betancourt, Mrs. Malen Torres, Mrs. Vanesa Serrat, Mrs. Analia Iturra, Ms. Julieta Levite, Ms. Maria Laura Recoder, Mrs. Teresa Strella, Ms. Patricia Angeleri, Mr. Jorge Elías, Mr. Pablo Noveau

Epidemiological Characteristics of human sporotrichosis - João Pessoa, Brazil, 2019
Ms. Danielle Lucena, Mr. Daniel Batista, Ms. Aleksandra Bezerra Monteiro de Oliveira, Ms. Martha Helena Cezar

Dr. magdalena kasika, Ms. Nsiande Lema, Dr. Ernatus M Mkupasi, Dr. Joseph Genchwere, Dr. Rogath Kishimba, Dr. Janneth Mghamba, Ms. Senga Sembuche

Healthcare Associated Sepsis's factors and outcomes observed during two outbreaks at Saint – Damien Hospital neonatal unit in Haiti, 2018 - 2019
Dr. Vanessa Jaelle Dor, Dr. Jacqueline Gautier, Dr. Omega Chery

Risk factors and genomic investigation of a cluster of Carbenemase producing Klebsiella Pneumoniae at a tertiary hospital ICUs-Egypt, 2016-2017
Dr. Saly Wagdy, Dr. Adel Mansour, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Trends of Drug Resistant Tuberculosis at Oshakati Namibia 2012-2016
Ms. Esther Mukete-Hilundutah, Prof. Kofi Nyarko

Treatment outcomes of multi-drug resistant tuberculosis and associated factors among patients at Iganga and Mbale treatment centres - Uganda: A retrospective cohort study
Ms. Diana Zemei, Dr. Esther Buregyeya, Dr. Stevens Kisaka

Antibiotic prescription practices in primary healthcare settings-Georgia, 2017
Dr. Shorena Svanidze, Dr. Eka Khabazi, Dr. Nona Ephadze, Dr. Nato Nakashidze

Dr. Usman O Adekanye, Dr. A Ekiri, Dr. E Galipo, Dr. B Mohammed, Dr. Muhammad Shakir Balogun

Antimicrobials misuse in Egypt: A cross-sectional national survey for community pharmacy staff, 2018
Dr. Rania Attia, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Do Unmanned Aerial Vehicles reduce the duration and cost of transportation for diagnosis of multi-drug resistant tuberculosis? A Feasibility study – Chamba, Himachal Pradesh, India 2018
Dr. Vishal Thakur, Mr. Lakshmanan Sundaramoorthy, Dr. Parasuraman Ganeshkumar

Beta-lactam Resistance Phenotypes of Enterobacteria strains isolated in Urinary Tract Infections at Sylvanus Olympio Teaching Hospital - Lomé, Togo, 2018
Ms. Amivi Mawussi GODONOU, Dr. André Misombo Kalabela, Dr. Rébecca KINDE, Prof. Mounerou SALOU, Dr. Wemboo Afiwa HALATOKO, Dr. Sika DOSSIM, Prof. Anoumou Yaotsè DAGNRA
Mr. Ceesay Sainey BF, Mr. Mamadou M Jallow, Dr. Annah Jammeh, Dr. Peter Adewuyi, Mr. Sana Sambou, Mr. Ignatius Baldeh, Mr. Bakary Sanneh, Mr. Musa Jallow, Mr. Amadou Jallow, Mrs. Ndey Binta Bah

Risk factors related to suicide attempts as predictors of suicide, Colombia, 2016-2017
Dr. Luz Castro, Ms. Marcela Muñoz, Dr. Oscar Eduardo Pacheco Garcia, Dr. Luis Fuertes

Incidence and Sociodemographic Predictors of Obesity among 6,349 Adults in China, 2010–2016: a Longitudinal Study
Ms. Yunting Xia, Dr. Jianhong Li, Dr. Yali Zhang

Knowledge, Attitude and Practices towards sickle cell screening among Health workers in Tororo District-Uganda, 2018
Ms. Brenda Ayugi, Dr. Francis Xavier Kasujja, Prof. Fredrick Makumbi

Association of Sedentary Time with Metabolic Syndrome Among Adults – China, 2013
Ms. Huimin Yan, Dr. Limin Wang, Dr. Yali Zhang, Ms. Yunting Xia

Childhood Cancer Survival Rate and Characteristics in Morocco; A retrospective Cohort, Hospital based Study
Dr. ilham dahbi, Prof. Laila Hessissn, Prof. Mohammed Khttab, Prof. SAMIR AHID, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUNIM BELALIA, Prof. Mohammed Adnane Tazi

Survival and Its Predictors among Colo-Rectal Cancer Patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2012-2016: Hospital-Based Retrospective Cohort Study
Mr. Mohammed Ahmed, Mr. Aman Yesuf, Dr. Jilcha Dirbi, Dr. Mamo Wubshet

Timing of Diagnosis among patients with Prostate Cancer at the Uganda Cancer Institute
Mr. Nelson Bunani, Dr. Aloysius Ssennyonjo, Mr. Steven Ssendagire, Ms. Angela Kisakye, Prof. Fred Nuwaha

Prevalence of Shisha Smoking, Knowledge of its Health Consequences and Associated Factors among Students of a Tertiary Institution in Ibadan – Nigeria, 2019
Dr. Olukorede Ikwunne, Prof. IkeOluwapo Ajayi, Dr. Oyindamola YUSUF, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Combating the persistent cholera epidemic in the complex nomadic society of Northern Tanzania: The impact of enhanced targeted micro-scale interventions – Ngorongoro District, October 2018
Mr. Ambakisye Mhiche, Ms. Neema Nagu, Mr. Remidius Kakulu, Mr. Pai Elia, Mr. Selemani Yondu, Ms. Senga Sembuche, Dr. Ali Nyanga, Dr. Khalid Massa, Dr. Ahmed Abade, Dr. Rogath Kishimba

Evaluation of surveillance system for measles – Morocco, 2017
Dr. FATIMA ZAHRA BENFOUILA, Ms. FATIMA ZAHRA MESKI, Dr. Ahmed RGUIG, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUNIN BELALIA, Prof. HICHAM NEJMI

Dr. Joanne Taylor, Dr. Ruth Lynfield, Dr. Paula Snippes Vagnone, Dr. Kirk Smith, Dr. Nancy Wengenack, Dr. Sharon Deml, Dr. Glen Hansen, Dr. Patricia Ferrieri
Simplifying the reporting systems and designating peripheral staff for surveillance can improve Case Based Surveillance for Diphtheria at Kozhikode district, Kerala, 2018
Dr. Aarathee Renjith, Dr. Ponnaiah Manickam, Mr. Kangusamy Boopathi

Lesson Learned From Initial Effective Vaccine Management (EVM) Evaluation at Public Health Center in Boyolali District, Central Java Province-2018
Mr. Rido Illahi Ayef Eka Putra, Mr. Teguh Tri Kuncoro, Dr. Dibyo Pramono

Evaluation of an illegal drug toxicity surveillance system - British Columbia, Canada, 2019
Ms. Andrea Schertzer, Ms. Margot Kuo, Dr. Jane Buxton, Mr. Christopher Mill

Factors associated with access to basic households’ water, sanitation and hygiene in Ngorongoro cholera epidemic villages-Arusha, 2019
Mr. Boniphace Jacob, Prof. Method Kazaura, Ms. Senga Sembuche

Analysis of SARI (Severe Acute Respiratory Infections) severity reported from surveillance sentinel sites in Turkey, 2015-2016
Dr. Hamdiye Yilmaz Nemli, Dr. Selmur TOPAL, Dr. Fehminaz Temel, Dr. Gülen PEHLIVANTÜRK, Dr. Emine AVCI

Tuberculosis Mortality in Lusaka, Zambia, 2016; Old Age, Health Facility Type and HIV Co-Infection as Associated Factors
Mr. Francis Nanzalauka, Ms. Slyvia Chibuye, Ms. Clara Kasapo, Mrs. Nelia Mulambya

Uganda Ebola Virus Disease Preparedness Assessment and Risk Mapping, August - September 2018
Dr. Carol Nanziri, Ms. Vivian Ntono, Mr. Godfrey Nserekoi, Dr. Fred Monje, Ms. Dativa Maria Aliddeki, Mr. Kenneth Bainomugisha, Ms. Lilian Bulage, Mr. Daniel Kadobera, Mr. Joshua Kayiwa, Dr. Patrick Tusiime, Dr. Eldard Mabumba, Mr. Michael Kibuule, Ms. Lydia Nakiire, Dr. Felix Ocom, Dr. Alex Riolexus Ario

Analysis of surveillance data of tuberculosis - Senegal from 2009 to 2018
Dr. Kalidou Sow, Dr. Ndiaye Mathias, Dr. Madou Kane, Dr. Sawadogo Bernard, Mrs. Fadima Diallo R.M., Dr. Joseph Otshudiandjeka, Dr. Yanogo K. Pauline, Prof. Meda Nicolas

Added Value of the Community-Event-Based Surveillance Approach In Disease Detection - Japoma Health District, Littoral Region, Cameroon, 2019
Dr. Jeanne Liliane MBENGUE, Dr. Tatiana DJIKEUSSI KATCHO, Dr. Victor KAME, Dr. Hans Dominic MOSSI MAKEMBE, Dr. Franck AMABO CHI, Dr. Yannick KAMGA, Dr. Armel EVOUNA, Dr. Rose-Carole BOHIMBO M., Dr. Serge BILLONG, Dr. J. DISSONGO, Dr. Georges Alain ETOUNDI MBALLA

Investigation of the public health event in the Cafunfu town, Lunda-norte, Angola in December 2017
Dr. Dilunvuide Pode, Dr. Regina António, Dr. Arieth Cruz, Dr. Roygue Alfredo, Dr. Maria Nsuka, Dr. Maria Pambasange, Dr. João Pires

Health Workers’ Perception of Malaria Rapid Diagnostic Test and Factors Influencing Compliance with Test Results in Ebonyi State – Nigeria, 2017
Dr. Izuchukwu F Obi, Prof. Kabir Sabitu, Dr. Abdulhakeem Olorukooba, Dr. Ayo Adebowale, Dr. Rabi Usman, Dr. Ugochukwu Nwokoro, Dr. Olufemi Ajumobi, Prof. Suleiman Idris, Mr. Lawrence Nwankwo, Prof. IkeOluwapo Ajayi, Dr. Muhammad Shakir Balogun
Enhanced surveillance of mosquitoes and vector-borne diseases in the Maltese Islands: Molecular species identification, insecticide resistance monitoring, and risk assessment for vector-borne infections (2018)  
Dr. Raquel Medaldea Carrera, Dr. Tanya Melillo, Mr. Max Fotakis, Dr. John Vontas, Dr. Maria-Louise Borg

Chikungunya Fever Outbreak in a Candy-making Home Industry, Nagcarlan, Laguna, Philippines 2018  
Dr. Jessica Cagadas, Dr. Eugenia Mercedes Cañal, Ms. Precious May Gabalfin, Dr. Alethea De Guzman, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Aggressive environmental control to stop the largest dengue fever outbreak in Hong Kong, 2018  
Dr. Ambrose Wong, Dr. Yonnie Lam, Dr. SK Chuang

Factors Associated with Asymptomatic Malaria Infection among Primary School Pupils in Buhigwe District, Kigoma, Tanzania  
Dr. PILI KIMANGA, Dr. Rogath Kishimba, Dr. Mucho Mizunduko, Mr. Frank Chacky, Dr. Billy Ngasala

Dengue Outbreak among Hospital Staff in a Government Hospital - National Capital Region, Philippines, September 2018  
Dr. Ma. Ivy Rozeth Saavedra-Iturralde, Dr. Eugenia Mercedes Cañal, Dr. Alethea De Guzman, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Factors Associated with Private Health Facilities Reporting Malaria in the National Health Management Information System in Zambia: A Cross Sectional Study  
Ms. Angela Gama

An outbreak of Severe Fever with Thrombocytopenia Syndrome (SFTS) caused by human-to-human transmission in a hospital, Jiangsu, East China, 2018  
Mr. zhong zhang, Ms. Zhaorui Chang, Ms. Jianli Hu, Mr. Tao Ma, Mr. Jianfeng Liu, Dr. Huihui Liu

Session A: Vaccine-preventable Diseases; Moderators: David Sugerman, Sara Lowther; Thursday, 31 October 2019, 10:30am; Venue: Dogwood

Analysis of Measles surveillance data- Bangladesh, 2013-2017  
Dr. Farzana Islam Khan, Dr. Mallick Masum Billah, Dr. Priyakanta Nayak, Dr. Sultan Md. Shamsuzzaman, Dr. Meerjady Sabrina Flora

Rate of and factors associate with parents’ refusal to give birth dose vaccines against Hepatitis B and Tuberculosis, Alamudun district, Kyrgyzstan, Jan–April 2019  
Dr. Bermet Mamytkanova

Measles Outbreak Investigation and Vaccination Coverage Assessment - Rey Bouba Health District, North Cameroon, April 2018: A Case-Control study  
Dr. Gisèle Efouba Mvondo, Dr. MBELLA Maurice Rocher, Dr. Eric MBOKE EKOUM, Mr. Ndode Corlins, Dr. Natacha NSIEWE, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA

Multiple source outbreak of influenza types A and B in a Basic School, Greater Accra Region, Ghana – 2018  
Mr. Raymond Razak Mahama, Mr. Francis Sena Nuvey, Dr. Ekua Essumanma Houphouet, Dr. Priscillia Nortey, Dr. Gloria Akosua Ansa, Dr. Afua Asabea Amoabeng, Dr. Gifty Harriet, Dr. Ernest Kenu, Prof. Edwin Afari
First Confirmed Pertussis Outbreak in Ethiopia - Daramallo District, GamoGofa Zone, Southern Ethiopia, 2018
Dr. Adugnaw Tasie, Mr. Girma Abate, Dr. David Sugerman, Mr. Diriba Gemechu, Mr. Mohammed Nasir, Mr. Hailemichael Bizuneh, Mr. Zewdu Assefa, Dr. Feyesa Regessa, Dr. Beyene Moges

National surveillance data analysis on Adverse Events Following Immunizations for Combined Diphtheria Tetanus and Acellular Pertussis Vaccine: China, 2015 -2017
Mr. Siquan Wang, Ms. Keli Li, Ms. Disha Xu, Dr. Lijie Zhang

Session B: Animal Health; Moderators: Navneet Dhand, Julio Pinto; Thursday, 31 October 2019, 10:30am; Venue: Cherry

Case-control study of zoonotic brucellosis in South of Morocco, 2017
Dr. HIND MAJIDI, Dr. FOUAD LAAKABI, Prof. Mohammed Adnane Tazi, Dr. Ahmed RGUIG, Dr. Hind EZZINE, Dr. Mohamed Lakrambi, Dr. IMAD CHERKAOUI, Dr. MOHAMMED YOUBI, Prof. Asmae Khattabi, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUMIN BELALIA, Prof. HICHAM NEJMI

Cutaneous Anthrax Outbreak Associated with Handling Dead Animals, Rhino Camp Sub-county, Arua District, Uganda, January-May 2018
Ms. Vivian Ntono, Mr. Daniel Eurien, Ms. Lilian Bulage, Mr. Daniel Kadobera, Dr. Alex Riolexus Ario

EFFECTIVE PUBLIC HEALTH ACTION FOLLOWING AN ANTHRAX OUTBREAK AMONG HIPPOPTAMI AND CAPE BUFFALOS IN BWABWATA NATIONAL PARK, NAMIBIA WITH NO HUMAN CASES, OCTOBER-NOVEMBER 2017
Ms. Annetty Likando, Prof. Kofi Nyarko, Ms. Rebekka Shikesho, Ms. Iyaloo Mwaningange

Campylobacter Positivity and Public Health Risks in Live Bird Markets, Busia, Kenya, 2018
Dr. Josephat Mbai, Dr. Mark Obonyo, Dr. Christina Otieno, Dr. Zeinab Gura, Dr. Maurice Owiny, Mr. Samuel Njoroge, Prof. Eric Fevre

Knowledge, attitude and practices on acaricide use in Uganda’s cattle corridor
Ms. Phoebe Nabunya, Ms. Doreen Tuhebwe, Mr. Manaseh Anziku, Ms. Rachel Faith Mirembe, Mr. Bunjo Kiku, Ms. Phiona Epuli Mara, Mr. Peter Onyango, Ms. Caroline Achieng, Mr. Adams Kamukama, Dr. Herbert Bakiika, Ms. Grace Ruto, Ms. Angela Kisakye, Mr. Steven Ssendagire

Session C: Viral Hepatitis and HIV; Moderators: Alex de Voux, Lindsey Hiebert; Thursday, 31 October 2019, 10:30am; Venue: Poplar

Hepatitis A Vaccine Immunogenicity 25 Years After Vaccination in Alaska
Dr. Maya Ramaswamy, Dr. Dana Bruden, Dr. Mary Snowball, Dr. Julie Morris, Dr. Philip Spradling, Dr. Noele Nelson, Dr. Michael Bruce, Dr. Brian McMahon

Evaluation of the HIV Viral Load laboratory based Surveillance System and characterisation of Viral Suppression in a rural County - Kenya, 2015–2018
Dr. festus kigen, Dr. Maurice Owiny, Mr. Moses Melita, Mr. Hosea Serech, Dr. Zeinab Gura
Determinants of First Line Antiretroviral Treatment Failure among Patients on Highly Active Antiretroviral Therapy in Selected Public Hospitals - Jimma, Southwest Ethiopia a Case Control Study
Mr. amrachu bekele, Mr. Tamrat Shaweno, Dr. Lelisa Sena

Incidence of active tuberculosis and risk factors for HIV patients infected with HIV at the start of antiretroviral treatment in Luanda 2016-2017
Dr. Luis Bandeira, Dr. Tazi Nimi, Dr. João Pires

HIV prevalence among women presenting in maternity ward of Katima Mulilo Hospital, Zambezi Region, Namibia (2013-2017)
Ms. Rosalia Nairenge, Prof. Kofi Nyarko

Session D: Award-Eligible Presentations; Moderators: Kashef Ijaz, Patrick O'Carroll; Thursday, 31 October 2019, 10:30am; Venue: Willow

Piloting a hospital-based road traffic injury surveillance system in Nairobi County, Kenya, 2018-2019
Dr. Valerian Mwenda, Dr. Elvis Oyugi, Ms. Merissa Yellman, Dr. Philip Maseghe, Dr. Gladwel Gathecha, Dr. Zeinab Gura

Survival Status and Predictors of Mortality among Patients with Multi-Drug Resistant Tuberculosis Treated in Treatment Initiating Centers Ethiopia, 2018: A Retrospective Cohort Study
Mr. Getahun Kebede

Fatalities Associated with Road Traffic Accidents in Kaduna State – Nigeria, 2012-2018
Dr. KWADA ASUNDUWA, Dr. Mabel Aworh, Dr. Visa I Tyakaray, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Vertical transmission of HIV in the era of universal antiretroviral therapy in Zvimba district, Zimbabwe 2016-2017
Dr. Tapiwa Dhliwayo, Dr. Blessing Mutede, Dr. Agnes Mahomva, Ms. Tsitsi Juru, Dr. Gerald Shambira, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Measles Outbreak at Religious Study Camp: Findings from Response Against Non-Vaccinated Population, Mie prefecture, Japan, 2019
Dr. Asuka Takeda, Dr. Chiaki Kawakami, Dr. Hajime Kamiya, Mr. Yasuyuki Hara, Dr. Hajime Kusuhara, Ms. Miharu Nishio, Mr. Takehiro Ogura, Dr. Yoshito Iwade, Ms. Yasuko Kanaya, Mr. Takahiro Shimoo, Dr. Tamano Matsui, Dr. Tomimasa Sunagawa, Dr. Motoi Suzuki

Measles Outbreak Investigation in Ginnir District of Bale Zone, Oromia Region, Southeast Ethiopia, May 2019
Mr. Falaho Kalil, Mr. Desta Gemeda

Outbreak Investigation of acute viral hepatitis E – Landikotal, Pakistan 2017
Dr. Izza Badar, Dr. Rizwan Ahmed, Dr. Tariq Ismail, Dr. Mirza Amir Baig

Session A: Infections Transmitted through Food and Water; Moderators: Marina Kamaruddin, Martyn Kirk; Friday, 1 November 2019, 10:30am; Venue: Dogwood
An investigation on a food poisoning caused by Vibrio parahaemolyticus in a restaurant, in Sichuan Province, China, 2018
Mr. Jie Li, Ms. Runyou Liu, Mr. Xingyu Zhou

An outbreak caused by the co-infection of Sapovirus and Norovirus at a university in Jiangxi Province, China, 2018
Ms. Xianxiang Ding, Mr. Guomin Zhang, Dr. Lijie Zhang

Acute gastro-enteritis outbreak following intake of food offered to the deity in an urban locality, Coimbatore District, Tamil Nadu, India, 2018
Dr. S Abishek, Dr. Ponnaiah Manickam

Foodborne gastroenteritis outbreak among patrons of a local eatery, Fijai, Western Region, Ghana-2018
Ms. Vida Kwofie, Mr. Daniel Agudey, Ms. Irene Amedzro, Ms. Safiatu Tari Abdullahi, Mr. Charles Lwanga Noora, Ms. Joyce Bagina, Mr. Ebenezer Kofi Mensah, Dr. Ernest Kenu

Norovirus GII.P16-GII.4 Sydney outbreak among wildfire evacuation shelter populations — Butte County, California, November 2018
Dr. Ellora Karmarkar, Dr. Seema Jain, Mr. Jeffrey Higa, Ms. Jazmin Fontenot, Ms. Regina Gallick Bertolucci, Ms. Thalia Huynh, Dr. Gwendolyn Hammer, Ms. Alice Brodkin, Ms. May Thao, Mr. Blake Brousseau, Ms. Danielle Hopkins, Ms. Emily Kelly, Ms. Madison Jablonski-Sheffield, Mr. Sandy Henley, Ms. Holly Whittaker, Mr. Chao-Yang Pan, Ms. Alice Chen, Dr. Janice Kim, Dr. Lori Schaumleffel, Dr. Erin Epson, Dr. Shua Chai, Dr. Debra Wadford, Dr. Duc Vugia, Dr. Linda Schultz-Lewis, DVM, MPVm

A water-borne outbreak of norovirus and multiple diarrheagenic Escherichia coli infections during Eid-Karasu, Turkey, August 2018
Dr. Zeynep Ozge Ozguler, Dr. Mehmet Akif Sezerol, Dr. Serap Cetin Coban, Dr. Fehminaz Temel

Session B: Vaccine-preventable Diseases; Moderators: Sara Lowther, Oyeladun Okunromade; Friday, 1 November 2019, 10:30am; Venue: Cherry

Epidemiology of Rubella in Nigeria, 2013-2017
Dr. Aisha Sadauki, Dr. Oyeladun Okunromade, Dr. Arhyel Malgwi, Dr. Mahmood Dalhat, Dr. Hyelshilni Waziri, Dr. Muhammad Shakir Balogun, Dr. Chikwe Ihekweazu

Investigation and control of Measles Outbreak in Dehdadi district, Balkh Province, Afghanistan, 2017
Dr. Aminullah Shirpoor

An Internet-Based Survey of Influenza Vaccination Uptake among Health-Care Workers – China, 2018-2019 Season
Mr. Yayun Tan, Dr. Luzhao Feng, Dr. Ying Qin, Ms. Zhibin Peng, Dr. Jiandong Zheng, Mr. Tiantian Li, Mr. Wei Zhang, Ms. Jing Zhang, Ms. Qian Xu, Mr. Zhiqiang Guo, Ms. Junhua Yao, Ms. Fen Pang, Ms. Teng Ma, Ms. Wenjing Duan, Dr. Yali Zhang

Measles outbreak investigation and public health response in Kasserine district, Tunisia, 2019
Dr. Mhamdi Dalel, Dr. Moncef Mhamdi, Dr. Hajer Letaief, Prof. Nissaf Ben Alaya
Japanese Encephalitis vaccination coverage and its associated factors in Phu Thien district, Gia Lai province, Vietnam, 2018

Mr. Thang Hoang Nghia, Dr. Duoc Pham Tho, Mrs. Thao Phan Thi Thanh Thao, Ms. Quyen Thanh Thi Le, Ms. Oanh Tran Thi Hoang

Maternal Knowledge and Infant Uptake of Valid Hepatitis B Birth Dose at Routine Immunization Clinics in Enugu State - Nigeria, 2018

Dr. Uchechukwu Okenwa, Prof. Magbagbeola D Dairo, Dr. Eniola Bamgboye, Dr. Olufemi Ajumobi, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Session C: Occupational and Environmental Health; Moderators: Carmen Sanchez Vargas, Thomas Waite; Friday, 1 November 2019, 10:30am; Venue: Poplar

Determining the utility of national real-time ambulance syndromic surveillance to identify and monitor the adverse health impact of extreme weather events and seasonal respiratory infections in England

Mr. Simon Packer, Mr. Paul Loveridge, Ms. Ana Soriano, Dr. Roger Morbey, Dr. Dan Todkill, Mr. Ross Thompson, Ms. Tracy Rayment-Bishop, Dr. Richard Pebody, Ms. Cathryn James, Ms. Hilary Pillin, Dr. Alex Elliot, Prof. Gillian Smith


Dr. Tamuno-Wari Numbere, Dr. Ikeola Adeoye, Prof. Olufunmilayo Fawole, Dr. O Morakinyo, Dr. Mabel Aworh, Dr. Adedoyin A Fetuga, Dr. Ibitein Okeafor, Dr. Muhammad Shakir Balogun

Necrotizing fasciitis (NF), agriculture business and factors associated with NF-related disability and mortality, Thailand, 2014 - 2018

Dr. Panupong Tantirat, Dr. Thanit Rattanathumsakul, Dr. Hirunwut Praekunatham

Effectiveness of Quality Improvement on Occurrence of Needle Stick Injuries in Harare City, Zimbabwe, 2017: A Quasi-experimental Study

Ms. Zvanaka Sithole, Dr. Prosper Chonzi, Dr. Gerald Shambira, Ms. Tsitsi Juru, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Urogenital schistosomiasis outbreak in a Basic School, Ketu North District, Volta Region, Ghana-2018

Dr. Paul Dsane-Aidoo, Ms. Magdalene Akos Odikro, Mr. Holy Alomatu, Dr. Donne Ameme, Mr. Desmond Ametepi, Dr. Priscillia Nortey, Dr. Ernest Kenu, Prof. Edwin Afari

Evaluation through outbreak simulation exercise points to need for considerable improvement in the capacity of peripheral health workers for outbreak detection and response, South India, 2018

Dr. Karishma Kurup, Dr. Ponnaiah Manickam, Dr. M Prakash, Dr. G Velmurugan

Session D: Maternal and Child Health; Moderators: Latifat Ibisomi, Brian McCarthy; Friday, 1 November 2019, 10:30am; Venue: Willow

Epidemio-clinical profile of childhood cancers in Yaounde at the Mother and Child Center, 2016-2017

Dr. MBELLA Maurice Rocher, Dr. F. NGO SACK, Dr. Dorine Bernadette NGONO NOAH, Prof. Paul KOKI NDOMBO, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA
Factors associated with neonatal deaths among neonates admitted to the David Bernardino Pediatric Hospital, 2017-2018, Luanda, Angola

Dr. Dora Victorino, Dr. Joaquim Dias, Dr. Balbina Felix, Dr. João Pires

Association between Incidence of Hand-Foot-and-Mouth Disease and Meteorological Factors in Jiangyin City, China, 2012-2017

Mr. Jun Li, Ms. Yanru Zhang, Dr. Quan Chen, Dr. Rongqiang Zu


Dr. Victoria Fields, Dr. Norbert Soke, Dr. Ann Reynolds, Dr. Lin Tian, Dr. Lisa Wiggins, Dr. Matthew Maenner, Dr. Carolyn DiGuiseppi, Dr. Tanja Kral, Dr. Laura Schieve

An institution-based study on risk factors associated with mortality in children under five years old with Severe Acute Malnutrition in Limpopo Province-South Africa, 2014-2018

Ms. Fhatuwani Gavhi, Dr. Villyen Motaze, Dr. Lazarus Kuonza

Microcephaly in neonates in the context of Zika epidemic-Metropolitan Region, Dominican Republic, 2016-2017

Dr. Rannily Rojas, Dr. K. Romero, Dr. R. Pimentel

Spousal Communication, Fertility Preference and Contraceptive Uptake Among Couples in Oyo State: A Rural-Urban Comparison

Dr. Lois Olajide, Dr. Ayodeji Ayodeji, Dr. Eniola Bamgboye, Dr. Muhammad Shakir Balogun
Session A: Infections Transmitted through Food and Water; Moderators: Martyn Kirk, Eric Mintz; Tuesday, 29 October 2019, 10.30 am, Venue: Dogwood
Outbreak investigation of Salmonella: ALshenan province, Hail, Saudi Arabia, 2018. A case-control study

Tuesday, 29th October - 10:30: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 48

Dr. ahmed sabur, Prof. Eman Abd-Ellatif

Background
On July 31st, 2018, Hail city reported an unexpected number of gastrointestinal illnesses had presented to Alshenan General Hospital. Patients reported a similar history of eating breakfast at the same restaurant. In Saudi Arabia, foodborne illness represents a major public health issue with more than 2,000 documented cases of foodborne illness in 2016. The objectives of the investigation were to determine the source of infection and the causative agent.

Methods
We conducted a case-control study to identify the source of the outbreak. We defined cases as persons who ate food from Restaurant A in Alshenan province on Tuesday 31 July 2018 and developed gastrointestinal illness. Controls were persons who ate food from Restaurant A without reporting symptoms. We collected information on demographics, symptoms, and food history using a semi-structured questionnaire. We reviewed hospital records for symptoms and clinical course. We reviewed available laboratory results for cases, food handlers, and environmental samples.

Results
We interviewed 87/104 cases (83.7%): 5 cases were hospitalized and no deaths occurred. The median age of cases was 27 years (range: 3-70 years), and 41% were male. All cases reported diarrhea, other reported symptoms included abdominal cramps (98%), fever (94%), headache (85%) and vomiting (71%). The incubation period ranged from 8-52 hours. Out of 56 rectal swabs from cases, 10 (18%) were Salmonella spp. positive. Widal testing on the food handlers was positive for Salmonella paratyphi for 4/6 (66%). Cases (98%) were significantly more likely to report eating falafel than controls (82%) (OR=9.6, P VALUE 0.00); cases (98%) were also significantly more likely to report eating hummus than controls (74 %) (OR=15.3, P VALUE 0.00). Laboratory testing isolated Salmonella spp. from both items.

Conclusion
Based on symptoms, incubation period, the epidemiological investigation, and laboratory results, this outbreak was most likely caused by Salmonella spp. contamination of falafel and/or hummus. These food items were served together and share common ingredients; we were unable to more definitively identify the source of the outbreak. We recommend additional training on safe food preparation and routine examinations of restaurants and food preparation practices.

Keywords: Salmonella, foodborne, investigation, Alshenan
Level and determinant of botulism awareness as a measure of disease protection from home canned and preserved foods—Karasiuskei District, Osh Province, Kyrgyzstan, 2019

Tuesday, 29th October - 10:50: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 134

Dr. Nazgul Abamuslimova

Background
In 2018, 30 small outbreaks of botulism, involving 61 individuals with two fatalities, occurred in Osh Province in Kyrgyzstan. Home-canned fruits and vegetables were the source of disease in those incidences. During March-April, 2019, we conducted a population-based household survey in Karasiuskei, a typical and representative district of Osh province in Kyrgyzstan. The objectives were to estimate the level of botulism awareness and its determinants with regard to home-canned and preserved food to suggest recommendations that can help reduce disease incidence.

Methods
We randomly selected and interviewed 470 housewives. We defined botulism awareness based on individuals’ responses related to questions on food home-canning and preservation practices, ability to recognize food spoilage, understanding the risk of botulism from improperly preserved or canned food. We also collected information on the demographics and other relevant individuals’ characteristics. We used logistic regression to assess the disease risk factor associations.

Results
All housewives prepare home-canned and preserved food. Only 20% (96/470) are well aware of botulism and its sources and they follow proper food preservation and canning practices. The highest rate of awareness was 39% (73/187) among those who had good access to information from mass media sources, or heard about the disease from friends 39% (58/148). Low rate, 10% (15/144), was observed among those aged <30 years. In multivariate analysis, factors associated with good botulism awareness were: access to information from mass media (OR=5.1; 95% CI 2.9-8.8), gained disease knowledge from friends (OR=3.1; 95% CI 1.8-5.4), and are more than 30 years of age (OR=2.1; 95% CI 1.1-4.1).

Conclusion
This study provides evidence of low botulism awareness with respect to home-canning and preservation of food. To meet the need of improving disease awareness, we recommend the provision of well-designed and properly channeled educational messages that can reach the majority of the general public through appropriate mass media.
Foodborne Outbreak After a Village Festival — Kulon Progo District, Indonesia, 2019

Tuesday, 29th October - 11:10: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 195

Ms. Iffa Karina Permatasari, Mrs. Nurjanna Nurjanna, Mr. Sugianto Sugianto, Dr. Titik Hidayati, Mrs. Tutik Inayah Susilaningsih

Background
On March 30, 2019, Sentolo I Public Health Center (PHC) reported three cases of suspected foodborne outbreak after a village festival in Kaliagung Village, Sentolo Kulon Progo. Investigation was done to ensure outbreak, identify the risk factors and prevention measure.

Methods
We used the guests list to conduct active case finding. Analytical study was carried out with case-control design. Case was a person who experienced one of the gastrointestinal symptoms, namely nausea, vomiting, abdominal pain, and diarrhea, after consuming snacks from Kaliagung Village Festival on March 30, 2019. Data were collected using standardized questionnaire. Interviewing food handlers and observation were done for environmental investigation. Odds ratio was estimated to determine food with highest risk of getting ill. Food and stool samples were collected and tested at Yogyakarta Health Laboratory.

Results
Of the 130 people on the list, 102 were successfully interviewed. There were 40 cases (AR=22.2%), with the main symptoms of nausea, vomiting, and dizziness. The incubation period was 30 minutes-9 hours, with an average of 2 hours. Of all types of food served, only rolled coconut pancake significantly associated with food poisoning (OR=31.6 95% CI=7.4-278.3). The pancake was cooked 12 hours before serving and stored in room temperature, also rolled by food handler who washed hands without soap. Samples of pancake, murtabak, and stools were positive for *Staphylococcus aureus*.

Conclusion
A food poisoning outbreak occurred on March 30, 2019, in Kulon Progo District after consuming rolled coconut pancake contaminated with *Staphylococcus aureus* at the Kaliagung village festival with risk factors of long-time storage in room temperature and unskilled food handler. Visual or written reminder on washing hand with soap is needed at the food handler’s kitchen. PHC should give food safety education for small home industries regarding proper cooked food storage and personal hygiene.
10th TEPHINET Global Scientific Conference

Typhoid Outbreak Investigation Conducted in Lundazi District, Zambia, 2019

Tuesday, 29th October - 11:30: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 394

Mrs. Nelia Mulambya, Mr. Hurst Mwewa, Mr. Jordan Banda, Mr. Francis Nanzaluka, Mr. Bernard Khoza, Dr. Jairos Mulambya, Dr. Davy Zulu, Dr. Kennedy Kabuswe

Background
In February 2019, Lundazi District Health Office received a report of a suspected typhoid outbreak at a zonal clinic catchment area. We investigated to confirm the outbreak, identify the causative agent, identify the source and contain the outbreak.

Methods
We defined a suspected case of typhoid as the occurrence of fever (temperature > 38°C) for one or more weeks among residents of a remote region of Lundazi from 29th January to 5th March 2019. We conducted active case search in affected villages, reviewed out-patient registers and clinical records to abstract data on demographic characteristics, clinical symptoms, laboratory investigations, and outcome. We interviewed suspected case-patients and collected blood samples from three suspected case-patients who had not taken antibiotics for culture and sensitivity. We collected data on sanitation facilities, cleanness of the environment and main sources of drinking water. We collected two water samples from a common source and tested using Hydrogen Sulphide and laboratory-based bacteriological tests.

Results
We identified 34 suspected case-patients, (incidence rate 17 per 1,000). Three deaths occurred during the outbreak (case fatality rate=9%). More than 50% of suspected cases were children between 1-14 years (attack rate=17.5 per 1,000). Females (56%) were slightly more affected than males. We isolated *Salmonella typhi* from three cases by blood culture. The index case was seen on January 29th and the outbreak peaked in February. Clinical symptoms included fever (100%), malaise (91%), abdominal pain (88%), and diarrhea (79%). Affected villages had no toilets so open defecation was common. Both water samples were hydrogen-sulfide test positive and culture showed fecal coliforms and *E.coli*.

Conclusion
The outbreak investigation suggested that the outbreak was due to the consumption of contaminated water, poor sanitation, and poor personal hygiene. We recommended interventions such as health education on water safety, hand hygiene and sanitary disposal of fecal matter to prevent future typhoid outbreaks.
Shigellosis Outbreak Investigation - Mizan Tepi University, Southern Ethiopia, February, 2019

Tuesday, 29th October - 11:50: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 350

Dr. Henok Solomon, Dr. David Sugerman, Dr. Samrawit Solomon, Mr. Mohammed Nasir, Mr. degefu beyene, Ms. Jimmawork Wondimu

Background
Shigellosis is the second leading cause of diarrheal mortality accounting for a million deaths worldwide nearly all in developing countries due to poor sanitation. On February 7th, 2019 Mizan Tepi University reported diarrheal cases among students. We investigated to confirm the outbreak, describe the magnitude, and determine possible risk factors of the outbreak.

Methods
A study was conducted at Mizan Tepi University main campus using a 1:2 case-control study with 150 study participants (50 cases and 100 controls) from Feb 08-20, 2019 among students. A case was any person from the campus with an acute onset of diarrhea between January 29 to February 20, 2019 and a control was any person from the campus not meeting the case definition. Data was collected using a structured questionnaire. Bi-variate & multi-variable analysis was done to identify risk factors. Stool culture with antimicrobial susceptibility testing (AST) and testing of water samples from the drinking water reservoir and Shonga River (which cross the campus) for coli-forms was done.

Results
We identified a total of 468 cases with Shigella flexneri in 64% (9/14) of cultured stool samples, sensitive only to Ciprofloxacin. The attack rate was 8.6% without deaths. The reservoir and Shonga river were positive for fecal coliforms. Sharing a dorm with a case (AOR=4.14: 95% CI: 1.4-12.0), contact with a diarrheal case (AOR=3.8: 1.3-11.2) and history of cafeteria water consumption (AOR= 3.5: 95% CI: 1.1-11.24) were associated with increased odds of illness. Drinking bottled water (AOR=0.18, 95% CI: 0.06-0.56) and hand washing following toilet use (AOR=0.28, 95% CI: 0.08-0.9) during the outbreak period reduced odds of infection. Students reported cafeteria staff using Shonga River water to clean plates and utensils during piped water interruption.

Conclusion
Contamination of the cafeteria water supply is the likely source of the outbreak with secondary spread among students. Regular hand washing with soap and avoiding food preparation by sick person are recommended to prevent person to person transmission. Chlorination of the water reservoir, avoiding use of river water by the cafeteria staff, regular supervision of food handling and preparation, and providing hand washing at latrines are recommended to prevent future outbreaks.
Geographic Mapping of Cholera Hotspots in Tanzania, 2010-2018: A Tool for Identifying Priority Areas for Intervention

Tuesday, 29th October - 12:10: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 441

Ms. Jane Mcharo, Dr. Rogath Kishimba, Ms. Loveness Urio, Ms. Senga Sembuche, Dr. Ali Nyanga, Dr. George Kauki, Dr. Ahmed Abade, Dr. Janneth Mghamba

Background
In the past 10 years Tanzania has experienced several waves of cholera outbreak affecting all the 26 regions of the country. To address this in the year 2010-2018, the Government of Tanzania was committed to develop a road map to eliminate cholera by 2030. However for elimination to be successful cholera hotspots must be identified and specifically targeted for interventions. We used mapping to identify cholera hotspots in Tanzania and guide the development of the elimination roadmap.

Methods
Cases are defined in the surveillance system as confirmed. Weekly cholera case counts by district were obtained from integrated disease surveillance and response weekly ending reports (IDWE) for the period from January 2010 through June 2018. Annual population estimates by district were extrapolated from 2012 Census estimates and 2016 and 2017 projections from the Tanzania National Bureau of Statistics. Three ranking criteria including mean annual incidence, maximum annual incidence and stability were employed and converted into scores to capture multiple facets of disease burden.

Results
In total, 29053 cases and 380 deaths (Case Fatality Rate 1.3) of cholera were reported during 2010 and 2018. The mean annual incidence ranged from 0.00-0.70 cases/1000 persons/year, while the maximum annual district specific incidence ranged from 0.00-4.7x cases/1000/yr. Stability ranged 0.00-1.65 cases/1000. Of the 184 districts in Tanzania 45 were identified as priority/hotspot areas based on the three criteria. Approximately 29% of the population of Tanzania lives in these districts.

Conclusion
We identified cholera hotspots in Tanzania and estimated the population at risk in hotspot districts. Selecting the right areas within the hotspots for targeting interventions followed by impact assessments of the interventions could eliminate cholera in these areas of Tanzania.
Session B: Vector-borne Diseases; Moderators: Tim Doyle, Linda Quick; Tuesday, 29 October 2019, 10:30am, Venue: Cherry

Tuesday, 29th October - 10:30: Session B: Vector-borne Diseases (Cherry) - Oral - Abstract ID: 10

Mr. Abadi Abebe, Ms. Jimmawork Wondimu, Dr. Dejen Kassa (Lecturer and researcher, Hawassa University)

Background
Malaria causes about 300 to 500 million episodes of acute illness and 1.2 million deaths per year globally. In Ethiopia, malaria is highly seasonal in many communities and is unstable in other areas with epidemic-prone transmission pattern. Unusual increment of malaria case was reported from Dilla Town surveillance officer on March 7, 2017. We investigated to describe the epidemiology, identify risk factors, and recommend preventive measures.

Methods
We defined suspected malaria patient with fever or history of fever in the last 48 hrs and lives in malaria endemic areas or has history of travel within the past 30 days to malaria-endemic areas and used microscopic and rapid diagnostic tests to investigation and confirm the disease and reviewed the previous year’s malaria data to establish a threshold level and to understand the trends of the disease. We conducted descriptive analysis followed by unmatched case-control study using a standard structured questionnaire to identify risk factors. We assessed presence of mosquito breeding site, Anopheles larvae in affected area of the town using observation.

Results
Out of 9633 suspected cases, 3448(35.7%) were confirmed malaria cases, with plasmodium municipal accounting for 2052(59%). Person 15 years and older were most affected with an Attack rate of 54%. Male were more affected than female with Attack rate of 46.5 per 1000 population. The most affected kebelle were Odeya kebelle with Attack rate 13.6 per 1000 population. Presence of mosquito breeding sites within less than 1000m distance to the community and households not having awareness on long lasting insecticide nets utilization was identified as a risk factor and associated with malaria outbreak with an Adjusted odds ratio of 16.29[95% CI=3.39-79.49,10.83(95%CI=2.24-52.42) respectively.

Conclusion
This was a malaria outbreak during the investigation in Dilla Town associated with presence of stagnant water and having poor awareness on long lasting insecticides nets use. We recommended improving awareness of long lasting insecticide nets utilization and environmental management through optimized community participation.
Dengue Fever Outbreak - Al Qahirah and Al Mudhaffar Districts, Taiz Governorate, Yemen, November 2018

Tuesday, 29th October - 10:50: Session B: Vector-borne Diseases (Cherry) - Oral - Abstract ID: 186

Dr. Abdulkareem Nassar, Dr. Amr Torbosh, Mr. Yassin Abdulmalik, Dr. Mohammed Al Amad, Prof. Abdul Wahed Al Serouri

Background
Dengue Fever (DF) is a significant health problem in Yemen. On November 6th 2018, the surveillance officer in Taiz governorates reported an increased number of suspected DF with deaths from Taiz City. On November 7th 2018, a team from field epidemiology training program was sent to confirm the existence of outbreak, determine risk factors and recommend control measures.

Methods
Descriptive followed by case-control study (1:2 ratio) was conducted. Case-patient defined as any person who met the definition of DF according to WHO, living in Al Qahirah or Al Mudhaffar districts during August 5th to November 13th 2018. Control is any person living in Al Qahirah or Al Mudhaffar Districts and did not suffer from DF. Data collected on individual, environmental and behavioral risk factors. Attack rate, odds ratios (OR) and 95% confidence intervals (95%CI) were calculated. p value < 0.05 was considered as the cut point for significant. Nineteen blood samples were collected for lab confirmation. Epi info version 7.2 was used.

Results
Fifty patients were found. 52% were males. 76% were <30 years old of age. Overall attack rate was 1/10,000 of population. Case fatality rate was 4%. There were significant associations between DF and illiterate-secondary education (OR=5.2, 95%CI:2.2–12.8), not working (OR=9.6, 95%CI:4.3–21.4), uncovering water container (OR=2.8, 95%CI:1.3–6.1), not using mosquito repellent (OR=4, 95%CI:1.3–12.3), not using mosquito nets (OR=15.5, 95%CI:2-118), wearing short clothes (OR=15.8, 95%CI:5.3-47.5), bad around the house (OR=3.3, 95%CI:1.6–6.7), bad sanitation (OR=4.4, 95%CI:2.1–9.0), outdoor trees (OR=2.4, 95%CI:1.2–5.1) and not screening windows (OR=10.6, 95%CI:4.8-23.5). Out of 19 blood samples,11 (58%) were positive for DF IgM.

Conclusion
DF outbreak was laboratory confirmed. The identified risk factors have been proven to contribute in DF infection. Implementation of control and prevention measures to alter the related factors (e.g. covering water containers, elimination the breeding sites of vector and use individual protective measures). Raising community awareness regarding transmission and preventive measures. Strengthening surveillance system sensitivity is perquisite.
Dr. Mary Kaevakore, Mr. James Flint, Dr. Mathias Bauri, Mr. Berry Ropa

Background
On June 9, 2017, we received notification of a sudden increase in febrile illness cases, including three deaths, from two villages in Morobe Province. Belief that the outbreak was caused by sorcery led to violent conflict between the affected villages. We conducted an outbreak investigation in order to verify the outbreak, determine its aetiology and dispel supernatural beliefs to minimize civil unrest.

Methods
A house-to-house survey of all homes in the two villages was conducted for active case finding. Cases were defined as ‘any resident of Marile or Yaga village with an onset of self-reported fever from Apr 30, 2017 to June 24, 2017’. Serum was obtained for malaria and dengue rapid tests and further testing at a referral laboratory. Water specimens from village wells were obtained for contaminant testing. Medical records of hospitalized patients were reviewed. Demographic and clinical data were analysed. Village meetings were held to update residents of both villages on the investigation’s progress.

Results
A total of 98 cases from the two villages (attack rate 18%) met the case definition. Age of cases ranged from 2.5 months to 62 years (median 11 years); 57% were male. Three deaths (3%) occurred, all boys aged 8 years. Nine of forty (23%) sera tested positive for Malaria and two of nineteen (11%) for Dengue. Water specimens were negative for E. coli and Salmonella. Eighteen blood specimens that were sent to a referral laboratory were all negative for zika and chikungunya. Two village meetings assisted in bringing a peaceful resolution to the armed conflict.

Conclusion
An outbreak of an unknown febrile illness/illnesses occurred in these two villages. Given endemic dengue and malaria, aetiology was not determined. Despite that, the investigation alleviated fears and helped bring peace to the villages. Mosquito nets were distributed. Enhanced febrile illness surveillance initiated post-investigation showed no recurrent outbreaks.
Perception and Adherence to use of Malaria Rapid Diagnostic Test among Health Care Workers – Nigeria, March 2018

Tuesday, 29th October - 11:30: Session B: Vector-borne Diseases (Cherry) - Oral - Abstract ID: 622

Dr. Mamman Aliyu Na’uzo, Prof. Dahiru Tukur, Dr. Muawiyyah Sufyan, Dr. Olufemi Ajumobi, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Background
In 2010, the World Health Organization recommended the test before treatment policy using Malaria Rapid Diagnostic Test (mRDT). Despite the introduction of this policy, presumptive diagnosis and prescription of antimalarial to RDT-negative patients persist in most sub-Saharan African countries. We assessed Health Care Workers (HCWs) perception and adherence to use of mRDT and factors associated with adherence to test results in Sokoto metropolis, Nigeria.

Methods
We conducted a cross-sectional study among HCWs in primary and secondary health facilities. Using a multi-stage sampling technique, we selected 262 respondents from different cadres of HCWs. We interviewed the respondents to collect data on demographic characteristics, perception, and adherence to test result. We calculated and categorized perception score into good, fair and poor. We categorized adherence to test result as good or poor. We conducted descriptive statistics and used multivariable logistic regression to estimate adjusted odds ratios (aOR) and confidence intervals (CI) to identify associated factors.

Results
Respondents' median age was 32 years (interquartile range= 27-39). Mean years of practice was 7.29±6.6; 155 (59.2%) were females, 190 (72.5%) work in Primary Health Care facilities, 112 (42.7%) were Community Health Workers, 179 (67.9%) had National Diploma Certificate and 118 (45.0%) had at most four years of practice. Perception was good in 43.5% and fair in 55.7% while 80.5% have good adherence to test results. The predictors of adherence to mRDT results were, presence of fever in the patient (aOR: 0.39, 95% CI: 0.18-0.83) expectation of the patient to be given anti-malarial (aOR: 0.33, 95% CI: 0.15-0.70) by the physician and training on malaria case management (aOR: 2.70; 95%CI: 1.30-5.56).

Conclusion
The high level of adherence to test result is commendable and may be attributed to training on case management. We enlightened HCWs and shared our findings with the Ministry of Health, Sokoto. We recommended continuous training of HCWs on case management.
Mayaro Fever outbreak in the Chirumbia Valley, Province of La Convención, Cusco-Peru Region, 2018: Could it be considered an occupational disease?

Background
In May 2018, the Health Network of La Convención reported an outbreak of febrile eruptive disease, in the Chirumbia Valley, in people who worked entering the forest in a rural sanitation project. Objective: to describe the outbreak, identify the agent, evaluate association with the activity performed and determine the presence of the possible vector.

Methods
A cross-sectional and retrospective cohort study was designed. Searching for any case of eruptive fever. An epidemiological record was applied to 127 people, with follow-up home visits of 6 months to confirmed cases. Cases were confirmed by RT-CRP, IgM antibodies, and clinical epidemiological correlation. The entomological study was carried out, determining the aedic index and catching other mosquitoes in populated centers, camps, coffee plantations and forests.

Results
Mayaro fever was identified as the outbreak disease. The index case was a person who attended the arrival of Pope Francis in the neighboring Madre de Dios Region, which had active cases of the disease. Between March-July 2018, 35 cases were confirmed (3 by PCR, 29 by IgM and 3 by clinical-epidemiological correlation), discarding 92 cases. The average age was 42.7±14 years; 60% were male. The most affected community was Santusaires (57.1%). The attack rate was 27.56%. The confirmed cases presented: arthralgias (94.3%), myalgias (85.7%), fever (77.1%), headache (71.4%), lumbago (62.8%), chills (60%) and rash (51.4%). 2 cases were hospitalized, and in the confirmed cases the arthralgias (often intense) remained intermittently for an average of 20±2.5 weeks. Carrying out rubbing and stripping activity in the rural sanitation project was identified as a risk factor (RR=9.44,[IC95%=4.25-20.98],p=0.000). Sabethes and Culex mosquitoes presence were identified as potentially responsible for transmission.

Conclusion
Mayaro Fever outbreak was confirmed as an emerging disease in the Chirumbia Valley, with a significant presence of intense and prolonged arthralgia, and associated with work in a rural sanitation project. It is necessary molecular studies that explain the long period of convalescence of those affected, which could be associated with the circulating genotype. Mayaro fever should be considered as an occupational disease. Mayaro Fever is in the process of inclusion as a notifying disease in Peru.
Session C: Public Health Surveillance; Moderators: Arun Balajee, Germain Bukassa; Tuesday, 29 October 2019, 10:30am; Venue: Poplar
Evaluation of overdose surveillance at overdose prevention sites in Vancouver, Canada, 2019.

Ms. Jessica Prairie, Mr. Tim Chu, Ms. Cher Ghafari, Dr. Mark Lysyshyn, Ms. Helenka Jedrzejowski, Mrs. Elizabeth Holliday, Ms. Sara Forsting

Background
In 2016 a public health emergency was declared in British Columbia, Canada due to an increase in drug-related overdoses and deaths. This allowed for rapid public health response, including the implementation of overdose prevention sites (OPSs). OPSs are low-barrier sites that offer supervised drug consumption and other harm reduction services. Overdose response at OPSs is performed by staff generally consisting of volunteers and peers with lived experience. Surveillance at OPSs monitors for trends in overdose events to inform public health action. In 2019, an evaluation was conducted to assess if the surveillance system was meeting objectives.

Methods
A mixed methods approach was used to evaluate three surveillance system attributes: acceptability, usefulness, and data quality. All three attributes were evaluated qualitatively through OPS visits (n=6) and informal conversational interviewing with site staff (n=20). Data quality was further assessed quantitatively by comparing line-list to aggregate data collected by the sites in 2018.

Results
Respondents generally indicated that the data collection experience was acceptable; the data collection form was straightforward and easy to understand. Respondents indicated information in the weekly report was useful but reported variability in the extent to which they reviewed the data. OPS visits and overdoses were recorded and/or entered differently across sites, making data comparison across sites difficult. Variance was noted between line-list and aggregate data at most sites due to differences in what was being counted at each site and entered into the system, as well as counting and data entry errors.

Conclusion
OPSs are an innovative and novel approach to reduce the harms associated with substance use. Overdose surveillance at OPSs provides actionable public health information not otherwise available. The system is acceptable to staff collecting data and data contained in the OPS weekly report is useful. Recommendations on how data is collected and entered have been identified to improve data quality.
Quality of Malaria Case Management under Different Transmission Settings - Tanzania Mainland, 2019.

Tuesday, 29th October - 10:50: Session C: Public Health Surveillance (Poplar) - Oral - Abstract ID: 407

Dr. Ally Hussein, Dr. Rogath Kishimba, Mr. Frank Chacky, Prof. Donath Tarimo

Background
Tanzania is currently under an epidemiological transition of malaria transmission with parts of the country having <1% (hypoendemic; pre-elimination) and >10% malaria prevalence (mesoendemic). Hypoendemic areas in the pre-elimination phase require high testing rates for fever cases and appropriate treatment of cases. There are few data on the quality of malaria case management in pre-elimination settings. We evaluated the association between malaria endemcity and case management quality.

Methods
An analytical cross-sectional study was conducted amongst 1,713 health facilities (HF) from all 26 regions of Tanzania Mainland during January through March 2019. Secondary data were collected following introduction of an assessment tool for HF readiness and performance of malaria case management by the National Malaria Control Programme. HF performance were mapped according to malaria endemcity. Mean case management scores from facilities in different transmission settings were compared by t-test. Simple and multiple linear regression analyses were performed to determine the association between HF performance and endemcity (mesoendemic vs. hypoendemic).

Results
HFs located in hypoendemic settings fared poorly than those in mesoendemic settings in terms of the overall quality of services [Difference in mean scores = 2.52; (95 % CI -3.85, -1.19)], readiness [Difference in mean scores = -2.97; (95 % CI -4.53, -1.39)], availability of malaria reference materials [Difference in mean scores = -4.91; (95 % CI -7.71, -2.10)], information system tools [Difference in mean scores = -5.92; (95 % CI -7.78, -3.93)] and client satisfaction [Difference in mean scores = -6.61; (95 % CI -9.39, -3.84)]. HFs in rural areas were also found to perform better [β: 4.12; (95 % CI 2.34, 5.89)].

Conclusion
HFs located in hypoendemic settings performed poorly compared to those in mesoendemic settings. The findings have major implications for areas aiming at eliminating malaria. Further studies are required to establish factors associated with poor quality of malaria case management in hypoendemic settings.
Ebola Virus Disease Surveillance System Evaluation, Boke region, Guinea, 2019

Dr. Fatoumata Doumbouya, Dr. Jolie Kasongo Kayembe, Dr. Salomon Corvil, Dr. Claude Ngona Mandro, Dr. Sakoba Keita

Background
In 2014, following the West Africa’s Ebola Virus Disease (EVD) outbreak, WHO declared EVD as a Public Health Emergency of International Concern. Guinea has established a surveillance system to detect early and respond promptly all cases of EVD. The purpose of this evaluation is to determine whether the system is meeting its objectives to make recommendations to improve the system

Methods
CDC guideline 2001 was used to evaluate the system. A structured questionnaire was administered to surveillance officers to health districts of Boké region and heads facilities selected according to their commitment in EVD surveillance. The EVD surveillance database was reviewed between 2014 and 2018. Simplicity, acceptability, timeliness, data quality, flexibility, positive predictive value (PPV), and utility were assessed based on respondent responses and revision of surveillance tools

Results
Simplicity: 85% of the interviewees had a case definition, 70% found it easy to use, although investigation case form was easy to fill out, all respondents said that data entry into two databases took a lot of time. Acceptability: 100% of respondent were willing to do surveillance of EVD. Between 2014 and 2016, the timeliness: 100% of cases were detected within 24 hours after symptoms onset and reported to national level promptly, however, data quality was 62%. Flexibility: case definitions were changed three times during the epidemic and used easily except post-epidemic period by underreporting of five cases detected by active research during evaluation. The PPV was 3%. Useful: system detected seven EVD outbreak were responded promptly

Conclusion
EVD surveillance system is meeting his objective. It’s useful, simple but complex for data entry, acceptable, flexible, and prompt with low data quality and low PPV during outbreak period. However, EVD system is little flexible post outbreak. Heads of facilities were sensitized on case definition. Efforts should be done to use one database to enter data integrating EVD surveillance into the Integrated Disease Surveillance and Response (IDSR), improve data quality and follow head of facilities on case definition post ebola outbreak.
Background
Kerala state in India suffered the worst flood ever in August 2018, affecting 5.4 million people and caused 483 deaths. Considering the potential risk of communicable diseases, we established private healthcare facilities (PHF) disease surveillance to identify early warning signals for outbreaks.

Methods
We initiated a daily disease surveillance system from PHF in 12/14 flood-affected districts with >30% water-logging for >3 days. Based on the WHO Early Warning Alerts and Response Network tool and the Integrated Disease Surveillance Programme’s (IDSP) syndromic and presumptive case definitions for 13 diseases, we sensitized PHF to report cases through MS Excel, web application or text messaging. Data were collated at district and state levels for disease trends and outbreaks, and shared with the state/district surveillance units.

Results
We completed 276 sensitization meetings and 754 PHF visits. A total of 10,222 cases from 476 PHF (201 existing and 275 new) were reported during 26 August to 19 September 2018 [fever-52%, acute respiratory infection (ARI)-12%, leptospirosis-9%, acute diarrheal disease (ADD)-8%, dengue-7%, viral hepatitis-4% and others-8%]. About 50% leptospirosis cases were reported from Ernakulum and Kozhikode districts [median age-42 years, (range <1-85), 61% males]; 65% dengue cases from Ernakulum, Kannur, and Thrissur districts [median age-32 years, (range <1-87), 62% males]; and 59% of viral hepatitis cases from Ernakulum and Malappuram districts [median age-42 years, (range <1-85), 63% males]. In collation with IDSP data, alerts were generated for leptospirosis, dengue, viral hepatitis, ARI and ADD cases for health departments for outbreak response. Public health response within 24 hours by state government, including revised disease management advisories for PHF likely limited morbidity and mortality during outbreaks.

Conclusion
We successfully established and strengthened disease surveillance system (136% increased reporting) in PHF during the flood response. Disease alerts helped in release of revised treatment guidelines and prompt public health response.
Background
Pertussis, or whooping cough, is a highly contagious, vaccine-preventable respiratory disease. Historically, pertussis incidence was cyclic with peaks in disease every 3-5 years. In the United States, reported pertussis has increased over the past few decades despite high vaccination coverage; however, there is no clear national spatiotemporal pattern. We aimed to assess: 1) the spatiotemporal distribution of pertussis in the United States, and 2) whether geographically distinct areas share similar temporal patterns.

Methods
We used pertussis cases reported through the National Notifiable Diseases Surveillance System, and county population estimates from the U.S. Census Bureau, for 2000-2017. County-level case counts were aggregated by month. To assess the distribution of pertussis cases, and identify spatiotemporal clusters during our study period, we used Kulldorf’s spatiotemporal scan statistic (p<0.01). For each cluster of identified counties, wavelet analysis was used to quantify the timing and periodicity of pertussis incidence.

Results
National pertussis incidence over 2000-2017 averaged 6.4 cases/100,000 annually with peaks in 2004-2005, 2010, 2012, and 2014. We detected spatiotemporal clusters of high pertussis incidence, with the geographically largest clusters in the East North Central (relative risk (RR) of disease within cluster compared to outside: 3.9), New England (RR: 3.1), and northern Mountain regions (RR: 2.4). On average, clusters spanned 24 (1-331) counties and lasted 28 (4-108) months. Although there was substantial variability in the temporal pattern for each cluster, spatially distinct areas can be grouped by similar dominant periods of 12 months or >20 months.

Conclusion
Pertussis has disproportionately affected certain areas across the nation. A better understanding of the current spatiotemporal patterns of pertussis across the United States will allow us to better characterize current epidemiology, potentially helping predict and plan for the occurrence of future outbreaks.

**Ms. Gladys Mutethya, Dr. Elvis Oyugi, Mr. Joseph Ogutu, Mr. Moses Melita, Mr. Hillary Limo, Dr. Linda Makayoto, Dr. Zeinab Gura**

**Background**
Acute Flaccid Paralysis (AFP) surveillance is key in monitoring progress of polio eradication and has contributed to decrease in wild poliovirus cases from 350,000 in 1988 to 33 in 2018 globally. In 2018, traces of vaccine-derived poliovirus were isolated in environmental samples in Kenya. We described epidemiological characteristics of AFP cases and evaluated the AFP surveillance system.

**Methods**
Using WHO case definition for AFP, we reviewed AFP data in MS Access database for the period 2016–2018. We assessed demographic characteristics, clinical information, polio vaccine doses received and final case classification. Stool adequacy was defined as two stool samples, 8 grams in weight, collected 24 hours apart, ≤14 days after onset of paralysis. Descriptive statistics were calculated using Epi Info 7 and revised CDC guidelines used to evaluate the following system attributes: Simplicity (ease of information flow), representativeness (number of counties reporting AFP cases), timeliness (cases reported within 24 hours after paralysis onset) and sensitivity (annual AFP case detection rate).

**Results**
We reviewed 1,575 records; median age was 4 years (IQR: 5.9), 853 (54.2%) were male, 1,011 (64.2%) had fever, 625 (39.7%) had asymmetrical paralysis, 1,407 (89.3%) had flaccid paralysis, 1,133 (71.9%) received 2 – 4 polio vaccine doses, stool adequacy was 99% (1,559/1,575). Test results were: Negative 1,464 (93%) and non-polio enterovirus 111 (7%). All counties in Kenya reported cases; Nairobi 122 (7.8%), and Lamu 7 (0.4%) reported highest and lowest number of cases respectively. Cases reported and investigated in time were 200 (12.7%) and 1,559 (99%) respectively. System was well structured with good information flow and feedback mechanism. AFP detection rate was 0.04/100,000 in 2016; 0.22/100,000 in 2017 and 0.22/100,000 in 2018.

**Conclusion**
The surveillance system was representative, timely and simple, however the sensitivity was low. AFP surveillance should be strengthened in low reporting counties to achieve the AFP indicator targets.
Session D: Award-Eligible Presentations; Moderators: Conky Quizon, Mufuta Tshimanga; Tuesday, 29 October 2019, 10:30am; Venue: Willow

Mr. Joseph Ogutu, Dr. Maurice Owiny, Mr. Daud Mbatha, Ms. Qabale Duba, Dr. Elvis Oyugi, Dr. Linda Makayoto

Background
Rotavirus is a leading cause of severe diarrhea in children globally, it causes estimated 7% of mortality in children aged <5 years in Kenya. Kenya introduced Rotavirus vaccination in July 2014 and to date has four rotavirus sentinel sites. We sought to evaluate the surveillance system and describe reported cases.

Methods
We reviewed rotavirus-associated diarrhea data in MS Access database. We defined a case as a record of any child aged <5 years hospitalized for acute diarrhoea at Kenyatta National Hospital from 2014–2018. We collected demographic characteristics, clinical information, ELISA test result, immunization status, vaccine doses received and calculated descriptive statistics using Epi-Info 7. We used CDC guidelines to evaluate the following system attributes; simplicity (ease of data flow), acceptability (willingness to allow specimen collection), timeliness (stool samples collected, reaching site laboratory within 2 days), flexibility (adaptation to change) and positive predictive value (PVP) based on ELISA results. Data completeness was assessed using quality audit tool.

Results
We reviewed 989 records; 205/989 (21.0%) were positive for rotavirus, median age was 19 months (IQR: 16.0), males were 557/989 (56.4%), 811/989 (82.0%) had received rotavirus vaccination with only 568/989 (57.4%) receiving > 2 doses. Number of cases increased from January to March of each year and 110/989(11.1%) reported in March 2017. The system had three levels of reporting and clear data flow; 879/989 (88.9%) of samples were collected on time; the place variables were updated to reflect current devolved system. Completeness of immunization status variable was 56%, number of vaccine doses received was missing in 314/989 (31.8%) records. PVP was 20.7% (205/989).

Conclusion
The system was simple, flexible and acceptable but had low PVP. Incomplete reporting and timeliness was still a challenge. Surveillance system did not achieve herd immunity since vaccination coverage was below 95%. We recommend regular data quality assessment be conducted.
A Large Staph aureus Food Poisoning Outbreak among Hotel Guests, Sharkia Governorate, Egypt- July 2018

Dr. Hesham Magdy, Dr. Mohamed Elghazaly, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Background
An outbreak began on 24th of July 2018 when it was reported that 12 cases with moderate to severe gastrointestinal symptoms referred to hospital after having dinner in five stars hotel in Zagazig. It is a town located in Sharkia, a non-touristic governorate 80 Km east of Cairo. Outbreak investigation was performed to verify the outbreak, determine its magnitude, identify the source and implement control measures.

Methods
Active case finding was conducted through hotel and hospital medical records review. Cases were defined as any hotel guest between 24-26 July, with abdominal pain, vomiting or diarrhea. All suspected patients were interviewed using a standardized questionnaire. Nested unmatched case-control study was designed for 76 cases and 79 controls from healthy relatives or other guests to identify outbreak risk factors. Controls were chosen based on dinner attendance and willing to participate in the study. Environmental investigations for water source, swimming pools, food supplies and processing were conducted. Human, food and environmental samples were cultured and biochemically tested.

Results
Out of 954 guests attended the dinner, 163 had signs and symptoms (17.1%) with 98 (60%) of them hospitalized and two cases died giving CFR 0.6%. Predominant signs were vomiting 129 (79.1%), and abdominal pain 104 (63.8%). Median incubation period was 7 hours [IQR=6-9.5 hours]. Staph aureus was detected in 5/17 (29.4%) of tested patients’ clinical samples, in one throat swab from a food-handler and in two different food samples. Enterotoxins were detected in the cooked chicken. Univariate analysis implicated chicken, meat and rice with ORs: 8 (95%CI=3.9-16.4), 7.5(95%CI=3.6-15.8) and 2.9(95%CI=1.5-5.8) respectively. After stratification chicken and meat remained significant. Assessment of level of food handling and processing revealed improper food-holding temperatures and poor staff personal hygiene. No pathogenic microorganisms identified in drinking water source or swimming pool water.

Conclusion
A large outbreak of Staph Aureus food poisoning occurred among hotel guests in a non-touristic governorate near Cairo. Improper food-handling temperatures and poor staff personal hygiene contributed to the outbreak. Inspection and supervision of all hotels in touristic and non-touristic areas for compliance to food handling regulations is recommended to prevent such outbreaks.
Foodborne Disease Outbreak among students of Oshakati Senior Secondary School, Oshana region, Namibia - January, 2019

Tuesday, 29th October - 11:10: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 472

Ms. Roswitha Ndjengwa, Prof. Kofi Nyarko, Ms. Esther Mukete-Hilundutah, Ms. Padelia Ngenokesho

Background
On 29 January 2019, a cluster of students from Oshakati Secondary School, Namibia reported to the casualty department of Oshakati Hospital with a history of acute diarrhoea and abdominal cramps. We investigated to verify the outbreak, identify potential sources and implement control measures.

Methods
We conducted an unmatched 1:1 case-control study. We reviewed medical records and interviewed food handlers. Environmental assessment was conducted. We interviewed 89 cases and 89 controls using structured questionnaires to identify risk factors. A case was any student staying at Oshakati Secondary School hostel with a history of diarrhoea and abdominal cramps, with or without blood in stool, or vomiting from 28 to 29 January 2019. A control was any asymptomatic student from the same school from 28 to 29 January 2019. Stool and water samples were collected for laboratory testing. Descriptive and inferential statistical analysis were performed. We generated frequencies, proportions and odd ratios with 95% Confidence Intervals (CI). Statistical significance was determined at p-value of <0.05.

Results
We confirmed 89 cases, giving an attack rate of 7% (89/1033) with no deaths. Of these, females were 78 (88%). The mean age of cases was 17.24 (+/- 1.4 SD). Eating eggs and soft porridge was protective of becoming ill; (AOR 0.29, [95% CI 0.13 – 0.61], p-value 0.001) and (AOR 0.34, [95% CI 0.16 – 0.71], p-value 0.004) respectively. Soup was significantly associated with illness, (AOR 4.6, [95% CI 1.5 – 13.71], p-value 0.005). Giardia lamblia trophozoites and Blantadium.coli (B. coli) were isolated from stool and water samples respectively.

Conclusion
This foodborne outbreak at Oshakati Secondary School was caused by Giardia lamblia trophozoites and B. coli. Eating soup was significantly associated with illness. We recommended the Environmental division to routinely inspect the school kitchen and conduct analysis on municipal water. We educated food handlers on food safety and hand wash.
An Outbreak of staphylococcal enterotoxin A Linked to Funeral Banquet in Chengdu, China, 2018

Tuesday, 29th October - 11:30: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 340

Mrs. Huang Binbin, Mrs. Wenyan Liu, Mr. Ke Jiang, Mrs. Xiaoli Tuo, Mr. Liang Wang

Background
On 30 August 2018, a cluster of acute gastroenteritis were reported among guests of a three-day funeral banquet in Chengdu. An investigation was conducted to verify the cause of the outbreak and provide recommendations for prevention and control.

Methods
We defined a suspect case as onset of diarrhea (≥ 3/24 h) or vomiting (≥ 2/24h) after attending the funeral banquet during August 28 to 30. A confirmed case was a suspect case with staphylococcal enterotoxin in anal swab. We conducted face-to-face visits among the hosts, food handlers and guests, and searched hospital records to find cases. A case-control study among all suspect cases was conducted to identify risk factors for foodborne disease outbreak. Anal swabs of 8 cases and residual food were collected, sampled and tested.

Results
We identified 22 suspect cases and 7 confirmed cases at the banquet, all of which participated in the lunch on August 30. The attack rate was 18%(29/162). Cases had vomiting(93%), abdominal pain(76%), diarrhea(66%) and nausea(62%). Incubation periods ranged from 1 to 6.5 hours (median 3.5). We selected 29 cases and 24 guests without clinical manifestations. 22(76%) of 29 cases who ate spicy crab compared to 4(17%) of 24 persons who did not (OR=7.7; 95%CI=1.4-41.4), 24(83%) of 29 cases who ate roast duck compared to 7(30%) of 24 persons who did not (OR=5.4; 95%CI=3.0-28.2). Staphylococcal enterotoxin A was identified in anal swabs of 2 cases, spicy crab and roast duck. The two dishes have been left at room temperature more than 4 hours before eating.

Conclusion
The foodborne disease outbreak was caused by Staphylococcal enterotoxin A. Eaten spicy crab or roast duck was the main risk factor. We recommend that food handlers and the general public receive food safety education.

Tuesday, 29th October - 11:50: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 227

Dr. Hendrik Camphor, Dr. Ben Polkinghorne, Ms. Christina Bareja, Ms. Anna Glynn-Robinson

Background
Poliovirus circulation persists in some of the most underdeveloped and insecure regions of the globe. All polio–free countries remain at risk of polio recurrence until eradication is achieved. In 2014, the World Health Organization (WHO) declared the international spread of poliovirus a Public Health Emergency of International Concern. Under the International Health Regulations (2005), WHO Member States need to verify certification of polio–free status annually. In 2018, Australia sought to reassess and comprehensively characterise the risk posed by wild–type and vaccine–derived polioviruses to national health security. However formal international polio risk assessment guidelines do not exist.

Methods
A novel mixed–methods approach was developed to capture key components of likelihood and impact that influence poliovirus reintroduction, outbreak and sustained transmission risk. Four risk elements were identified and weighted using an expert–informed Delphi method: reintroduction hazard (poliovirus importation or laboratory containment failure), population immunity, surveillance quality and performance, and outbreak response capability. Australian data and qualitative evidence were analysed, documented and scored against risk element indicators to characterise polio risk as a semi–quantitative estimate and qualitative risk category.

Results
The semi–quantitative risk characterisation estimate calculated to a likelihood and impact score of 0.43 and 0.13, respectively (possible range: 0.02–4.5). The semi–quantitative results translated to a qualitative risk category statement of very low risk.

Conclusion
The assessment concluded that the risk of poliovirus reintroduction, resultant outbreaks of poliovirus infection, and sustained transmission occurring in Australia in the next five years is very low. Until poliovirus is eradicated, it remains in Australia's strategic health security interest to maintain appropriate investment in the prevention, preparedness, surveillance and response capability which underpins the very low level of risk. Use of a structured, transparent and reproducible methodology simplifies completion of future assessments, generates evidence for targeted investment, and provides a framework to support other countries to evaluate their poliovirus risk.
Risk Factors for Heat-Related Illness Among Workers — California, 2000–2017

Dr. Amy Heinzerling, Dr. Rebecca Laws, Dr. Matt Frederick, Dr. Rebecca Jackson, Dr. Gayle Windham, Dr. Barbara Materna, Dr. Robert Harrison

Background
As climate change raises global temperatures, studies have projected that heat-related morbidity and mortality will increase. Workers who perform exertional tasks or work in non-climate-controlled environments are particularly susceptible to heat-related illness (HRI). California is 1 of 3 states with an occupational standard to prevent HRI, requiring employers to provide employees with training and access to water, shade, and rest. We assessed occupational HRI patterns in California during 2000–2017 to identify workers at highest risk and guide prevention strategies.

Methods
We identified HRI claims in California’s Workers’ Compensation Information System (WCIS) during 2000–2017, using International Classification of Diseases Ninth and Tenth Revision codes, WCIS nature and cause of injury codes, and HRI keywords. We assigned census industry and occupation codes using NIOSH’s Industry and Occupation Computerized Coding System (NIOCCS). We calculated average annual HRI rates/100,000 workers during 2000–2017, by sex, age group, year, county, and industry and occupation, using employment denominator data from NIOSH’s Employed Labor Force and California’s Employment Development Department.

Results
We identified 15,996 cases of HRI during 2000–2017 (average 6.0 cases/100,000 workers/year). Among age groups, those aged 16–24 years had the highest HRI rate (7.6); men (8.1) had a higher rate than women (3.5). Geographically, rates were highest in southern California, including Imperial (36.6), San Diego (32.7), and Los Angeles (31.8) Counties. Occupational groups with the highest HRI rates were protective service (56.6), farming, fishing, and forestry (36.6), and material moving occupations (12.3). Among individual occupations, firefighters had the highest rate (389.6).

Conclusion
Young workers, male workers, workers in southern California, and workers in firefighting, agriculture, and material moving occupations are particularly susceptible to occupational HRI in California. Collaboration with these workers and their employers to develop prevention strategies, such as education and training, may help reduce HRI in the workplace.
FETP Alumni Oral Presentation Session (sponsored by TEPHICConnect);
Moderators: Henry ”Kip” Baggett, Carl Reddy;
Tuesday, 29 October 2019, 3:30pm; Venue: Willow
Epidemiology, Risk Factors and Clinical presentation of Neonatal Tetanus (NNT) cases admitted at Sifat Ghayur Shaheed Memorial Infectious Diseases Children (SGSMIDC) Hospital, Peshawar, Khyber Pakhtunkhwa (KP) Province, Pakistan January - April 2019

Dr. Syed Wasif Javed, Dr. Natasha Sumbal

Background
Neonatal Tetanus (NNT) remained a leading cause of neonatal mortality in Pakistan. Low vaccination and antenatal coverage, unhygienic deliveries and umbilical cord care practices contribute to NNT. Pakistan failed to achieve the NNT elimination target by 2015. The purpose of the study was to analyze NNT related data to provide magnitude and baseline information for evidence-based intervention.

Methods
A single centered retrospective descriptive study was conducted in May 2019. A case was defined as "Any neonate with normal ability to suck and cry during the first 2 days of life and who, between 3 and 28 days of age, developed neck stiffness, locked jaw, inability to suck, fits with or without fever, irritability, and drowsiness. Hospital records of all cases consistent with case definition from 1st January to 30th April 2019 were reviewed. The pre-tested questionnaire used to collect demographic, clinical and risk factor information.

Results
A total of 178 cases were identified with a mean age of 8 days (SD ± 4.8, range 2 - 24). Male to female ratio was 4:1. Rural districts shared the highest disease burden of 152 (85%) of the total cases. Mean days from birth to onset was 7 days (range 1 - 18). Frequent symptoms were fits 129 (72%), inability to suck 121 (68%), fever 111 (62%), locked jaw 80 (45%) and neck stiffness 62 (34%). The case fatality rate was 63% (112/178). Mean days from onset to fatality was 6 days (range1-17). The proportion of mothers with zero Tetanus Toxoid (TT) vaccination was 177 (99%) and zero antenatal visits were 164 (92%). Deliveries conducted by untrained birth attendants were 133 (75%) with 141 (79%) home deliveries. Frequent umbilical cord cutting instrument was fruit knife 76 (43%) and shaving blades 74 (41%). The frequency of cord clamping material was thread 111 (63%), cord clamp 34 (19%) and cloth 33 (18%). Herbal remedies like turmeric powder, cooking oil and Surma (kohl) applied to 149 (84%) cord stumps.

Conclusion
The study will provide evidence to policymakers for effective and efficient NNT prevention by focusing on surveillance, immunization of women and provision of clean deliveries.
Investigating the health effects of loose-fill asbestos insulation in the Australian Capital Territory, Australia.

Prof. Martyn Kirk, Prof. Rosemary Korda, Prof. Bruce Armstrong, Prof. Cathy Banwell, Mrs. Susan Trevenar, Ms. Hsei-Di Law, Prof. Mark Clements

Background
Asbestos causes mesothelioma and other cancers, although the health effects of residential exposure are less clear. We investigated the health effects of living in ~1100 houses insulated with loose-fill amosite asbestos in the 1970’s that were subsequently remediated in the 1980’s in the Australian Capital Territory (ACT), Australia.

Methods
We conducted four sub-studies: (1) a descriptive analysis of mesothelioma cases in the ACT, (2) focus groups of residents, (3) a cross-sectional survey of recent residents, and (4) a population-based cohort study examining a range of cancer outcomes. The cohort study linked all ACT addresses since 1984 to national cancer and death datasets to estimate incidence among those who had ever or never lived in these houses. Analyses were conducted using Stata and studies were approved by relevant ethics committees.

Results
In descriptive analysis, (81%) of reported mesothelioma cases in the ACT were male and the rate between 2009-11 was 2.95 per 100,000 persons; similar to the rest of Australia. Living in affected homes resulted in high levels of stress with many residents experiencing loss of neighbourhood. Among surveyed residents, 53% (193/363) reported asbestos fibres were found in household living areas and 81% (119/140) of men entered roof spaces. In the cohort study of >1million individuals, the rate of mesothelioma among male residents was 2.54 (95%CI 1.02-5.24) times higher than among men who never lived in affected homes. There were no cases of mesothelioma among female residents. Standardized incidence ratios were elevated for some other cancers among residents.

Conclusion
This was an unusual exposure to asbestos in the Australian domestic setting, although this type of insulation may be widespread in other countries. Residential exposure to asbestos may be harmful and result in considerable community distress. Our findings provide support to government efforts to eliminate exposure. We recommend people avoid all exposure to asbestos-containing insulation.
Health versus Other sectors: Resource Allocation Preferences in Uganda

Background
Limited health sector spending and investment is a perennial challenge in Africa. Most health services are geographically specific and so a central policy issue in many countries is how national (often tax-based) funds should be allocated to localities. Rather than relying on arbitrary methods of solving this “resource allocation” problem, such as historical precedent or political patronage, many health systems are seeking to place greater emphasis on the use of systematic funding formulae.
This study elicited Ugandan citizens’ preferences for resource allocation across all sectors using a best-worst scaling (BWS) survey and examined how their stated preferences compared with actual government expenditures.

Methods
This was a cross sectional descriptive study with quantitative data collection techniques. Data in this study was collected using a BWS survey to elicit respondents’ preferences through face to face interviews with heads of households in 432 households from both rural and urban areas of Mukono district in central Uganda. We elicited citizens’ preferences for resource allocation across all sectors using a best-worst scaling (BWS) survey. The BWS survey consisted of 16 sectors corresponding to the Uganda national budget line items. Respondents chose from a subset of four sectors in 16 choice tasks, which sectors they thought were most and least important to allocate resources to. We utilized the relative best-minus-worst score method and a conditional logistic regression to obtain ranked preferences for resource allocation across sectors. We then compared the respondents’ preferences with actual government budget allocations.

Results
Ugandan citizens’ preferences for resource allocation showed that overall the health sector was the top ranked sector based on citizens’ preferences, but was ranked sixth in national budget allocation, encompassing 6.4% of the total budget. Water and environment were also largely underfunded, ranked second in citizens’ preferences for resource allocation but tenth (4.6%) in actual budget allocation. Works and transport were over-funded, ranked sixth by citizens’ preferences but ranked first (22.1%) in budget allocation.

Conclusion
Policy makers in Uganda should take citizens’ preferences into consideration when discussing resource allocation and meet their calls to create more fiscal space for the health sector. Greater investment in health would satisfy citizens’ preferences and needs based on their choice.
Emergence of Crimean-Congo Haemorrhagic Fever in Uganda: Evidence from a country-wide Seroepidemiological study in Cattle.

Dr. Luke Nyakarahuka, Mr. Stephen Balinandi, Mr. Jackson Kyondo, Ms. Sophia Mulei, Mr. Alex Tumusiime, Dr. John Klena, Dr. Julius Lutwama, Mr. Trevor Shoemaker

Background
Uganda had not reported outbreaks of Crimean-Congo Haemorrhagic Fever (CCHF) in humans until 2013 when human cases of CCHF were detected in Northern Uganda district of Agago. Subsequent outbreaks of CCHF human cases have been confirmed in several districts of Uganda, especially from the cattle corridor. The Viral Haemorrhagic Fever Surveillance (VHFS) program of the Uganda Virus Research Institute (UVRI) designed a nationwide study to establish seroprevalence of CCHF virus in livestock as a possible source of infection to humans.

Methods
Blood samples and relevant data were collected from 1746 cattle, 1107 goats and 364 sheep in 27 districts across all regions of Uganda as part of a CCHF longitudinal study, beginning in February 2017. Only data from cattle are presented in this abstract. At-risk herds were sampled purposively distributed all over the Uganda and blood samples tested using a US CDC in-house ELISA targeting IgG antibodies against CCHF virus. This ELISA has sensitivity and specificity of more than 90%. Data were analysed using binary logistic regression for risk factors of CCHF seropositivity.

Results
The overall seroprevalence in cattle was 17.4% (303/1746) whereas herd prevalence was at 60% (72/121). Female adult cattle were more at risk of being seropositive at 20% (224/1128), OR=2.6, 95% CI=1.7-4.1). Risk factors identified include tethering and paddocking production systems (OR=2.3, 1.2-4.2), an animal with a history of stillbirths (OR=1.7, 1.1-2.8) and being a local breed (OR=18.4, 2.5-132.9). The prevalence was higher in northern Uganda (OR=3.1,2.5-4.5) and cattle corridor districts (OR=1.6, 1.3-2.1) whereas animals from border districts were less likely to be seropositive (OR=0.5, 0.2-0.6).

Conclusion
CCHF is emerging in Uganda, spreading from Northern districts of the country and establishing in the cattle corridor of Uganda. Further studies and prospective analysis should be completed in order to determine the risk factors for the emergence and transmission dynamics.
Prevalence and Risk Factors for Multi-Drug Resistant Escherichia coli among Poultry Workers – Abuja, Nigeria, 2019

Tuesday, 29th October - 16:50: FETP Alumni Oral Presentation Session (sponsored by TEPHIConnect) (Willow) - Waitlisted - Oral - Abstract ID: 276

**Dr. Mabel Aworh, Prof. Jacob Kwaga, Mrs. Nwando Mba, Prof. Emmanuel Okolocha, Siddharta Thakur**

**Background**
Antimicrobial resistance has emerged as a global health threat. Drug resistant *Escherichia coli* infections are associated with high morbidity and high expenditure on antibiotics compared with infections by susceptible strains. In Nigeria, antimicrobial drugs are readily available over-the-counter with potential for indiscriminate use by poultry farmers and eventual development of drug resistance. We investigated prevalence and risk factors for multi-drug resistant *Escherichia coli* among poultry-workers (PW) in Abuja, Nigeria.

**Methods**
We conducted a cross-sectional study among 122 randomly selected apparently-healthy PW (farm-workers/poultry-sellers) in Abuja Municipal and Kuje Area Councils, Nigeria from December 2018 to April 2019. We collected data on socio-demographics and exposure-factors using structured interviewer-administered questionnaire. Stool samples were collected from PW to investigate the presence of *Escherichia coli*. Antibiotic susceptibility testing was performed using Kirby-Bauer disk diffusion method. We defined multi-drug resistance (MDR) as resistance to three or more classes of antibiotics used for treating poultry diseases. We computed prevalence odds-ratio (POR) at 95% confidence intervals (CI). Risk factors were identified using unconditional logistic regression.

**Results**
Mean age of PW was 30.7 ± 9.7 years. Majority were males: 121 (99.2%), married: 67 (54.9%), had secondary education: 71 (58.2%) and farm-workers: 76 (62.3%). Prevalence of *Escherichia coli* was 39.3% (n=48), highest among farm-workers compared to poultry-sellers (POR=2.7, 95% CI =1.3 – 5.9). Of 48 isolates, 38 (79.2%) were multi-drug resistant; resistant to Tetracycline: (83.3%, n=40), Sulfamethoxazole-Trimethoprim: (79.2%, n=38), Ampicillin: (77.1%, n=37), Streptomycin: (72.9%, n=35). Absence of lavatory (POR =2.7, 95% CI =1.1-6.7); existence of farm/market for >10years (POR=2.5, 95% CI=1.1-5.4) and PW's history of diarrhea in last three months (POR=2.8, CI=1.2-6.3) were associated with MDR. Controlling for age, absence of lavatory (adjusted Odds Ratio [aOR]=4.3, 95% CI=1.6-11.9); occupational exposure >10 years (aOR=0.3, 95% CI=0.1-0.9) and PW's history of diarrhea in last three months (aOR=3.3, CI=1.3-8.5) were independent risk factors for MDR.

**Conclusion**
Prevalence of multi-drug resistant *Escherichia coli* was highest among farm-workers. Risk factors for MDR were occupational exposure and poor hygienic measures. We recommended that Area Councils should provide lavatories for public use in farm-settlements/markets. We sensitized affected farms/markets on responsible use of antibiotics in poultry-production and importance of hand-hygiene.
Unprecedented Upsurge of Lassa fever cases in Nigeria, January to March 2018: a glimpse of hope

Background
Lassa fever is an acute viral hemorrhagic fever (VHF) endemic in Nigeria. The 2018 massive wave of confirmed cases of Lassa fever in Nigeria raised the important question, whether the “outbreak” was due to a new virus variant, improved case detection/diagnosis or a combination of these factors. We therefore described the likely causes of the 2018 upsurge of Lassa fever cases in Nigeria.

Methods
The national Lassa fever 2017 and 2018 data was extracted from the VHF case-investigation-form database and analysed. Genomic sequencing was carried out on positive Lassa fever samples. Key informant interviews were conducted for national Lassa fever multisectoral multipartner Emergency Operation Centre (EOC) leads and stakeholders. One-health approach was used to ensure implementation of human, animal and environmental interventions.

Results
A total of 394 confirmed cases were recorded in the first 12 weeks of 2018 compared to 107 reported in the same period in 2017. The case-fatality-rate decline from 44% in 2017 to 26% in 2018. Majority (81%) of all confirmed cases were reported from three historical hotspot states. Age-group 21-40(44%) were mostly affected with a male to female ratio of 2:1. Results from viral sequencing yielded no indication of new circulating viruses. Phylogeny points to multiple zoonotic infections not extended person-to-person transmission. Key informant interview results revealed improved case detection, increased diagnosis, heightened awareness due to increased risk communication activities and enhanced one health response coordination by Nigeria Centre for Disease Control (NCDC).

Conclusion
The 2018 upsurge of Lassa fever cases in Nigeria was certainly multifactorial, however, not due to new virus strain. A coordinated one health EOC response approach ensured robust reporting of case and less severe outcome of disease giving a glimpse of hope in the outbreak control. We therefore recommended to NCDC to conduct Lassa fever modelling and research to identify the possible role of increased rodent population and ecological factors in the large outbreak.
Poster Session; Tuesday, 29 October 2019, 3:30pm; Venue: Stone Mountain Ballroom
Cholera Outbreak in Sinapangan Village, Libungan, North Cotabato, Philippines, July 17-20, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 220

Dr. Eugenia Mercedes Cañal, Dr. Ma. Ivy Rozeth Saavedra-Iturralde, Dr. Alethea De Guzman, Dr. Ma. Nemía Sucaldito, Dr. Ferchito Avelino

Background
On July 2018, we received a report on increasing diarrhea cases in Sinapangan Village, Libungan, North Cotabato. An FETP team was sent to determine existence of an outbreak, source and mode of transmission, risk factors and recommend control and preventive measures.

Methods
We did an unmatched 1:3 case-control study. A suspect cholera case was a previously well individual in Sinapangan Village, Libungan with diarrhea from June 1–July 19, 2018. A confirmed cholera case was a suspect case positive for *Vibrio cholerae*. A control is any well individual negative for any pathogen within the same area and time period. We conducted key informant interviews and environmental survey of water sources. We sent rectal swabs and water samples for bacteriologic testing.

Results
Ninety cases were identified. One died (Case Fatality Rate: 1%). Forty-nine (54%) were males. Age ranged from three months to 74 years (Median=27). There was heavy rainfall which resulted to flooding at end of May. Cases appeared two weeks later; peaked on 1st week of July. Spring water sources are unprotected. Water sources were not regularly tested and chlorinated. Water pipelines are leaking and in close proximity to pit privies and disposed animal and human wastes. Three (13%) of 23 rectal swabs were positive for *Vibrio cholerae* Ogawa biotype El Tor. Risk factor was sharing of toilet (OR=2.46, 95% CI=1.31-4.61). Protective factors were boiling drinking water (OR=0.31, CI=0.17-0.56) and using spoon and fork when eating (OR=0.34, CI=0.17-0.67).

Conclusion
There was a cholera outbreak in Sinapangan Village. Water sources became contaminated with fecal matter due to flooding. Neither were there measures to immediately disinfect the system at the source or at the household level. Household chlorination of drinking water was immediately done. We also recommended the rehabilitation of water system and improvement of sanitation by provision of sanitary toilets and proper garbage collection.
Surveillance data Analysis of Suspected cases of Shigellosis- Burkina Faso, 2010 - 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 355

Dr. Sonia Ilboudo, Dr. Yameogo Issaka, Dr. Bicaba Brice Wilfrid, Dr. Sawadogo Bernard, Dr. Yanogo K. Pauline, Mrs. Fadima Diallo R.M., Dr. Joseph Otshudiandjeka, Prof. Meda Nicolas, Dr. Marianne Laurent

Background
Shigellosis is the leading cause of bloody diarrhea in the world. An estimated 165 million people worldwide are affected each year and 99% of them occurs in low-income countries. Children under 5 are the most affected age group with 500,000 to 1 million deaths per year. In Burkina Faso, surveillance of shigellosis is done through the surveillance of patients having bloody diarrhea; it started since 1996. The data exists but is poorly analyzed. The objective of our study was to describe Burkina Faso suspected shigellosis cases from 2010 to 2018 by time, place and person.

Methods
We conducted a descriptive cross-sectional study on shigellosis secondary surveillance data in Burkina Faso from January 1st 2010 to December 31st 2018. The population and the study sample were respectively, Burkina Faso population distributed in the 13 regions and the suspected cases of shigellosis recorded in two national databases. The study consisted of a literature review of these shigellosis databases. We described suspected cases of shigellosis according to time, place and person criteria and determined outbreaks periods by the CUSUM (C2) method. Analysis was performed with Excel 2016, Epi info 7.2 and Health Mapper 4.2 software.

Results
A total of 23,638 suspected cases of shigellosis and 27 deaths were recorded, with a lethality of 0.11%. The median age of cases was 21 years (range: 0-94 years). Adults over 30 and children under 5 were more affected. The annual incidence decreased from 2010 (62 patients / 100,000 p-y) to 2018 (1 patient / 100,000 p-y). The four regions which recorded the most cases were the North with 4999 (21.15%), Upper Basins 4011 (16.97%), Cascades 3117 (13.19%) and South Central 3037 (12.85%) respectively. We observed that many cases appeared in August and September every year. There was no laboratory result.

Conclusion
This analysis showed that suspected cases of shigellosis were mostly in four regions of Burkina Faso. The study also detected periods of outbreaks and found that no suspected cases were confirmed in the laboratory. We recommend the introduction of sentinel surveillance that will include the biological diagnosis and the determination of an epidemic threshold of shigellosis in Burkina Faso.
Establishment of Enhanced Diarrhea Surveillance in Hospitals After an Armed Conflict in Marawi City, Philippines, June 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 228

Ms. Mariz Zheila Blanco, Mr. Jasper Kent Ola, Mr. Alireza Faiyaz, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Background
On May 23, 2017, a firefight ensued between government forces and an armed group in Marawi City resulting to mass evacuation of people to Iligan City. On June 2, 2017, a Field Epidemiology Training Program team was sent to Iligan City to establish enhanced diarrhea surveillance in hospitals, identify clustering of diarrhea in evacuation centers and villages, and recommend control and prevention measures.

Methods
We selected all hospitals in Iligan City. Eight hospitals were identified. We developed a reporting flow and recording tool. A suspect case was an Internally Displaced Person (IDP) with ≥3 episodes of loose watery stool per day from May 23, 2017 who consulted in a hospital in Iligan City. A confirmed case was suspect case positive for any bacteriological pathogen. Clustering was defined as ≥3 suspect cases in evacuation centers or home-based village in four consecutive weeks. We collected rectal swabs for bacteriologic testing.

Results
There were 253 diarrhea cases from May 23-July 31, 2017. None died. Eighty (32%) were aged 1-4 years. Cases stayed in evacuation centers (EC) or houses of relatives. Twelve (5%) were positive for Vibrio cholerae. Six (50%) resided in the community; five (42%) were at ECs. One specimen has no data. Clustering were seen in a village and one evacuation center. Data led to regular water screening and disinfection activities and provision of additional communal toilets at the evacuation centers. No diarrhea outbreak was detected.

Conclusion
There were clustering of diarrhea cases among IDPs from Marawi City. Confirmed cases of cholera were staying in different evacuation centers and villages in Iligan City. However, due to immediate implementation of control and prevention measures, no outbreak occurred. Disasters and conflicts threaten public health. Surveillance is a fundamental part of public health practice to detect, control, and prevent the impact of disease, guide immediate and long-term actions, and prioritize the use of public health resources.
A norovirus gastroenteritis outbreak in high school caused by contaminated barrelled water in Guangdong, China

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 308

Ms. Yingyu Lin, Ms. Shuping Gao, Mr. Hai Wang, Ms. Yifang Long, Ms. Siyuan Pan, Mr. Meng Zhang

Background
On 20th February, 2019, a total of 32 cases were reported of gastroenteritis by a school. An epidemiology investigation was conducted to determine the source, identify the risk factors, and propose control measures and preventive recommendations.

Methods
The probable cases was defined as all teachers, students and related staffs in the school with the symptoms of diarrhea (≥three times/day accompanied by variation in stool properties) or vomiting from 12th to 22th February, 2019. A confirmed norovirus case was a probable case and norovirus positive from a rectal swab RT-PCR. Cases were searched by reviewing the school’s records and medical records and interviewing health teachers, and controls were selected for asymptomatic one. We selected 49 cases and 56 controls, matched by class and sexy. A case-control study was used to explore the risk factors in drinking barrelled water, dealing with vomit and eating in or out of school. Anal swabs from patients, cleaners in school and kitchen workers, as well as water samples were collected for the detection of norovirus nucleic acid. Besides, waterworks were inspected.

Results
A total of 51 cases were identified, including 40 probable cases and 11 confirmed cases. Besides, 1 asymptomatic cleaner who worked in school. The clinical manifestations were vomiting (66.7%) and diarrhea (60.8%). The cases were clustered in Grade three and dormitory. The incidence rate of male was 17.22% and female was 15.04%. The case-control study demonstrated that drinking barrelled water was a risk factor (OR=5.3, 95%CI: 2.3-12.6). The further investigation on the production process of barrelled water showed that the main risk factors were the source water was easy to be polluted, the disinfection equipment usually had problems and the disinfectant dosage of washing the barrels was unstable. A total of 12 anal swabs from patients and cleaning worker in school, 3 water samples from infected classes’ barrelled water, unopened barrelled water and the finished water were positive for norovirus.

Conclusion
This outbreak was caused by barrelled water contaminated by norovirus. It is recommended that the Market Supervision Administration strengthen monitoring, conduct regular sample inspections and supervision in barrelled water enterprises to ensure drinking water safety.
Outbreak Investigation of Food Poisoning Attributed to Omphalotus japonicus in a restaurant in Jianhe County, Guizhou, China, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 325

Ms. Jing Chen, Mr. Tao Shen, Mr. Yanping Zhang

Background
On April 8th, 2018, 11 residents presented with nausea and vomiting to a local hospital, all had consumed wild mushrooms in hotpot during a dinner several hours before in the same restaurant in Jianhe County, Guizhou Province. We conducted an investigation to identify the cause, risk factors, and provide prevention and control measures.

Methods
A case was defined as any person with two of following symptoms: vomiting, nausea, dizziness and abdominal pain among those who had a dinner in the same restaurant on April 7th. We collected information by reviewing the outpatient logs and inpatient medical records and interviewed restaurant owners, waiters and diners. A retrospective cohort study was conducted to identify the suspicious dishes. Samples of the remaining wild mushroom were collected for morphological classification.

Results
A total of 11 cases were identified, with an attack rate of 61% (11/18). The main symptoms were vomiting (91%) and nausea (36%). The median frequency of vomiting was 4 times. The median duration of disease was 33 hours. The median incubation period was 4 hours. The attack rate of eaten wild mushroom in hot pot was 73%, comparing with those who did not eat hot pot was 0% (Fisher’s exact, P < 0.05). The more food consumption, the shorter incubation period (r=-0.635, P < 0.05), the longer duration of disease (r = 0.664, P < 0.05). The remaining samples of wild mushroom were classified as Omphalotus japonicus by morphology. It was easy to cause food poisoning by mistaking this kind of mushroom for safe mushroom.

Conclusion
This outbreak was caused by Omphalotus japonicus mushroom served at a local restaurant. We recommended distributing public health safety information about wild mushroom poisoning in mountainous rural areas, and ask restaurants and other catering units not to provide unfamiliar wild mushroom dishes.
Food Poisoning in Office X, Sleman District, DIY Province, Indonesia - 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 202

Ms. Wafiyyah Rizki Wiariyanti, Ms. Rilla Venia Lalu, Mr. Trisno Agung Wibowo, Mrs. Elisabet Cucuk Prasetyaningsih

Background
On May 9th, 2018, Public Health Center received report of suspected food-poisoning in office X after a training on May 8, 2018. We did an investigation to confirm the outbreak and identify its risk factors to provide recommendations for stakeholders as prevention.

Methods
1:1 case-control study design and questionnaire were used in case-finding. Case definition are people experienced one or more symptoms of nausea/diarrhea/vomiting/bloating with or without other symptoms such as dizziness/headache/fever after having coffee-break meals in Office X training on May 8, 2018. Control are people who did not experience symptoms of illness after eating coffee-break meals in Office X training on May 8, 2018. We calculated OR and 95% CI to determine type of food with highest risk. Environmental investigations were carried out by visiting two food-handlers and conducting laboratory test on food samples as microbiological investigations.

Results
Out of 91 populations at risk, 46 people (51%) were ill. Cases were dominated by women (58%) and age-group of 21-30 years (70%). Most experienced symptoms were nausea (85%) and diarrhea (65%). The incubation period was 2-44 hours with average of 23 hours. Statistical tests showed that tofu meatballs is related to food poisoning (OR=8; 95% CI=0.4-3.2). The bacteria which allegedly caused the poisoning was Bacillus cereus. The food kept at room temperature for >2 hours, even though, microbiological examination did not show it because of the samples were taken from only one food-handler.

Conclusion
There was a case of food-poisoning in Office X on May 8, 2018 due to consuming tofu meatballs likely contaminated by Bacillus cereus. We recommended to conduct counseling on clean and healthy living behavior to risk populations in the working area. It is expected that the caterer will continue to improve the cleanliness and supervise the provision of food.
Food Borne Outbreak among Sanitary Supervisors during World’s Largest Religious Mass Gathering, Prayagraj, Uttar Pradesh, India-2019

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 525

**Dr. Abhishek Mishra, Dr. Vaisakh T P, Dr. Binoy Babu, Dr. Tanzin Dikid, Dr. Amol Patil, Dr. S K Jain, Dr. Kiran Kumar Maramraj, Dr. Sushma Choudhary, Dr. Yash Agarwal, Dr. Sujeet Singh**

**Background**

Religious mass gathering held at Prayagraj, India in 2019 attracted approximately 150 million pilgrims globally. Daily disease surveillance was established by state health authority and National Centre for Disease Control, Delhi with objective to identify early warning signals for outbreak prone diseases. On February 19, acute diarrhoeal cases were reported from sanitary supervisor's residence (camp A). An investigation was conducted to describe outbreak, determine risk factors and provide evidence based recommendations.

**Methods**

We defined case as acute onset of ≥3 loose stools within 24 hours or pain abdomen or vomiting from February 18-20, 2019 in a person residing at camp A. We conducted active case search and reviewed hospital records to collect information on symptoms, date of illness onset, and treatment history. Unmatched 1:2 case control study was conducted to identify associated risk factors. Healthy controls were selected from the same camp A. Due to limited laboratory support only one stool sample was collected and tested for *Vibrio Cholera*. We interviewed the food handlers about recent illness and preparation of implicated food items. Frequency, OR with 95% CI were calculated using Epi-Info.

**Results**

We identified 16 cases (25% females) with median age 25 years (range 21-38 years). Overall attack rate was 7.6%(16/210). Most common symptom was pain abdomen (81%) followed by diarrhoea (44%). Eight cases (50%) were hospitalized with no death. Median incubation period was 26 hours (range 18-32 hours). Upma (thick semolina porridge) served as breakfast on February 18, was associated with illness (OR=5.57, 95%CI=1.32-23.4). Food handler didn’t report any gastrointestinal symptoms during the month prior to the outbreak. Overnight, non-refrigerated leftover boiled potatoes were used in upma preparation. Stool sample was negative for *Vibrio cholera*. Food leftover was not available for testing. Food Safety and Standards Authority of India (FSSAI) guidelines were not followed for food preparation and storage.

**Conclusion**

Point source outbreak of acute gastroenteritis occurred at camp A associated with consumption of upma with leftover boiled potatoes. The epidemiological, clinical, and environmental findings indicate the most likely etiologic agent to be *Bacillus cereus*. We recommend to follow FSSAI guidelines and strengthen laboratory capacity during mass gatherings.
An Outbreak of Norovirus at a Middle School - Guangdong Province, China, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 330

Ms. Jia Peng, Mr. Jianguo Feng, Ms. Huizhen Zheng, Mr. Meng Zhang, Ms. Junling Sun, Dr. Huihui Liu

Background
On 11 October 2018, a number of students who developed vomiting and diarrhea was reported in a middle school in township in Guangdong province. There were 296 boarding students and 570 non-boarding students in school. An investigation was conducted to identify the cause of disease and risk factors, and propose control measures and preventive recommendations.

Methods
A suspected case was defined as a student or staff who vomited 1x or more or had diarrhea 3x or more in 24 hours during October 6-16. A confirmed case was a suspected case and norovirus positive from a rectal swab RT-PCR and an asymptomatic carrier with RT-PCR (+) but no clinical symptoms. We surveyed water sources and foods in school. We selected 36 cases and 36 controls, matched by class and compared their exposures to foods, water and contact.

Results
We identified 39 cases (7 confirmed as norovirus GII) and 1 asymptomatic carrier who was a kitchen worker. 35 cases were boarding students, 1 case was non-boarding student and 3 cases were intern teachers who lived in the student dorm. The kitchen worker also lived in student dorm. The outbreak peaked at 48 hours after the first case occurred. The vomitus was thrown to dustbin in third floor in dorm by first case. The incidence rate of boarding students (12%) was significantly higher than that in non-boarding students (0.18%). And the incidence rate of those who walked through third floor (20%) was significantly higher than those who didn't (8.2%). The case-control study showed that, exposure to vomitus was a risk factor (OR=5.67, 95%CI: 1.13-28.44) and using hand sanitizer or soap was a protect factor (OR=0.09, 95%CI: 0.03-0.29).

Conclusion
This norovirus outbreak was the most possibly caused by exposure to vomitus from the patients. The high-risk exposed site was the dorm. We recommend strengthen morning check and isolated vomiting patients and disinfect the vomitus in school.
Norovirus Gastroenteritis Outbreak Secondary to Pollution of Water Supply at a University: Jiangsu, China, 2019

Mr. Yang Han, Ms. Zhaorui Chang, Dr. Huihui Liu, Dr. Rongqiang Zu

Background
From March 19th - 26th, 2019, a university in Jiangsu reported many vomiting and diarrhea cases. To identify the number of cases, find the transmission mode and risk factors, an investigation was conducted.

Methods
A probable case was defined as any person in the university with following symptoms: vomiting (≥2 times/24h) or diarrhea (≥3 times/24h) from March 16th -29th. A confirmed case was defined as a probable case with norovirus positive stool or anal swab specimen by PCR. Cases search was conducted by using a cellphone survey software. A case control study was conducted to identify the risk factors for transmission. The data were analyzed by SPSS18.0 software, and the counting data were analyzed by Chi-square test. Statistical significance was determined at p < 0.05.

Results
We identified 1022 probable cases and 64 confirmed cases. The main symptoms included diarrhea (91%), nausea (68%), vomiting (62%). Norovirus was detected in the domestic sewage, 64 students or cooks' stool or anal swab specimens. Although the secondary water supply pool has been sterilized, there is still one terminal water sample that total coliform group and E.coli exceed the standard. The percentage of cases “eating in canteen from 19th supper to 20th lunch” was 91%, compared to 71% among control group (OR=4.3, 95% CI = 3.4-5.3), the percentage of “roommates vomiting or diarrhea in dormitory” among cases was 77%, compares to 20% among control group (OR=13.1, 95% CI = 11.1-15.5); the percentage of “handling others' vomit” among cases was 5%, compared to 3% among control group (OR=1.8, 95% CI = 1.3-2.5).

Conclusion
Secondary water supply polluted by norovirus was the primary cause of the outbreak, foodborne and human-to-human transmission may play an important role. Over 600 norovirus gastroenteritis outbreaks were reported in China during 2014-2017, of which 3.4% were waterborne outbreaks in school. We recommended strengthening guidelines and enforcement secondary water supply disinfection and monitoring in school. Disinfection of vomit should be timely and standardized so as to avoid exposure to students.
Factors associated with practices towards diarrhoea prevention among caretakers of children under five years in Lwengo District, Uganda

Background
Diarrhoea remains the second leading cause of death among children under five years (U5s) globally and is of the same importance in Uganda. In 2017, Lwengo district in Uganda had a high turn up of patients seeking treatments for water borne diseases and of which over seventy percent were children U5. This study investigated the factors associated with practices towards diarrhoea prevention among caretakers of children U5 in Lwengo.

Methods
In April-May 2018, a community based cross sectional study was conducted. The study was among 458 caretakers of children U5. Multistage sampling was used to identify caretakers and a structured questionnaire was administered to them at household level. Knowledge was measured on a composite score of WHO recommended knowledge elements on prevention and management of diarrhoea. Practices towards diarrhoea prevention were measured by a combination of self-reports and observation of eight element about water, sanitation and hygiene issues. Data was entered and analysed in SPSS version 13.0.

Results
Of the 458 caretakers, the mean ages of caretakers was 31.25 years (SD = 9.00) and 82.75% had formal education. Prevalence of diarrhoea in the U5s 14 days preceding the study was 52.4%. Among the caretakers. Two hundred seventy nine of the caretakers (60.92%; 279/458) had good knowledge about diarrhoea prevention; 55.9%(256/458) had good attitudes towards prevention of diarrhoea and 18.12% (83/458) had good practice towards diarrhoea prevention. Factors independently associated with good practices towards diarrhoea prevention were a caretaker being knowledgeable about diarrhoea prevention (Adj. OR=1.85, 95% CI=1.18-2.92); a caretaker having positive attitudes towards diarrhoea prevention (Adj. OR=1.26, 95% CI=0.87-1.83), and a caretaker being in the second wealth quantile (Adj. OR=1.78, 95% CI=1.07-2.96).

Conclusion
Practices towards diarrhoea prevention were associated with knowledge, attitudes, wealth index, hygiene and sanitation practices. Appropriate behavioral change interventions could lead to changes in caretakers’ practices on diarrhoea prevention in children.
Foodborne Outbreaks During Trauma Healing Program for Earthquake Victims in Mapin Rea Village, West Sumbawa Regency, Indonesia 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 188

Mr. Debri Rizki Faisal, Dr. Syahrizal Syarif, Mr. Rusli Rusli

Background
On September 9th 2018, at 3:30 p.m The police wives association (Bhayangkari) held trauma healing program for children victims of earthquake in Mapin Rea village. 130 packages of rice box and snack were also distributed. At 8:00 p.m 117 refugees experienced vomiting and stomachache, treated to Alas Barat Health Center. The investigation was conducted to describe and determine risk factors for foodborne poisoning.

Methods
Investigation was conducted by interviewing all people who participated in trauma healing program using a structured questionnaire. A retrospective cohort study was done in order to estimate risk factors associated to the outbreak. The case was a person who participated in the trauma healing program on September 9th, 2018 consumed rice box or snacks then experienced vomiting and diarrhea or more symptoms. Biological and food specimens were collected to laboratory examination.

Results
From 218 interviewed who consumed rice box or snack, as many as 150 cases (68%). Based on gender the cases in female (52%) and male (48%). The most cases were children with attack rate 79%. The predominant symptoms were vomiting (75%), stomachache (73%), nausea (73%) and diarrhea (4%). The epidemic curve shows a common source type with period of incubation 30 minutes - 9 hours (median 3 hours). As results, chicken’s meat suspected of causing food poisoning with RR = 3.11 (95%CI=2.00-4.82). Laboratory results found E.coli in food and biological samples. Information about the cooking process and packaging of food was not obtained due to Bhayangkari refused to be interviewed.

Conclusion
Outbreaks of food poisoning in trauma healing program held by Bhayangkari for earthquake victims in the Mapin Rea village due to food contaminated by E. coli. The staff health center should conduct surveillance and socialize about food sanitation and personal hygiene in refugee shelters.

Background
Between January 2018–April 2018, Busia County reported two confirmed cholera cases and six deaths as of 17th April 2018. We aimed to identify more cases, risk factors and evaluate preparedness and response during the outbreak.

Methods
We conducted active case search, case-control study and a preparedness and response evaluation. Cases were defined as ≥2 watery diarrhea episodes in person's ≥ 2 years old residing in Busia-county between January 2018–April 2018. Controls were defined as absence of watery diarrhea in any person of the same age group in same period. Cases were selected by simple random sampling from outbreak line-list. Controls were selected from the villages the cases resided using systematic random sampling, matched to cases by age ±2 years at a ratio 1:1. Socio-demographic characteristics, clinical, risk factors were collected using a structured questionnaire. Five health officials were interviewed to evaluate preparedness and response. Strengths and weaknesses in the cholera preparedness and during response were summarized. We calculated descriptive and analytic statistics; Odds-Ratios (OR) were calculated and variables with p-value ≤0.2 at bivariate were included in logistic regression model and variables with p<0.05 in final model were considered significant.

Results
We line-listed 201 cases; 4 (2.0%) confirmed cases and six deaths (CFR=3.0%). Median age was 22 years (IQR 37), 104 (51.7%) were female, 48 (30.4%) cases were aged <5 years and 151 (75.1%) admitted patients. Dirty latrines (aOR=10.6, CI 1.9-58.8) and drinking untreated water (aOR=2.7, CI 1.1-6.8) were risk factors of being a case. Use of treated borehole water (aOR=0.2, CI 0.07-0.5) and treated protected shallow well water (aOR=0.08, CI 0.02-0.3) were protective factors. Cholera treatment units (CTUs) were not decentralized for patients to avoid transportation. The CTUs lacked proper documentation of cholera response activities, case management flow charts, infection prevention and control protocols and cholera case definition materials. The outbreak response activities were not multisectoral since response was by the department of health only.

Conclusion
Poor latrine hygiene, untreated drinking water and unpreparedness were the main drivers of the outbreak. We recommend health education on latrine hygiene, treatment of drinking water and coordinated multisectoral approach in responding to future cholera outbreaks.
Prognostic factors of short-term neurologic recovery among children with acute flaccid myelitis–Taiwan, 2015–2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 229

**Dr. Pei-Yuan Wu, Dr. Lee Chin Wong, Dr. Jyh-Yuan Yang, Dr. Chia-Ping Su**

**Background**
Global reemergence of acute flaccid myelitis (AFM) since 2014 has been epidemiologically associated with enterovirus D68 (EV-D68), but the determinants of outcome remained unclear. In 2017, Taiwan Centers for Disease Control received increased notifications of AFM coincident with rising detection of EV-D68. We sought to explore the association with EV-D68 and identify prognostic factors of neurologic recovery.

**Methods**
We reviewed the national acute flaccid paralysis surveillance during January 2015–February 2018, and selected AFM patients using US-CDC standardized case definition (2017). We evaluated neurologic recovery by comparing nadir muscle strength (Medical Research Council Scale, MRCS) and functional status (modified Rankin Scale, mRS) at discharge between follow-up within 3 months. Good short-term recovery was defined as improvement > 1 grade of MRCS/mRS, or recovery of MRCS grade 4/mRS score 2. We used Cox proportional hazard model to identify factors associated with good recovery.

**Results**
We included 19 boys and 22 girls with AFM aged from 0.8 to 15.3 years. Twenty-six (63%) occurred during the EV-D68 outbreak (July 2017–January 2018), of which 11 (42%) were tested positive for EV-D68 from nasopharyngeal swab. Mean follow-up duration was 47.8 days (range 5–97). Age, gender, number of involved limbs, cerebrospinal fluid and radiologic findings, and immunoglobulin treatment were not associated with recovery. Compared with patients not involved with EV-D68 outbreak, AFM patients occurred during EV-D68 outbreak were less likely to have good recovery (66% vs. 35%). During EV-D68 outbreak, higher nadir MRCS (HR =2.1; 95%CI: 1.1–4.4) and avoidance of steroid treatment were prognostic factors of good recovery (HR=4.9; 95% CI: 1.2–18.8).

**Conclusion**
The increase of AFM patients was associated with EV-D68 outbreak and the short-term neurologic recovery was less favorable. Steroid in AFM during EV-D68 outbreak should be used cautiously. Enhanced AFM and EV-D68 surveillance through prompt recognition of symptoms, specimen collection, reporting and laboratory diagnosis is crucial to help further understand AFM, including risk factors, treatment and prevention.
Factors associated with the use of long acting reversible contraceptive methods among women of reproductive age- Jinja district, Uganda

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 23

Ms. Helen Nelly Naiga, Prof. Christopher Orach

Background

Long acting reversible contraceptive (LARC) methods are highly effective. However, LARC use in Uganda is at 13%, which is lower than the 57% recommended by the World Health Organisation for low and middle-income countries. We assessed the factors associated with the use of long acting reversible contraceptives among women of reproductive age in Jinja district, Uganda.

Methods

We conducted a facility based cross-sectional study. A total of 314 women aged 15–49 years attending public health facilities (i.e., 1 hospital and 3 level IV health centers) in Jinja district, were randomly selected. A total of 6 key informant and 6 in-depth interviews were conducted. We conducted logistic regression analysis using Stata version 14 to establish factors associated with the dependent variable while adjusting for the multiple potential confounders. Qualitative data were analysed using thematic analysis.

Results

We found that 127 (40.45%) of the 314 respondents had ever used LARC. The commonest LARC method used was implants (38.22%). The factors significantly associated with use of LARC were employment (AOR =2.91; 95% CI (1.05-8.08), Pvalue 0.04), access to LARC methods (AOR =4.48; 95% CI (1.24-16.21,Pvalue 0.03), husband support (AOR =4.90; 95% CI (1.56-15.41,Pvalue 0.02) and experience of no side effects (AOR =3.48; 95% CI (1.00-12.19,Pvalue 0.05).

Conclusion

Employment, husband support, access to LARC methods and lack of side effects were associated with LARC use. There is need to improve accessibility to LARC methods at all levels of health centers, improve male partner’s decision making in LARC use and manage the side effects.
Stillbirths in Jordan: rate, causes, and preventability

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 155

Dr. Rakan Aburoman, Dr. Ahmad Abu-Slaih, Dr. Majed Asaad, Dr. Fatima Zerriouh, Prof. Yousef Khader

Background
Many countries in the region including Jordan do not include stillbirth in their vital statistics reporting system. There are no available data in Jordan about rates and common causes of stillbirth to suggest solutions. This study aimed to determine the stillbirth rate in Jordan and determine the leading causes of stillbirths. Analyzing the stillbirth data from a large sample size of Jordanian women would be very valuable for planning the resources and improving the services.

Methods
The data from the national study of perinatal mortality in Jordan were analyzed. A total of 21,980 women who delivered at a gestational age ≥ 20 weeks in any of the 18 selected hospitals during the study period (March 2011-April 2012) were analyzed. The stillbirth rate was calculated as the number of stillbirths per 1,000 total births. The deaths were also classified according to NICE classification system.

Results
The rates of stillbirths were 11.6/1,000 total births born after 20 weeks of gestation, 11.2/1,000 total births born ≥22 weeks of gestation, 10.6/1,000 total births born ≥24 weeks of gestation, and 9.0/1,000 total births born ≥28 weeks of gestation. According to NICE classification, the main causes of stillbirths were maternal diseases (19.5%), unexplained immaturity (18.8%), congenital anomalies (17.6%), unexplained antepartum stillbirths (17.6%), obstetric complications (8.4%), placental abruption (5.7%) and multiple births (5%). The expert Panel judged that 34.5% of all fetal deaths were preventable and 30.3% were possibly preventable with optimal care.

Conclusion
This study highlighted stillbirth risks in Jordan, which could encourage maternal-infant health care providers, other researchers, policymakers, and stakeholders to implement solutions and to develop a feasible intervention. Antenatal care can potentially serve as a platform to deliver interventions to improve maternal nutrition, screen for and treat risk factors, and encourage skilled attendance at birth.
Risk factors associated with cesarean delivery in pregnant women: Kwanza North Hospital, Angola, 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 145

Dr. Moises Kussevi, Dr. Belchior Silva, Dr. João Pires

Background
Since 1985, the international healthcare community has considered the ideal rate for caesarean sections (CS) to be between 10% and 15%. Over the last decades, there is concern about the rise in CS and the potential negative consequences for maternal/infant health, especially in Sub-Saharan Africa, where, according to WHO the quality of surgical procedures is sub-optimal and the rate of maternal deaths are higher than in western world. We aimed to evaluate the risk factors for CS at a provincial Maternal and Children Hospital (MCH) in Kwanza-North, Angola.

Methods
A 1:2 case-control study was conducted between January and December 2017 among 540 pregnant women (180 cases, 360 controls) who had delivered at the MCH. Cases were defined as women who underwent CS, whereas controls were pregnant women with vaginal deliveries. Semi-structured questionnaires were used for primary data, whereas secondary data was obtained through the review of clinical files. Significance level was set at p<0.05 for all hypothesis tests. Pearson chi-squared (χ²) tests, followed by multivariable logistic regression modeling were used to identify factors associated with CS.

Results
The sample of 540 CS represents 17.7% of all the 1928 pregnant women that had a delivery during the study period. The risk factors identified for CS were: previous CS (Adjusted OR: 8.2; 95%CI: 6.8-15.6); Fetal distress (Adjusted OR: 26.4; 95%CI: 18.4-48.6); Cephalopelvic disproportion (Adjusted OR: 28.0; 95%CI: 17.6-50.9); Premature rupture of membranes (Adjusted OR: 29.0; 95%CI: 18.6-49.4); Placenta previa (Adjusted OR: 12.4; 95%CI: 7.8-22.6); and retro-placental haematoma (Adjusted OR: 11.6; 95%CI: 7.6-19.0).

Conclusion
Even though the prevalence of CS in the MCH of Kwanza-North was higher than recommended by the international community, our study showed that the risk factors identified for CS are indeed the classical CS medical indications. Future studies using the Robson classification as recommended by WHO are warranted to allow for an optimization of the use of CS by focusing interventions on specific groups of particular relevance for each health facility.
Risk Factors Associated with Stillbirths in Kibogora District Hospital, Rwanda, 2015

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 535

Ms. Esperance Niragire, Dr. Laurence Rugema, Mr. Ladislas Nshimiyamana, Dr. Jared OMOLO, Prof. Joseph Ntaganira

Background
Stillbirths remain a major challenge in Kibogora district hospital (DH) catchment area, a largely rural setting of 240,000 people. Among 124 perinatal deaths reported in 2014-2015 in the area, 70.8% of them were stillbirths. We conducted this study to determine the rate of stillbirths in this rural community and identify associated factors.

Methods
We conducted a hospital-based unmatched case-control study. We enrolled 133 stillbirths and 266 live births delivered at Kibogora DH from January to December 2015 as cases and controls respectively. Stillbirths were defined as fetal deaths occurring from 22 weeks' gestation or a fetus born dead and weighing 500g or more. All stillbirths occurring during the period of study were enrolled as cases, while controls were two live births, one before and another after each stillbirth. We used a structured tool to abstract data from delivery and operating rooms' registers and stillbirths audit reports. We conducted the univariate analysis and multivariate logistic regression. We computed adjusted odds ratios (AOR) and 95% Confidence Intervals (CI).

Results
Of the 2,605 deliveries at the hospital, 133 were stillbirths giving a rate of 51 per 1000 births. Among the stillbirths, 71 (54%) were macerated and 62 (47%) were fresh stillbirths. The risk factors for stillbirths identified were preterm delivery (AOR=2.08; 95% CI=1.38 – 20.57); inadequate monitoring of labor by midwives (AOR=3.25; p value<0.001 with 95% CI=2.07 – 6.79) and delay in referrals of high-risk pregnancies from the health centers (AOR=2.24; p value=0.037; 95% CI=1.04 – 4.79).

Conclusion
The risk factors for stillbirths in Kibogora are largely due to preventable health system associated challenges. Timely referral of high-risk pregnancies by health staff at health centers would help to reduce stillbirths in Kibogora. Further investigations on preterm delivery in the catchment area are required.
Factors associated with death in patients with respiratory syncytial virus infection during a Severe Acute Respiratory Infection outbreak, January-March 2019 - Manaus, Amazonas, Brazil.

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 546

Mrs. Olivia Paula, Mrs. Maria Lopes, Mrs. Rosemary Pinto, Mr. Aleksandro Xavier, Mrs. Marinelia Ferreira, Mrs. Eliana Santos, Mr. Francisco Paula Júnior, Mrs. Walquiria Almeida, Mrs. Rejane Lima, Mrs. Daiana Silva, Mrs. Miriam Livorati, Ms. Marcelo Yoshito Wada, Mrs. Fernanda Bruzadelli

Background
In February 2019, during an outbreak of Severe Acute Respiratory Infection (SARI) in Amazonas State, Brazil, cases and deaths of Respiratory Syncytial Virus (RSV) were identified, mainly in the capital, Manaus Municipality. This study aimed to identify risk factors associated with RSV death.

Methods
A case-control study (1:3) was conducted using data from the SARI National Report System (Sivep gripe). Case was the resident of Manaus who had laboratory confirmation for RSV by RTq-PCR and died between January to March, 2019, being control who was cured in the same period. Controls were selected from Sivep gripe system by random selection. Medical records were reviewed and household interviews were conducted with case proxies and controls. Bivariate analysis was made to evaluate factors associated with death and those associated were taken to multivariate analysis. Odds Ratio (OR), adjusted OR (ORA), 95% confidence interval and p<0.05 were used as measures of association.

Results
From January to March, 2019, 793 SARI cases were reported in Manaus and 147 had laboratory confirmation for RSV. All deaths (13) were included in the study and 39 cures (controls) were selected. Factors associated with death in bivariate analysis was: age (highest median for cases, p-value:<0.01), comorbidity (OR:22.7 95%CI:4.6-111.8; p-value:<0.01), cardiovascular disease (OR:11.6 95%CI:1.9-70.6; p-value:<0.01), hospital complication (OR:6.5 95%CI:1.6-32.9; p-value:0.02), invasive procedure (OR:12.4 95%CI:2.4-64.6; p-value:<0.01), days between onset symptoms and search for care (highest median for cases, p-value:0.04). Factors that remained associated after statistic regression were to have at least one comorbidity ORA 32.9 (95%CI 5.0-218.3; p-value:<0.01) and days between onset symptoms and search for care ORA 1.4 (95%CI 1.0-1.9; p-value:0.04).

Conclusion
Comorbidity and delay in seeking timely medical care were associated with RSV death. Appropriate clinical management for patients with pre-existing conditions and orientation to the population to seek for care in the onset of early symptoms in the SARI seasonality period are recommended.
Postpartum Depression among Mothers Attending Primary Health Care Centers in Baghdad, Iraq, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 111

Dr. Zaid Wajih, Prof. Faris Lami, Dr. Riyadh Alredainy

Background
Antenatal and postnatal care traditionally neglects the emotional and psychological health and focuses on physical health and consequently, postpartum depression (PPD) is overlooked and under-diagnosed, locally and globally. PPD is characterized by feelings of extreme sadness, anxiety, as well as changes in energy, sleep, and appetite. The objectives of the study were to estimate the prevalence and identify the determinants of PPD among a sample of newly delivered mothers in Baghdad, Iraq, 2018.

Methods
A cross-sectional study conducted in randomly selected ten PHCCs of five health districts in Baghdad. 594 mothers within the first six weeks after giving birth who attended these PHCCs and agreed to participate were included. Participants’ socio-demographics, certain obstetrical information, and psychosocial information were compiled using a form that was filled through direct interview. PPD was assessed using Edinburg PPD Scale with a cutoff point of ≥12. The unadjusted odds ratio was calculated using logistic regression analysis.

Results
The prevalence of PPD was 34.7% with 95% CI of 30.8 – 38.9. By logistic regression analysis a significant, independent and un-confounded risk factors were neonatal complications (OR= 3.144), history of mental disorder (OR= 2.612), lack of family support (OR= 2.288), pregnancy complications (OR= 2.236), family history of mental disorder (OR= 2.119), and family discord or domestic violence (OR= 1.60). PPD risk was not associated with residence, occupation, educational level, number of children, gender of the last child, and age of husband.

Conclusion
PPD is a significant public health problem which affects more than One third of newly delivered mothers. Promotional and preventive interventions are required to reduce the prevalence of PPD through the integration of mental health care into maternal and child health programs at the primary and secondary level of health care, helping to increase the capacity of health care providers to early detection and management of mental disorders among the most vulnerable mothers.
**Loss to Follow Up and Associated Factors among Women Enrolled in PMTCT Program in Mbeya Region, Tanzania, 2017**

*Mr. EMMANUEL MWAKAPASA, Dr. Ahmed Abade, Prof. Elia mmbaga*

**Background**

More than half of people living with HIV in Sub-Saharan Africa are women. Approximately 1.4 million become pregnant each year; effective implementation of Prevention of Mother to Child Transmission (PMTCT) services, can reduce rate of these women infecting their children to as low as 2%. Loss to follow up (LTFU) stands a major problem to effective PMTCT services in Tanzania. Therefore, we looked at factors associated with LTFU among women enrolled in PMTCT program at health facilities in Mbeya region, Tanzania.

**Methods**

We conducted retrospective cohort study with a nested case control analysis for associated factors. Women enrolled in PMTCT between 1st October, 2016 and 31st March, 2017 in selected health facilities were eligible for the study. A woman was LTFU if consistently out of ART > 90 days since last scheduled appointment within follow up period (1st October, 2016 to 30th June, 2017). These were considered as cases in nested case control analysis. Controls were those started ART under PMTCT, never missed their last scheduled clinic appointment > 90 days within follow up period. We extracted information from 627 patients’ files using data extraction tool to identify cases and controls. Interviewer administered questionnaire with information on socio-demographic and factors associated with LTFU was used to interview 123 cases and 246 controls. Data were entered, cleaned and analyzed using Epi Info 3.5.4 data analysis software.

**Results**

The rate of LTFU was 3.613 per 100 person-months of follow up (95% CI: 3.0-4.3). Among women who were LTFU, half [52.8% (42.8-61.1)] were lost between 1 to 3 months with median follow up time (IQR) of 3(1-5) months. LTFU was associated with age less than 25 years [AOR 2.4 (1.3-4.2)] and not having a treatment supporter at home [AOR 1.98(1.24-3.17)]. Women who lived 1km to 3kms, and more than 3 kms away from clinic had lower odds of loss to follow up [AOR 0.49 (0.28-0.84)] and [AOR 0.17 (0.09-0.32)] respectively.

**Conclusion**

LTFU occurs early after enrollment and more substantial for young women. Presence of treatment supporter and distance to the facility plays an important role in retention to care.
Maternal Death Surveillance in Deïdo Health District - Littoral Region, Cameroon, 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 70

Dr. Marcel Wilfried Nwaha Nwaha, Dr. Gaël KOUMEN TCHOUNKEU, Dr. Linda ESSO ENDALLE, Dr. Georges Alain ETOUNDI MBALLA

Background
In Cameroon, the 2011 overall maternal mortality ratio (MMR) was estimated at 782 deaths per 100,000 live births. Maternal Death surveillance (MDS) by health facilities began in 2014. However, MDS is reportedly plagued with under-reporting of cases and poor data quality. The purpose of this study was to evaluate the MDS system in Deïdo Health District (HD), in Littoral Region.

Methods
We used the updated CDC guidelines for evaluating public health surveillance systems. From January to December 2017, in eight conveniently chosen health facilities in Deïdo HD, data were collected from all MDS staff points of contact, weekly health facility forms, registers of labor and delivery, hospitalization, surgery, emergency and intensive care units. Scorecards were developed to assess data quality, sensitivity, acceptability and usefulness. Data were analyzed using proportions and percentages.

Results
Out of nine MDS points of contact interviewed, eight correctly defined MD; of which six were midwives. Of the 62 maternal deaths recorded in registers, in three of the eight health facilities, 61% (38/62) were reported to the health system, which is below the 90% national standard. Two respondents considered the time needed to fill the form as lengthy (>10minutes). Overall, 324/417 (78%) of notice cards reviewed, were correctly completed. Notice cards were timely sent to the district health service in 80% (373/468 ) of cases,. MDS was satisfactorily scored given all respondents reported MDS monitoring as part of their daily work. Furthermore MDS monitoring guided the HD management team in briefing 4th and 5th category health facilities on prompt and adequate referral of obstetric emergencies to the next level.

Conclusion
The MDS at the Deïdo HD facilities was useful, acceptable with good data quality and a sub optimal reporting sensitivity. Implementation of data supervision and validation activities might improve the sensitivity of this HD system.
**Surveillance Evaluation of Severe Maternal Morbidity - La Altagracia, Dominican Republic, 2017-2018**

**Dr. Mercedes Cueto, Dr. Samuel Cueto**

**Background**
Severe maternal morbidity (SMM) is a public health problem and its surveillance is a strategy proposed to reduce the maternal mortality rate. It is estimated that 40% of women will develop complications during pregnancy, delivery and puerperium and sometimes almost die. Since 2013 it’s an immediate mandatory notification event. We evaluated attributes of Severe maternal morbidity surveillance system (SMMSS) in La Altagracia province 2017-2018.

**Methods**
We conducted a descriptive study of the SMMSS, defined as any woman who during pregnancy, childbirth or the first 42 days of the puerperium present at least one of the criteria defined in the surveillance protocol of the National Epidemiological Surveillance System (SINAVE). We apply anonymous qualitative survey to Maternal health services (MHS) surveillance officers and analyze the notification flow to assess simplicity and acceptability, we analyzed data quality, notification opportunity and review the completeness of demographic, clinical and diagnostic data, of the SINAVE database and hospital records and perinatal clinical history of MHS.

**Results**
53% (8/15) persons responsible for notification were surveyed. 88% (7/8) answered questions related to simplicity, 100% of them reported that the electronic system is relatively easy to operate, although they claim that it requires irrelevant data, and had difficulty to loading and extracting data. 50% (4/8) of respondents expressed doubts about the criteria to classify an event as SMM. Only 27% (4/15) of the MHS had notified cases to the SINAVE. 19 SMM were reported for the 2017-2018 period, 79% (15/19) was notified by one of the MHS. 37% (7/19) met the case definition and 95% (18/19) were reported with incomplete data. The average number of notification days was 2 (range 0-7 days). When reviewing medical records at Maternal Health Service (MHS), we identified 117 cases of SMM in 2017 that met at least one inclusion criteria and had not been notified.

**Conclusion**
Although surveillance of Severe Maternal Morbidity (SMM) is relatively simple, acceptability is low. Lack of knowledge in detection and notification procedures affects the quality of the data. We recommend strengthening SMM surveillance especially in detection and notification procedures.
Postpartum Depression and Associated Factors among HIV Infected Mothers at Mulago Referral Hospital – Uganda, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 270

Ms. Magdalene Akos Odikro, Ms. Naomi Kyeremaa Yeboa, Dr. Patience Mwawunzi, Mr. Tom Denis Ngabirano

Background
Among postpartum mothers living with HIV infection, postpartum depression (PPD) impacts negatively on their wellbeing. PPD affects self-care, infant care, adherence to antiretroviral treatment (ART) and HIV treatment outcomes of the mother and infant pair. In developing countries, an estimated 19.8% of mothers living with HIV are co-infected with PPD. In Uganda, evidence of PPD among HIV positive mothers is limited. We determined the prevalence and associated factors of PPD among HIV infected mothers in Mulago Hospital.

Methods
A quantitative cross-sectional study was conducted at Mulago Hospital from January to March 2018. HIV positive postpartum mothers (four weeks to one-year after birth) were interviewed. The validated patient health questionnaire nine (PHQ 9) was used to screen for the existence of PPD. Using the Mental Health diagnostic tool manual, a cut-off score of ≥ 5 was considered as having PPD. We collected data on demographic, community and health facility factors. Prevalence of PPD was determined. Binary and multivariate logistic regression were used to determine association between PPD and factors with P-value <0.05 considered significant.

Results
Overall, 290 postpartum women were accessed with majority 71.7% (208/290) having more than four children. The prevalence of PPD among HIV infected mothers was 46.9% (136/290). Factors associated with PPD among HIV infected mothers were: being ashamed to disclose HIV status (AOR=4.06, P=0.005), having poor partner support (AOR=2.89, P= <0.001), having experienced a bad event recently (AOR=4.06, P= 0.003), primiparity (AOR=0.54, P=0.035) and travelling five kilometers or less to access healthcare (AOR=0.49, P=0.003).

Conclusion
The prevalence of PPD among HIV infected mothers in this study was high. We recommend that Ministry of Health should ensure periodic screening for depression among HIV infected mothers at antenatal and postnatal clinics. Mothers identified as high risk for PPD should be followed up and interventions including counselling and treatment implemented as appropriate.
Soil-Transmitted Helminths and Associated Factors among Children Less than 15 years in Internally Displaced Persons Camps in Maiduguri Metropolis, Borno State – Northeastern Nigeria, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 597

Dr. Batula Bishara Daggash, Mrs. Lilian Okeke, Dr. Olanrewaju Jimoh, Prof. Adebola Olayinka, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Background
Soil-transmitted helminths (STH) affect 1.5 billion people worldwide due to lack of sanitary facilities, safe water, inappropriate waste disposal systems, and low economic status. Nigeria has the highest burden in sub-Saharan Africa with a prevalence of up to 78%. Epidemiological information on the burden of soil STH among internally displaced persons (IDP) is invaluable towards developing preventive and control measures. We conducted a study to determine the prevalence of STHs and assess their associated factors among children less than 15 years of age in IDP camps in Borno State.

Methods
We conducted a cross-sectional study in IDP camps in Maiduguri Metropolitan Local Government Area, Borno State, from February to April 2018. Using a multi-stage sampling technique, we selected 361 children. From each child, we collected stool samples and examined microscopically for eggs of STHs using iodine and saline wet mounts after fecal concentration. Using an interviewer-administered questionnaire, we collected socio-demographic and risk factors data. We calculated frequencies and proportions, odds ratios and 95% confidence intervals (CI). Adjusted odds ratios (AOR) were obtained using logistic regression.

Results
The mean age of respondents was 6±3 years. The overall prevalence of STHs was 16.1%. *Ascaris lumbricoides* was the most common worm accounting for 8.3%, hookworms 6.3% and 1.1% had combined *Ascaris lumbricoides* and hookworm infection. Playing in dirty or stagnant water (AOR= 2.1, 95% CI= 1.1-4.5) and not washing hands with soap after defecation (AOR= 2.5, 95% CI= 1.3-4.5) were significantly associated with having STHs.

Conclusion
STHs were found to be prevalent among children in IDP camps in Borno. We gave health talks on the benefits of hygiene and offered anti-helminthic drug treatment to every infected child. We recommend that the government should provide potable water, continuous mass drug treatment among children, sanitary facilities, and promote personal hygiene in camps in Borno.

Background
Globally, maternal mortality rates have declined since 1990, but still, 830 women die every day from pregnancy or childbirth related causes that are often preventable. Additionally, 99% of these deaths occur in low and middle income countries. However, the mortality measurement remains a critical challenge. For instance, in Togo, maternal deaths are underreported, because of the lack of consistent vital statistics due to limited resources. In 2013, the Maritime region implemented the Maternal Death Surveillance and Response (MDSR) system. The purpose of our study is to assess the MDSR system in the Maritime region.

Methods
We conducted a cross-sectional study from January to June 2018 for the first evaluation of the MDSR and administered a structured questionnaire to involved public health workers. We reviewed death reporting forms for data quality assessment, entered data using MS Excel and analyzed them with Epi Info 7. In accordance with the 2001 CDC guidelines for evaluating surveillance systems, we assessed the following attributes: data quality, acceptability, simplicity, stability, representativeness, usefulness and Positive Predictive Value (PPV).

Results
Of 229 public health workers, a total of 156 (68%) participated in the survey. Approximately 65% of respondents agreed on the usefulness of MDSR and 55% on the simplicity. The representativeness of data providers (3 districts out of 7) was low. For 49% of respondents, the system is binding, 8% did not comment on this aspect, while 43% believed it is not binding; this finding indicates a low acceptability. Data completeness varies from 41.6% to 68% per form; important variables were more concerned with missing answers. In 2017, 37 maternal deaths were reported a high positive predictive (100%) compared to the records of the hospitals.

Conclusion
This study reveals several weaknesses in the MDSR system in the Maritime region: data quality, representativeness and acceptability are not good. Decision-makers must put the necessary resources in place to provide training for health workers, monitoring and supervision. Furthermore, setting up a motivation system would be beneficial for the system.
Pediatric Blood Lead Level Testing Rates Among Populations with Risk Factors for Lead Exposure — Indiana, 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 506

Dr. Kathryn L Gaub, Mr. Paul Krievins, Ms. Amy Hancock, Dr. Jennifer Brown

Background
Pediatric lead exposure can have detrimental effects on cognition and other health outcomes. Common risk factors for lead exposure include residence in older housing and lower socioeconomic status (SES). Blood lead level (BLL) screening is recommended for all children, with testing encouraged for those at risk, and testing required for those enrolled in Medicaid; results of all BLL tests are reportable in Indiana. We examined rates of pediatric BLL testing among populations with risk factors for lead exposure to guide public health outreach.

Methods
The addresses of Indiana residents aged <7 years with ≥1 BLL test in 2017 were geocoded by census tract; BLL testing rates were calculated. Estimated proportions of the population residing in homes built pre-1940, and those aged <18 years enrolled in Medicaid (proxy for low SES) were obtained from the 2016 American Community Survey and mapped by census tract using Esri ArcGIS Desktop 10.5.1. Census tracts with higher proportions (>60%) of risk factors and lower (<50th percentile) pediatric BLL testing rates were identified.

Results
In total, 65,297 children aged <7 years had ≥1 BLL test reported in 2017, with a median testing rate of 73 tests/1,000 population (range: 2–2100). Addresses of 49,434 (76%) children were geocoded. Among 1,511 census tracts, 240 (16%) had >60% of children enrolled in Medicaid and 80 (5%) had >60% of homes built pre-1940. Eight (0.53%) census tracts had higher proportions of both risk factors and lower BLL testing rates (range: 51–73/1,000 population). All were located in urban areas, including Indianapolis (3), Fort Wayne (2), Muncie (2), and Evansville (1).

Conclusion
We identified areas with low pediatric BLL testing rates despite higher proportions of risk factors for lead exposure. Outreach to healthcare providers in these areas might help identify children with previously unrecognized need for medical treatment and environmental remediation to reduce future exposures.
Largest Methanol Poisoning Outbreak in Malaysia, September 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 43

Dr. Zulraini Jusof, Dr. Rusdi Abdul Rahman, Dr. Siti Halimah Syed Shaikh, Dr. Harishah Talib, Dr. Hasrina Hassan, Dr. Rohani Ismail, Dr. Marina Kamarudin, Dr. Noorhaida Ujang, Dr. Suhaiza Sulaiman, Dr. Mohd Hanif Zailani, Dr. Amirullah Mohd Arshad

Background
On 15/9/2018, one dead body found and two patients were admitted to Selayang Hospital, Selangor for vision loss after consuming illicit liquor 2-days prior to their illness. Outbreak investigation was conducted to identify the source, possible risk factors and recommend control measures to prevent future outbreaks.

Methods
Descriptive epidemiology was done to investigate the source. We conducted 1:1 unmatched case-control study in Selangor from 20/9/2018-20/10/2018 using 26 cases and 26 controls from active case detection (ACD). We used semi-structured questionnaire to collect data on socio-demographics, alcohol behavior, brand, additional content of liquor, smoking status, medical illness, symptoms and treatment. Based on national guidelines, confirmed cases were those with methanol in their blood/urine. Controls were defined as healthy colleagues of cases who consumed liquor within 5-days OR suspected/probable case with methanol undetected in their blood/urine. Methanol levels from patient’s sample and suspected liquor were tested at manufacturing, selling and consumption sites. Data were analysed using SPSS (Version 24) and possible risk factors were determined using Multiple Logistic Regression.

Results
Total of 97 patients with 48 deaths (case fatality rate: 49.5%) were involved from Selangor [64 patients (66%); CFR: 46.9%]; Kuala Lumpur [17 patients (17.5%); CFR: 76.5%]; Perak [13 patients (13.4%); CFR: 30.8%] and Negeri Sembilan [3 patients (3.1%); CFR: 33.3%]. Mean age was 36.6±9 years with 51.1% of them aged 31-40 years-old. Almost all were male (ratio 1:0.01), mostly non-Malaysians (76%) and worked as factory workers/laborers (48.5%). About 71.1% claimed consumed illicit liquor 5-days prior to illness. The commonest symptoms were vomiting (54.6%), abdominal pain (43.3%), blurred vision (41.2%) and blindness (32%). Among cases, 38.1% need intubation, 28.9% admitted to ICU, 41.2% need ethanol (antidote) and 21.6% need haemodialysis. About 63% of cases were confirmed methanol poisoning based on laboratory/post-mortem results (90% of post-mortem positive poisoning). Laboratory findings among cases revealed methanol toxicity [median serum methanol: 46.50 (IQR: 0.00-122.5) mg/dl and urine methanol: 115.00 (IQR: 72.5-210.0) mg/dl] and toxic levels of methanol in liquor sampled [86% leftover bottles were toxic ranged 695-198,700 mg/L and 24% from market ranged 8,720-173,600 mg/L]. Significant risk factors were consumption of illicit liquor [AOR: 30.09, 95% CI: 3.31-273.71; p-value = 0.003] and smoking [AOD: 5.75, 95% CI: 1.27-26.08; p-value = 0.023].

Conclusion
Consumption of illicit liquor contaminated with methanol was the cause of this outbreak. Outbreak successfully controlled in 2 weeks with effective control measures and multi-agency collaboration. The main preventive action was health education to high risk groups, enhanced surveillance and continued collaboration between relevant authorities.
Assessment of the biorisk management of a Public Health Reference Laboratory, Northern Region, Ghana-2018

Mr. Daron Davies Atsu-Agbo Agboyie, Ms. Irene Amedzro, Dr. Donne Ameme, Ms. Delia Bandoh, Dr. David Opare, Dr. Gifty Boateng, Dr. Samuel Sackey, Mr. Jacob Arthur Quarm, Dr. Ernest Kenu, Prof. Edwin Afari

Background
Biosafety and biosecurity remain critical in ensuring global health security. Laboratory bio-risk management is key in ensuring biosafety, biosecurity and biocontainment of biological and chemical hazards. In the 2017 Joint External Evaluation (JEE) for Ghana, the country scored two (2) in biosecurity and biosafety. Sequel to this, the Public Health Reference Laboratories (PHRL) were assessed and key bio-risk management interventions such as physical security, capacity building and equipment installation were implemented. We conducted an assessment of the PHRL one-year post implementation of the key bio-risk management interventions.

Methods
We used the Biosafety and Biosecurity Laboratory Assessment Tool (BSS-LAT) for the pre and post intervention assessment. We assessed bio-risk management practices at the PHRL, interviewed both medical and non-medical laboratory staff, reviewed documents and made direct observation of design and work flow in the laboratory to compute assessment scores. We compared current and baseline assessment scores of the ten indicators (modules) to determine improvement in bio-risk management levels.

Results
There has been significant improvement in the overall performance in the biosecurity and biosafety post implementation percentage values from 55% baseline to 67%. Specific indicator scores that improved marginally over baseline scores were premises and workflow (56% to 64%), emergencies (60% to 67%) as well as documentation and regulations (58% to 69%). Markedly improved scores were recorded for staff management and training (66% to 79%), good laboratory practices (57% to 77%), risk management (15% to 55%) and biosecurity (67% to 89%). Cleaning, disinfection, sterilization and waste management as well as other risks downgraded from 67% to 66% and 52% to 41% respectively.

Conclusion
Bio-risk management practices in the PHRL improved significantly one year after implementation of post-JEE remedial bio-risk management practices. Based on our recommendation, training and sustained oversight supervision of laboratory staff are being implemented as means of strengthening indicators with downgraded scores.
Community Assessment for Public Health Emergency Response and Health Education following Cyclone Idai in Manicaland Province, Zimbabwe, 2019

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 362

Mr. Simbarashe Chiwanda, Ms. Tsitsi Juru, Dr. Emmanuel Govha, Ms. Tendai Chipendo, Dr. Alex Ingwani, Mr. Raphias Shabeyanga, Mr. Chamunorwa Mhembe, Dr. Blessing Mushangwe, Ms. Vaida Kamazizwa, Mr. Paul Musarurwa, Dr. Ronald Nyabereka, Dr. Gerald Shambira, Dr. Notion Gombe, Prof. Mufuta Tshimanga

Background
Cyclone Idai affected Manicaland province between 14-17 March 2019. Flooding and mudslides ensued, resulting in an estimated 181 deaths and 347 missing. Over 50 000 households were affected. We determined the health status, damage, and water and sanitation needs of residents living in affected districts of Chipinge and Chimanimani to better inform critical health relief efforts.

Methods
We conducted a descriptive cross-sectional survey using the CDC Community Assessment for Public Health Emergency Response (CASPER) toolkit. A healthcare adapted CASPER questionnaire was used to collect information on damages, utilities, health status, disease surveillance and food supplies at household level. We used a checklist to collect information on water, environment, sanitation and hygiene activities. Sectorial reports were reviewed to obtain information on total number of people affected, died and missing. Epi Info™ 7.0 was used to generate frequencies and proportions.

Results
We recruited 248 households, 38% (95/248) had evacuated from their residence during/after the cyclone and 32% (81/248) had uninhabitable homes. Twenty-one percent (52/248) were injured during the cyclone, 23% (57/248) had diarrhea and 13% (31/248) reported at least one death in their households. Twenty-six pregnancies were reported, of these 46% (12/26) were booked. Ninety-six percent (237/248) were collecting drinking water from unprotected sources and 58% (143/248) had no working toilet. Those who had adequate food for the next 3 days were 56% (140/248) and of the 50 households who had a patient on chronic medication, only 42% (21/50) had adequate medicines for 7 days

Conclusion
Cyclone Idai left a significant proportion of the population injured and in need of healthcare services. We thus recommended mosquito nets distribution and intensified disease surveillance through community health workers, supplementary food programs and urgent rehabilitation of water and sanitation facilities. Health education was given to all households and 49 patients were treated for diarrhea, cuts and respiratory infections.
Measles Outbreak in a Highly Urbanized City, Davao City, Philippines, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 295

Ms. Farah May Clamor, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Background
On December 27, 2017, the Epidemiology Bureau received report of measles cases with two deaths in Davao City. An FETP team was sent to profile cases, determine existence of outbreak, source, and risk factors, and recommend control and preventive measures.

Methods
We conducted a matched for age and sex 1:1 case-control study. A suspect case is a previously well individual in Davao City with fever and rash and any of the following: cough, coryza, and conjunctivitis from November 2, 2017-January 12, 2018. A confirmed case is a suspect case positive for Measles IgM antibody on enzyme linked immunosorbent assay or viral isolation by Polymerase Chain Reaction. Key informant interview and environmental survey were conducted.

Results
We identified 223 cases. One hundred eighteen (53%) were males. Age ranged from one month to 40 years (Median=1). Four died (CFR=1.8%). National Immunization Program provides measles vaccination for children aged 9 and 12 months. Of 185 (83%) without measles vaccination, 38% were aged <9 months. 2017 Measles vaccination coverage (MCV) was 78.5% and 63.7% for 1st and 2nd doses, respectively. Vaccination was challenging due to high population mobility, religious beliefs, and misconceptions. High number of evacuees from recent Mindanao siege seen in one village. Houses are one-room dwellings and clustered. Twenty-eight (70%) of 40 specimens were Measles IgM positive. Risk factor was having a sick household member (OR=13.37, 95%CI=2.89-61.75). Having measles vaccine (OR=0.08, 95%CI=0.02-0.37) was protective.

Conclusion
There was an outbreak of measles in Davao City from November 2017 to January 2018. Influx of displaced persons in a community with low MCV and continuous household exposure increased risk for disease. Outbreak response immunization was conducted among 6-59 months. We intensified masterlisting and defaulter tracing among targeted age groups. We collaborated with schools and private sector to increase awareness of importance of vaccination and immediate, proper case management.
Diphtheria Epidemic- Yemen, June 2017-August 2018

**Dr. Basher Aboasba, Dr. Suaad Moghalles, Dr. Mohammed Al Amad**

**Background**
By the end of 2017, as a consequence of war and collapse of health system, diphtheria is re-emerging in Yemen. The aims are to describe the epidemiology of diphtheria, determine the vaccination status of affected population and provide recommendations for interventions.

**Methods**
Analysis for surveillance data was performed. Data for reported patients who meet the WHO case definition of diphtheria was obtained from diphtheria surveillance program. Population from Central Statistical Organization was used for calculating incidence per 100,000 of population. P value < 0.05 was the cut point for significance.

**Results**
From June 2017 to August 2018, a total of 2,243 patients were reported. Out of them 1390 (62%) were ≤ 15 years old, 1144 (51%) were females, 1099 (49%) were unvaccinated, 830 (37%) partially vaccinated and 180 (8%) were confirmed by microbial culturing. The patients were reported in 20/23 (87%) governorates. The overall incidence was 8/100,000, significantly higher in three governorates; Al Dhale'e, Ibb and Sana’a (20/100,000 vs 7/100,000, P value <0.001) and among age group <15 years (11/100,000 vs 5/100,000, P value <0.001). The overall case fatality rate (CFR) was 5.3% compared to standard WHO estimate (10%). CFR was significantly higher in difficult access governorates; Raymah, Abyan, Lahj, Al Jawf and Sa’adah, (22% Vs ≤ 10%, P value <0.001) and among children < five years (10% vs. 4%, P value <0.001).

**Conclusion**
Diphtheria reported in 87% of Yemeni governorates. The majority of patients were partially or not vaccinated. Children ≤ 15 years were more affected with higher fatality among < five years. Five governorates due to difficulties in access had double CFR of WHO stated. Strengthen outreach immunization coverage and introduce booster vaccination against diphtheria in whole governorate especially in difficult access governorates; Raymah, Abyan, Lahj, Al Jawf and Sa’adah, is crucial to control epidemic. Increase public health awareness toward diphtheria disease to control and prevent more cases. Strengthen the surveillance of Diphtheria for early detection, immediate response and providing antitoxin in difficult access areas are recommended.
Increase of invasive meningococcal disease by serogroup W in Santa Catarina, state of South of Brazil, 2017 to 2018.

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 522

Mrs. camilla ribeiro, Mr. Isaquel Silva, Mr. Igor Ribeiro, Ms. Camila Portela, Mrs. Rejane Alves, Mrs. Maria Agostini, Mrs. Lia Coimbra, Mrs. Gisele Barreto, Mr. Fabio Faria, Mrs. Alda Silva, Ms. Camile Moraes, Mr. Jadher Percio, Mrs. Juliane Malta

Background
Meningococcal disease (IMD) in Brazil is considered endemic (incidence rate of 0.5 cases/100,000 inhabitants) with sporadic outbreaks. In 2017 and 2018 the most prevalent serogroups were: C(59.0%), B(28.0%), W(9.0%) and Y(3.0%). The circulation of serogroup W is located in some Brazilian states. In the coastal range of the state of Santa Catarina, in the period 2015-2016, 11 cases of IMD were recorded by serogroup W and in the period 2017-2018, 52 cases, representing an increase of 372.7%. Objectives of the study were to characterize the DMI profile by serogroup W and to analyze the prognostic factors for deaths and sequelae.

Methods
Retrospective cohort study, considering confirmed cases of IMD from January 1, 2017 to December 31, 2018. Non-serogrouped cases were excluded. The exposed were cases of IMD serogroup W and the unexposed belonged to the other serogroups. We reviewed the medical records and interviewed cases or guardians. The measure of association used was relative risk (RR) with 95% CI for death outcomes and sequelae.

Results
The study included 113 IMD cases, 52 (46%) of serogroup W. Of these, 55.8% were female and 12 died (lethality rate:23.1%). IMD serogroup W incidence rate at <5 years was 5.01 cases / 100,000 inhabitants.W:2a:P1.2 strain was more frequent. No case had ACWY vaccine. 21 IDM serogroup W(40.4%) had sequelae. Prognostic factor for sequelae was complications during hospitalization-acute renal failure (RR:2.21;95%CI:1.74-2.79;p-value:0.003); for deaths were: having IMD by serogroup W aged 15-29 years (RR:3.86;95%CI:1.25-11.90,p-value:0.015) and meningococcemia (RR:3.91,95%CI:1.61-9.49;p-value:0.001).

Conclusion
There was an increase in serogroup W, a high incidence in children <5 years and a high mortality rate in adolescents and young adults, which should be monitored. The ACWY vaccine should be considered for children under 5 and individuals aged 15-29. Risk factors may help in selecting patients who need the most appropriate care and most intensive supportive therapy.
Measles outbreak in a marginalized population of Jogapatti block of West Champaran district, Bihar, India, October 2018-March 2019

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 523

Dr. Vishesh Kumar, Dr. Sushma Choudhary, Dr. Ankur Nair, Dr. Sanjay Kumar Singh, Dr. Nihar Ranjan Ray, Dr. Pauline Harvey

Background
India targets measles elimination by 2020 and reported 931 outbreaks in 2018 (43% from Bihar). On February 2, 2019 a suspected measles outbreak was reported from a marginalized community of Jogapatti block, Bihar. We investigated to describe epidemiology, identify risk factors and provide recommendations.

Methods
We defined a case as fever and maculopapular rash with cough, coryza or conjunctivitis in a resident of Jogapatti block from October 1, 2018-March 31, 2019. We conducted house-to-house case search and a retrospective cohort study among children ≤5 years for risk factors in most affected Dhadhwa village. We assessed block routine immunization system and tested five serum samples for measles IgM.

Results
We identified 256 cases (51% females) in eight villages of Jogapatti block {attack rate (AR)=2%} with median age 45 months (range=6m-35y). Dhadhwa village had 81 cases and seven deaths {AR=5%; case fatality rate (CFR)=8.6%}. Attack rate in Mushar community was 44% (48/108). All seven deaths were among unvaccinated Mushar community (CFR=14.5%); none received medical care or post-rash vitamin A. Coverage for children 12m-60m for first dose measles containing vaccine (MCV1) was 64% (145/227) and vitamin-A 21% (17/81). No MCV (RR 3.1, 95%CI=1.8-5.4) and vitamin-A (RR 2.6, 95%CI=1.5-4.5) were associated with illness; vaccine effectiveness for MCV1 was 77%. Among 82 (36%) not completely vaccinated, main reasons reported were fear of illness (38%), un-awareness about vaccine benefits (33%), and inconvenient session site (30%). Immunization microplans were incomplete and staffs were not trained in counting children due for vaccination. Three of the five samples tested positive for measles.

Conclusion
We confirmed a measles outbreak in a low-vaccination area with high case fatality, likely due to poor healthcare access. We recommended two doses of vitamin-A for cases, microplanning of session sites and creating community awareness about vaccination benefits. Our investigation led to intensive vitamin-A administration and measles-rubella campaign strengthening.
Early exposure to influenza A(H3N2) viruses and vaccine effectiveness against A(H3N2)-associated illness in U.S. children <18 years, 2016–18

Background
During 2017–18, influenza vaccine effectiveness (VE) against A(H3N2) illness was highest among children <5 years compared to all other ages. The emergence of antigenically distinct influenza A(H3N2) viruses in 2014–15 provided an opportunity to explore potential effects of first virus infection on vaccine effects. We compared VE against influenza A(H3N2) during 2016–17 and 2017–18 among children born after and before 2014.

Methods
Outpatient children aged 6 months–17 years with acute respiratory illness with cough were enrolled in the United States Influenza VE Network and tested for influenza infection by RT-PCR. Vaccination status was derived through medical records and immunization registries. We used a test-negative, case-control design to estimate VE and 95% confidence intervals (CI) from logistic regression, adjusting for surveillance site, enrollment month, presence of high-risk condition, and race/ethnicity. Cohorts were defined by birth after or before June 2014, before the 2014–15 influenza season where a new A(H3N2) predominated; we assumed exposure to the new A(H3N2) virus among children born after June 2014.

Results
During 2016–17, among 2,545 children, 445 (18%) tested positive for A(H3N2) and 1,809 (71%) tested negative. The remainder tested positive for co-infections. VE against A(H3N2) did not differ among children born after June 2014 and among those born before June 2014 [49% (95% CI: -12%, 77%) vs. 43% (27%, 55%); interaction P<0.75]. During 2017–18, among 2,936 patients, 631 (22%) tested positive for A(H3N2), and 1,852 (63%) tested negative. VE against A(H3N2) was 59% (36%, 74%) among children born after June 2014 versus 20% (-1%, 37%) among those born before June 2014 (interaction P<0.01).

Conclusion
We did not consistently see differences in VE against A(H3N2) between children potentially exposed to different A(H3N2) viruses. However, error in exposure assignment to A(H3N2) viruses and only a few seasons since the emergence of the new A(H3N2) viruses limit our interpretation. Alternative explanations for age-related differences will also be explored.

Dr. AMAL HAMDI, Dr. MOHAMMED KAHHOULI, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUINIM BELALIA, Prof. Asmae Khattabi

Background
Meningitis disease is a serious illness that causes ~1.2 million cases of meningitis Worldwide. In Morocco, meningitis occurs in sporadic, endemic or epidemic status. The national incidence of all types of meningitis was 2.85/100,000 inhabitants in 2016, and the incidence of meningococcal meningitis was 1.8/100,000 inhabitants. The objective of this study is to describe the epidemiological, clinical and biological profile of meningitis in the province of Settat between 2008-2018.

Methods
We performed a descriptive analysis of a case series of all forms of meningitis reported by the provincial epidemiological surveillance system for meningitis between 2008 and 2018. We reviewed the reports of meningitis cases reported by attending physicians and the laboratory's registry of meningitis cases. The laboratory reported all the results of analysis of patients suspected of meningitis who have undergone a lumbar puncture. Data analysis was performed by Epi-Info 7 at a 95% confidence level.

Results
A total of 403 cases were analyzed. The median age was 6.5 years, with an interquartile range [2-18]. The 5-15 years age group was the most affected, accounting for 29% of age groups. These age ranges: under 3 months, 3 months-2 years, 2-5 years, 15-40 years and 40-65 years are represented respectively: 9.75%, 14.75%, 16.50%, 19.50%, 10.50%. The sex ratio M/F was 1.6: 1. Meningococcal meningitis accounted for 48% of cases. The average annual number of cases was 36.63 with a stable overall temporal trend. The incidence rate of all forms of meningitis was 6 per 100,000 populations. We observed seasonal variability in the distribution of meningitis cases. The main clinical signs in our series are fever (94.30%), vomiting (79%), headache (70.35%) and seizures (29%), neck stiffness (77%). A purpura is found in 14% of cases. The biological confirmation rate was 29% including Neisseria meningitidis (10%), Streptococcus pneumoniae (15%) and Haemophilus influenzae (1%). Case Fatality Ratio was 10.42%.

Conclusion
The high incidence of meningitis in Settat suggests population immunization is either not done or not preventing transmission to unvaccinated persons. These findings highlight the importance of strengthening provincial surveillance and building sustained laboratory diagnostic capacity for with a biological confirmation.
Measles outbreak in Jeddah city, KSA 2017-2018: Matched Case-Control Study

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 212

Dr. Abdullah Hussain, Prof. Shady Kamel

Background
Measles is a highly contagious viral disease that can lead to serious complications and even death. Some districts of Jeddah constantly reported low or unknown measles vaccination rates. We investigated a measles outbreak in Jeddah, Saudi Arabia, between October 5, 2017 to March 5, 2018. We sought to describe the scope of the outbreak and identify possible risk factors.

Methods
We conducted a case control study. We defined cases as any measles case laboratory confirmed by positive ELISA IgM test. We randomly selected controls from ill individuals who tested negative for measles and matched by neighborhood. We used surveillance data from the measles program for Jeddah region and directly interviewed cases or parents of cases using the Saudi Arabian Ministry of Health measles questionnaire. Variables included demographics, vaccination history, contact history and clinical data. We used SPSS ver. 23 for statistical analysis.

Results
A total of 222 participants responded: 111 were cases. Cases were mostly under 1 year of age (31%), and (22%) were 1-5 years. Cases were geographically located in four districts in southern Jeddah represented (38%) of cases, (60%) of them were non-Saudis. These districts are mostly slums, with lower socioeconomic status residents. We found significant differences regarding vaccination status between cases (97% unvaccinated) and controls (35% unvaccinated) (P value< 0.01 , OR=0.015, 95%CI=0.004-0.051).

Conclusion
The main reason for this outbreak was unvaccination. We recommend further studying of reasons for not taking the vaccine especially in southern of Jeddah.
Inter-county travel leading to measles outbreak in German Camp, Gibi District, Margibi County, Liberia, September 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 314

Dr. Maame Amo-Addae, Dr. Peter Adewuyi

Background
Despite the availability of a safe and cost-effective vaccine, measles remains one of the leading causes of morbidity and mortality among children. On September 3, 2018, German Camp reported five suspected cases of measles. The surveillance team conducted an outbreak investigation to confirm the outbreak, describe the outbreak determine the source and control measures.

Methods
German Camp, Gibi District has a catchment population of 7,395. We reviewed, charts and medical records at health facility. We visited homes of affected case-patients, reviewed their vaccination cards and conducted active case search using an outbreak case definition of: anyone from German Camp presenting with high fever and rashes and or runny nose or conjunctivitis from September 1st to October 19, 2018 or in whom a clinician suspect of measles. We analyzed and presented the results in proportions and rates.

Results
Of the 17 cases identified, 12 (71%) were female, median age was 6 (2 -35) years. The attack rate was 23 per 10,000 population and there were no deaths. The index case is a 37 year- old female who traveled to Gbatala, Bong County, when there was an on-going confirmed outbreak of measles and returned late August 2018. She developed symptoms one week later, on September 1, 2018 and presented along with 2 of her children whose blood specimens all tested positive for measles IgM. Measles vaccine coverage at the Camp was 49% between January to August of 2018. We vaccinated 811 (97%) of the targeted 832 under five children in a mini vaccination campaign.

Conclusion
This was a confirmed outbreak of measles. The source of the outbreak was in Gbatala, and low vaccine coverage could have contributed to the spread of the disease. Outbreak was declared over after two incubation periods (28 days) when last case was reported Oct.19, 2018. We recommended periodic analysis of vaccine coverage so as to organize supplementary campaigns.
Immunization Coverage and Factors Associated with the Non-Vaccination of children aged 12 to 23 months - Goulfey Health district, Far North region Cameroon 2018

Dr. Céline Mairousgou Tchida, Mr. Athanase ATEBA ABINA, Mr. Ndode Corlins, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA, Prof. Dickson SHEY NSAGHA

Background
Cameroon has set targets for immunization coverage for at least 90% for Expanded Program on Immunization (EPI). Between 2014 and 2016 only the Goulfey health district (HD) did not meet this target in the Far North region. We assessed the immunization coverage and identified causes for non-vaccination.

Methods
We conducted a cross sectional study in Goulfey HD in February 2018. We administered a questionnaire to parents of 12-23 months old children, using WHO cluster survey design. Parents were asked about recommended vaccines received by their children before age of one year, reasons for non-vaccination and their perception of vaccination. Health personnel involved in vaccination were interviewed through focus groups. Evidence of vaccination was considered through vaccination card or parental declaration. Immunization coverage was determined using Penta 3 antigen, a tracker antigen for EPI. We used multivariate analysis and calculated Odds Ratio with 95% confidence interval.

Results
Information's on 629 children were collected in 30 villages. Immunization coverage was 86.5% (95%CI: 83.6-89.0) according to presentation of vaccination card and parents declaration. Of the 21.5% (103/629) with cards 99.03% (102/103) were vaccinated. Among mothers, 86.5% (534/617) found vaccination important. About 88.8% (557/627) were aware of immunization planning and 97.6% (535/548) found the vaccination planning right. Reasons associated with non-vaccination were maternal age ≥30years (OR=6.47, CI: 2.19-19.07); distance to the health facility >5km (OR=0.24, CI: 0.09-0.64), and child's residence with a non-biological parent (OR=0.12, CI: 0.06-0.27). According to health personnel, reasons of non-vaccination were parent's fear of adverse events following immunization and poverty.

Conclusion
Although vaccination is recognized as important, age and distance impact on vaccine coverage in Goulfey. Getting emphasize on the adhesion of population close to the health facility might provide improvement. Further research is needed to know the magnitude of parent's fears of vaccine adverse side effects as reported by the health staff.
Determinants and compliance of Health Care Workers update of Influenza vaccines in Fengtai District community health Center, Beijing, 2018-2019

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 300

Mr. tian liu, Mr. Zhongfa Tao, Ms. Rui Yang, Mr. Guoqin Zhang, Ms. Yinan Zhang, Ms. Jing Zhao, Ms. Ya Yu, Mr. Zhi Li, Dr. Lijie Zhang, Dr. Jian Cai, Ms. Huilai Ma

Background
Healthcare workers are at high risk of influenza infection. Therefore, immunization is recommended for all healthcare workers. Healthcare workers play a major role in influencing acceptance and uptake of vaccines. However, little is known about Influenza vaccine recommendations and compliance among healthcare workers in China.

Methods
The self-administered questionnaire was distributed to healthcare workers in Fengtai District community health Center, Beijing, 2018-2019. Face to face interviews were done among 23 directors of public health departments. The main outcome measures were personal beliefs about influenza vaccination, self-reported vaccination status, recommend vaccination status and hospital policy support for flu vaccines for healthcare workers.

Results
A total of 1359 completed questionnaires were collected, with an average response rate of 58.48%. Of these, 31.13%(423/1359) had been vaccinated against influenza. 79.76% (1084/1359) reported being willing to recommend influenza vaccination to their family, friends and patients. Factors that influence influenza vaccination rate are Departments, knowing the effectiveness of vaccines, knowing the time of vaccination, and knowing that healthcare workers are the people who recommend priority vaccination in China, and the free supply of units are factors. The main determinants of healthcare workers’ recommendations for vaccination to others are longer working years, positions for doctors or nurses, higher awareness of influenza and flu vaccine knowledge, and being vaccinated themselves during the previous influenza season. 78.26% (18/23) of the directors of public health departments believe that the flu vaccination rate was low because the flu vaccine was not free. 91.30% (22/23) of the directors suggested strengthening the flu and flu vaccine knowledge campaign to increase the flu vaccination rate.

Conclusion
Influenza vaccine coverage among Healthcare workers in Fengtai District was low. Non-free availability of vaccine was key barrier. Continuing provide free flu vaccine is necessary, and more training programs are needed in the future.
Assessment of immunization coverage in major cities of Georgia, 2015—2016

Dr. Tamta Komakhidze, Dr. Nino Khetsuriani, Dr. Mariam "Marika" Geleisvili

Background
Administrative estimates of immunization coverage in Georgia have not been validated since 2000 and are questionable due to difficulties with determining target population. We conducted survey in three major cities to assess coverage in 2014, 2013 and 2009 birth cohorts eligible for routine vaccination in 2014.

Methods
In each cohort, 1950 children (Tbilisi- 750, Batumi and Kutaisi- 600 each) were randomly selected from Civil Registry lists of children born in Georgia (linked to recently introduced Immunization Registry) to allow estimates with ±3.5% margin of error. Immunization information was obtained from clinics identified through the Immunization Registry or household visits. Coverage for diphtheria-tetanus-pertussis (DPT), measles-mumps-rubella (MMR), and polio (Pol) vaccines by city and birth cohort was assessed.

Results
Batumi: coverage was ≥95% for DTP1 (2014 cohort), DTP2 and Pol2 (2013 cohort), and DTP3, DTP4, Pol3 and MMR1 (2009 cohort); coverage for other vaccinations ranged from 76.0% to 94.4%. Tbilisi: coverage was ≥95% for DTP1 (all cohorts) and Pol1 (2009 cohort); coverage for other vaccinations ranged from 63.8% to 94.9%. Kutaisi: coverage was ≥95% for DTP1 and Pol1 (2009 cohort); coverage for other vaccinations ranged from 62.7% to 91.1%. Coverage was constantly lower for vaccinations after 12 months of age (DTP4, DT5, Pol4-5, MMR2). Delayed vaccination were common. The survey estimates were constantly lower than corresponding administrative coverage.

Conclusion
The survey revealed lower than administratively reported coverage levels. National coverage target (≥95%) was met mostly in older cohorts in Batumi and Tbilisi. Coverage was low in Kutaisi. To help achieve national target, interventions aimed at improving vaccine take-up and decreasing vaccination refusals and delays are needed. Particular attention should be paid to Kutaisi and immunizations after 12 months of age.
Situational Analysis Of Men Who Have Sex With Men And The STI Client Friendly Clinic Service in Johor 2014-2018

Dr. Jeyanthini Sathasivam, Dr. Thilaka Chinnayah, Dr. Harishah Talib, Dr. Shaharom NorAzian Che Mat Din

Background
Over the last decade, the transmission of HIV in Johor showed a major shift from Persons Who Inject Drugs (PWID) to men who have sex with men (MSM). HIV infections due to MSM reported a tenfold increase from 5% to 56% in 2011 and 2018 respectively. A situational analysis was done to describe the demography of MSM, risk behavior patterns among them and the role of current STI Client Friendly Clinic (STI-CFC) in addressing the problem.

Methods
Five years data (2014-2018) on MSM who live with HIV in Johor, Malaysia from the National AIDS Registry (NAR) were analysed for the demographics characteristic of MSM. The 2017 Integrated Biological and Behavioural Surveillance (IBBS) Survey data on MSM in Johor was used to describe their risk behavior patterns and data from the local STI-CFC was studied for the performance of the clinic in terms of utilisation and detection of cases. Data was analysed using IBM SPSS Version 24.0.

Results
The overall prevalence of HIV among MSM was 30.3% and among them 91% were below 40 years. Mean age at sex debut was 19 ± 4.3. Forty-four percent of MSM had a regular sex partner. Only 60.6% of MSM had adequate knowledge on risk and transmission. Inconsistent condom use patterns were seen among different partners ranging from 44.4% to 72.4%. The average attendance to the local STI-CFC was 13 clients a month and 87% referred by the non-governmental organization (NGO). One or two HIV cases were detected monthly.

Conclusion
This situational analysis revealed that age below 40, inadequate knowledge, inconsistent condom use and not having regular sex partners as factors to consider for targeted intervention among MSM in Johor. To address these factors, a multimodal approach was introduced to the existing STI-CFC in mid 2017. This new and comprehensive approach includes focused outreach activities, engagement of the relevant NGOs & media and personalised care for the clients.
Social, facility, and individual risk factors for poor retention in HIV care at adult HIV care and treatment clinics in Tanga and Kilimanjaro regions-Tanzania, 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 451

Mr. Boniphace Jacob, Ms. Senga Sembuche, Dr. James Gibson, Dr. Ahmed Abade, Dr. Amir Juya, Dr. Janneth Mghamba, Dr. Pamela Kohler, Dr. Katherine Wilson

Background
Despite expansion of HIV services in Tanzania, retention in HIV care is inadequate. In 2016 approximately 30% of adults are lost to follow-up by 12 months. A case-control study was conducted at district level HIV Care and Treatment Clinics (CTC) in Northern, Tanzania to assess correlates of retention in care and inform programmatic response.

Methods
Eligible participants were aged ≥18 years and enrolled at CTCs of high volume HIV treatment facilities in nine districts in Tanga and Kilimanjaro for ≥3 months by December 2016. Cases and controls were conveniently selected from clinic registers in 1:2 ratios (~30 clients per clinic) and matched on enrollment year. Cases were clients absent from CTC for ≥3 months. Controls had at least one visit in the last three months. An interview schedule was administered to collect socio-demographic, facility, and behavioral characteristics at participants’ residence (cases) and CTC (controls). Odds Ratios (OR) and 95% Confidence Intervals (95% CI) estimated associations between risk factors and case status.

Results
There were 105 cases and 210 controls. Mean age was 40.8 (SD=11.9). Most participants were female 199 (63.2%), partnered 133 (42.2%), and working 248 (78.7%). All had initiated antiretroviral therapy and the median on ARV was two years ranging from 0.03 to 19 years. Cases were significantly more likely to report fear of disclosure of HIV status (OR 2.72, 95% CI 1.58-4.69). Cases were significantly less likely to be female (OR 0.60, 95% CI 0.37-0.98) or report being satisfied with care (OR 0.14, 95% CI 0.06–0.33).

Conclusion
Perceived stigma, male gender, and low-satisfaction with care are important risk factors for poor retention at CTCs in Northern Tanzania. Strategies to reduce stigma and engage male clients may improve retention in care. Further research is needed to understand and improve satisfaction with care at CTCs.
Level and determinants of non-compliance to antiretroviral therapy among HIV-infected individuals—Kazakhstan, 2017-2018

Background
In Kazakhstan, antiretroviral therapy (ART) is offered since 2004 free of charge to HIV-infected individuals under certain medical indications. Full compliance with ART improves patients’ survival and prevents further HIV transmission and drug resistance. In 2018, we conducted a retrospective cohort study among HIV-infected individuals under treatment with the objectives to identify the level of noncompliance to ART and identify factors associated with that to provide appropriate recommendations that can improve treatment compliance.

Methods
Using the country HIV database, we identified and enrolled all HIV-infected individuals aged ≥18 years who started ART in Kazakhstan in 2017 (n=3462). The follow-up period continued until Dec 2018, or earlier if the study individuals either died or were lost to follow-up. We define noncompliance as individuals who were either lost to follow-up or who missed ≥4.5 days of ART doses per 30 days. From the HIV database, we abstracted detailed information on dates for treatment visits, number of doses prescribed, number of doses reported taken, and on potential behavioral and demographic non-compliance risk factors. We used logistic regression to assess the risk factors-noncompliance associations.

Results
Overall, 35% (1217/3462) of the studied individuals were non-compliant. The highest rates were among the following: drug users 42% (549/1296), unemployed 39% (679/1757), and those on multi-tablet regimens (≥1 tablets/day) 38% (692/1807). In multivariate analysis, the following factors were associated with noncompliance: drug use (OR=1.5, 95% CI 1.3-1.8), treatment regimens ≥1 tablets/day (OR=1.5, 95% CI 1.3-1.7), and unemployment (OR=1.4, 95% CI 1.2-1.6).

Conclusion
Non-compliance is generally high in the study group. Compliance to ART can be improved by introducing a one tablet/day treatment regimens, establishing regular contact with those under ART, and providing them with appropriate counselling, especially those unemployed and with substance abuse.
Accessibility and use of ART among South African population, 2017

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 469

Ms. Tebogo Matjokotja, Mrs. Hetani Mdose, Dr. Sizulu Moyo, Dr. Lazarus Kuonza, Prof. Khangelani Zuma

Background
In 2017, an estimated 7.9 million people were living with HIV (PLHIV) in South Africa (SA), of whom 4.4 million (56%) were receiving antiretroviral treatment (ART). Factors leading to underutilization of ART include people not knowing their HIV status, stigmatization, and socio-demographic factors. In order to achieve universal ART coverage, these factors need to be identified and addressed. We investigate the accessibility and use of ART among South Africans.

Methods
Data were analyzed from the fifth South African National HIV Prevalence, Incidence and Behaviour survey; a cross-sectional household survey conducted between 2016–2017 in SA. We analyzed factors associated with ART non-use among PLHIV. Logistic regression analysis was performed to determine the association between ART non-use and selected demographic, socioeconomic, and behavioural variables.

Results
A greater proportion of females living with HIV [65.5% (95% confidence interval (CI): 62.3–68.5)] accessed treatment than males [56.3% (95%CI: 51.0–61.5)]. Half of the children aged 0–14 years living with HIV were on ART. KwaZulu-Natal Province had the highest proportion of people accessing ART, more evident in females [71.8% (95% CI: 64.2–78.3)] than males [65.7% (95%CI: 55.3–74.8)]. On multivariate regression analysis, being aged 35–49 years [adjusted odds ratio (aOR) 3.51 (95% CI: 2.31–5.32) p<0.001] and 50–64 years [aOR 5.05 (95% CI: 2.99–8.54) p<0.001] was significantly associated with ART non-use. People living in rural areas [aOR 1.70 (95% CI: 1.26–2.29) p=0.001] were less likely to use ART compared to those in urban areas.

Conclusion
Our results suggest that despite increasing use of ART over the years, there is a gap in treatment coverage for those aged 35 years and older. There is also a need to encourage and educate people living in rural areas about the importance and benefits of knowing their status and being on treatment.
Quality HIV Counselling services are a major driver for uptake of HIV testing services among tea plantation workers in Tamteco-Toro kahuna tea estate, Uganda: Findings from a discrete choice experiment.

Ms. Martha Akulume, Ms. Susan Babirye, Dr. Simon Peter Kibira

Background
HIV Testing and Counselling (HCT) is low in heavily affected communities in sub-Saharan Africa. HIV testing options tailored to the preferences of high-risk populations may provide cost-effective means for increasing rates of testing among high-risk populations. In Kabarole district, Uganda, tea plantation workers have been identified as priority population that should be targeted by HCT services. We assessed the preferences for HCT services among tea plantation workers in Tamteco-Toro Kahuna Tea estate, Kabarole district.

Methods
A total of 348 tea plantation workers from Tamteco-Toro Kahuna tea estate participated in this study. The tea plantation workers were asked to describe the characteristics of the HCT services they preferred. We then conducted a discrete choice experiment in order to quantify their HCT preferences. The HIV testing options were described by a number of key characteristics including; testing venue, type of sample, type of counselling, who administers the test and when the test is done. The respondents were then presented with a series of choice tasks in which they chose their preferred options. We analysed the data using STATA version 14.

Results
We found that the HCT aspect that was valued most by tea plantation workers was counselling (n=191, 51.1%). About 40% of the tea plantation workers mentioned that they preferred to obtain HCT services from government facilities while majority (n=339, 89.5%) stated that they preferred the samples to be collected through finger prick. The results from the discrete choice experiment showed that samples taken from the arm (OR=1.22, P-Value=0.017) and any counselling (pre-test counselling OR=1.87, P-Value=0.000; post-test counselling OR=1.42, P-Value=0.000 and both pre-test and post-test counselling OR=1.86, P-value=0.000) increased the odds of a participant selecting a testing option, with the greatest for variables relation to type of counselling

Conclusion
Tea plantation workers preferred HCT options that comprised of any form of counselling. Therefore, in order to increase uptake of HCT services, quality counselling should be provided to tea plantation workers.
Factors Associated with Willingness to Use Mobile Phone Technology Interventions for Medication Adherence among HIV-Positive Patients Attending a Tertiary Hospital – Nigeria, 2018

Dr. John Olujide Ojo, Dr. Muhammad Shakir Balogun, Prof. Olufunmilayo Fawole, Prof. Magbagbeola D Dairo

Background
There is growing evidence supporting mobile phone technology assessment and intervention to improve antiretroviral therapy (ART) adherence. Also, there is a critical need to improve ART adherence among persons with HIV infection. We, therefore, assessed willingness to use mobile phone technology interventions (MPTI) to improve ART adherence among persons with HIV infection.

Methods
We conducted a cross-sectional survey using a systematic random sampling technique to select 237 HIV-positive patients attending adult HIV clinic at Federal Teaching Hospital, Ido-Ekiti between January and April 2018. We used a 33-item semi-structured interviewer-administered questionnaire to collect data on ownership, utilization, and willingness to use MPTI to enhance adherence to HIV medication. We analyzed data using descriptive statistics and multivariate logistic regression at 5% level of significance.

Results
Majority of respondents 233 (98.3 %) owned a cellphone, and 168(70.9 %) were willing to receive MPTIs on medication adherence. Respondents who were aged 60 years and above (AOR=0.05, 95%CI: 0.01-0.24) were less likely to be willing to use MPTI to enhance ART adherence than those who were less than 40 years old. Respondents with tertiary education (AOR=7.12, 95%CI: 3.01-16.53) were more likely to be willing to use MPTIs to enhance medication adherence than those without formal education. Respondents that had been diagnosed more than 10 years ago (AOR=15.63, 95%CI: 3.02-80.83) were more likely to be willing to use MPTIs to enhance ART adherence than those diagnosed less than two years ago

Conclusion
High proportions of HIV-positive patients had a cell phone and were willing to use it as a medication reminder. There is a need to incorporate MPTIs in strengthening adherence among all HIV-infected as they have shown they are open to employing these strategies in the management of their illness. Findings and recommendations were shared with the caregivers, the hospital management and supporting organizations.
Assessment of HIV Exposed Infants on Follow Up at Mentor Mothers Program Sites in Kwale County - Kenya, 2016–2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 397

Mr. Juma Mwavita, Dr. Elvis Oyugi, Dr. Esther Kisangau, Mr. Juma Ahmad, Dr. Zeinab Gura

Background
Mentor mother’s program (MMP) was initiated to accelerate elimination of mother to child transmission (eMTCT) of HIV by addressing psychosocial challenges faced by mothers living with HIV in Kenya. In 2016, rate of mother-to-child transmission of HIV (MTCT) was 22% in Kwale County, higher than Kenya’s national rate of 8.3%. We characterized HIV Exposed Infants (HEIs) and mothers on follow up in the MMP.

Methods
We reviewed records of mothers on follow up at seven MMP sites in two Sub-Counties in Kwale county, from 2016 to 2018. Data were extracted from the MMP register and variables assessed were socio demographic characteristics, mother’s HIV status at first visit, male partners’ HIV status and HEI outcome at 18 months. Descriptive statistics were calculated using MS Excel. We used a standardized tool to conduct data quality audit.

Results
We reviewed 300 records; mean age was 29 years (±5.8 years), 61% (184/300) resided in Matuga Sub-County, 99% (296/300) were married, 74% (223/300) were living with HIV at enrollment, 82% (246/300) had a male partner who was living with HIV and 19% (56/300) were accompanied by their male partner to the MMP clinics. Of 300 infants born alive, 5% (16/300) were not delivered in a health facility and 94% (283/300) received Nevirapine infant prophylaxis, 90% (270/300) were tested by polymerase chain reaction at 6 weeks and 83% (249/300) had ELISA test at 18 months. After 18 months follow up for HEI, 72% (216/300) tested negative to HIV while 4% (12/300) tested positive, 3% (9/300) died and 21% (63/300) were lost to follow up.

Conclusion
The MTCT of HIV in the MMP sites was lower than the county average, however, there is need to strengthen defaulter tracing and improve infant care to reduce the loss to follow up and early deaths.
Measles Outbreak in Kamukunji Sub-County, Nairobi County - Kenya, 2018

Tuesday, 29th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 348

Dr. Maryanne Gachari, Mr. Tura Galgalo, Mr. Robert Rotich, Dr. Ali Noor, Mr. Richard Kihara, Dr. Jack Irungu, Dr. Zimy Wansaula, Dr. Meredith Dixon, Dr. Jane Githuku, Dr. Elvis Oyugi, Dr. Zeinab Gura, Dr. Christie Reed

Background
In early 2018, measles outbreaks began in rural Kenya. In August 2018, cases were laboratory-confirmed in urban Kamukunji Sub-county, home to a large migrant, refugee population, with first-dose measles containing vaccine (MCV1) and second-dose measles containing vaccine (MCV2) coverage of 73% and 35% respectively in 2017. We conducted an epidemiologic investigation to inform control efforts.

Methods
We reviewed health facility registers and interviewed community health workers regarding sick children residing near confirmed cases, including a boarding school. A suspected case was an illness with fever, maculopapular rash, and cough, coryza or conjunctivitis or one where a clinician suspected measles, in any person living or visiting Kamukunji during January 1–October 3, 2018. A confirmed case was measles immunoglobulin M (IgM) antibody positive, not induced by vaccination; epidemiologically linked to a laboratory-confirmed case without specimen; or clinically compatible without epi-linkage or adequate specimen collected. We interviewed cases or their guardians using a structured questionnaire. We collected serum samples for IgM antibody detection by enzyme-linked immunosorbent assay (ELISA) and nasopharyngeal samples for measles virus RNA detection by real-time polymerase chain reaction (RT-PCR) and genotyping by sequencing the detected virus. We calculated descriptive statistics and attack rates by various categories.

Results
During January–October, 2018, we identified 67 confirmed cases [52 (78%) epi-linked and 15 (22%) laboratory-confirmed]; 28 (42%) from the community and 39 (58%) from health facilities. Of the confirmed cases, 43 (64%) were male; 39 (58%) were aged <5 years and 10 (15%) were aged <9 months (range: 3 months–19 years). The highest attack rate was 15 per 10,000 in children <1 year. Only 15 (28%) of 53 cases eligible for MCV1 had received it; and only nine (29%) of 31 cases eligible for MCV2 had received it. Of 16 blood samples collected, 10 (63%) were positive for measles IgM antibodies. Measles virus genotype B3 was detected in five (71%) of 7 nasopharyngeal samples collected.

Conclusion
This outbreak occurred among under-vaccinated children in an urban sub-county. Children aged <1 year had highest attack rates, illustrating the importance of providing two doses of MCV to eligible children in order to protect those most vulnerable.
Influenza A (H1N1)pdm09 outbreak in a Senior High School, Greater Accra Region, Ghana-2018

Mr. Oxygen Gershion Wullar, Dr. Donne Ameme, Ms. Delia Bando, Dr. Ernest Kenu

Background
Though usually seasonal in temperate climates, influenza occurs throughout the year in the tropics with outbreaks occurring at irregular intervals. On February 6, 2018, a number of students from a Senior High School (SHS) in Accra reported to a district hospital with cough, fever and other respiratory symptoms. An influenza-like illness (ILI) outbreak was suspected. We determined the magnitude, source of the outbreak and implemented control and prevention measures.

Methods
We conducted a retrospective cohort study. We defined ILI case as “any person in the SHS with fever (measured axillary temperature of ≥ 37.5 °C or history of fever) and cough with or without sore throat from January 21, 2018”.

We reviewed health records and conducted active case search to identify more cases, collected data on demographic characteristics and clinical features. Oropharyngeal samples for laboratory testing were done. We performed descriptive and calculated attack rate ratios (ARR) and their corresponding 95% confidence intervals (CI).

Results
We confirmed influenza A (H1N1)pdm09. The overall attack rate was 3.3% (104/3160) from January 25 to February 13, 2018. Sex specific attack rates were 5.6% (74/1331) and 1.6% (30/1829) for males and females respectively. Mean age of case-patients was 16.1 (±2.3) years with males constituting 51% (74/104). Compared to females, males were more likely to be ill [ARR =3.4; 95% CI: 2.2- 5.2]. No case was reported within three weeks after a scheduled four-day mid-term break on February 13, 2018.

Conclusion
Influenza A (H1N1)pdm09 outbreak occurred in a SHS in Accra from January to February, 2018. Even though source of outbreak could not be determined, outbreak was controlled by prompt case management and health education on hand and personal hygiene. Scheduled mid-term break probably contributed to the outbreak control.
Session A: Animal Health; Moderators: David Castellan, Innocent Rwego; Wednesday, 30 October 2019, 10:30am; Venue: Dogwood
Fatal Rift Valley Fever Outbreak Caused by Exposures to Meat from Sick and Dead Livestocks: Uganda, July 2018

Ms. Angella Musewa, Ms. Doreen Birungi, Ms. Bernadette Basuta Mirembe, Ms. Esther Kisaakye, Dr. Benon Kwesiga, Mr. Stephen Ndugwa Kabwama, Dr. David Muwanguzi, Dr. Deo Birungi Ndumu, Mr. Stephen Balinandi, Dr. Bao-Ping Zhu, Dr. Alex Riolexus Ario

Background
Rift Valley Fever (RVF) is a viral hemorrhagic fever that can be fatal to humans and livestock. During June-October 2018, RVF cases sharply increased in eight western and central Ugandan districts. We investigated to identify scope of outbreak and exposure factors, and recommend control measures.

Methods
We defined a probable case as acute onset of unexplained fever with thrombocytopenia or leukopenia, plus ≥1 of: unexplained bleeding, blurred vision, or unexplained death during June–October 2018 in a resident of affected districts. A confirmed case was a probable case with a positive serum test for RVF by RT-PCR. We reviewed medical records and actively searched for cases in communities. In a case-control study, we compared exposures of cases and age-, sex-, and neighbourhood-matched controls. We reviewed livestock RVF surveillance data.

Results
We identified 19 cases (17 confirmed, 2 probable); 13 (68%) of 19 died. The attack rate (AR) was 19 times higher in males (8.7/1,000,000) than in females (0.46/1,000,000). Of the 18 case-patients and 90 controls included in the case-control study, 10 case-patients (56%) out of 18 and 7 (7.8%) of the 90 controls had butchered/carried sick/dead livestock (OR\textsubscript{MH}=23, 95%CI=4.6-109). Exposure to raw meat from healthy livestock was not significantly associated with RVF (OR\textsubscript{MH}=3.3, 95%CI=0.36-31). RVF seropositive animals (72%) were identified in serum samples taken from livestock on farms where human cases had occurred.

Conclusion
The point-source outbreaks were caused by handling raw meat of sick/dead livestock. Stratified epidemic curves indicated multiple point-source outbreaks following butchering livestock that had been sick or died of unknown causes. RVF infection occurred in livestock on affected farms. We recommended frequent veterinary inspection of livestock carcasses before butchering. RVF surveillance data between human and livestock health sectors should be shared to facilitate early warning and detection for RVF.
Investigation of Anthrax Outbreak in Human - Nzoka village, Songwe Region Tanzania, 2019

Background
Anthrax outbreaks in Tanzania have been reported from the human, livestock and wildlife sectors over several years. On 5 January 2019, regional authorities at Songwe region reported 52 suspected human cases (4 deaths) of anthrax disease in Nzoka village, Momba district in Songwe region. The outbreak affected four settlements; Chipanda, Nzoka, Manyoro and Kanyimbo. The outbreak was preceded by the deaths of 16 cows. We investigated to describe the outbreak and institute control and preventive measures.

Methods
We identified suspected cases through a visit to Nzaka Dispensary where suspected cases were reported from 24 December 2018 – 07 January 2019 in the existed line-list. A suspected case was defined as any resident of Nzoka village with skin lesion, black eschar accompanied by oedema, history of eating and/or contact with sick/dead cattle. Four swab specimen of the skin lesions were obtained from four initial suspected case-patients and analyzed. We interviewed seven suspected cases at their homes using a structured questionnaire to assess risk factors for illness. Seven blood samples were collected from suspected human cases by qPCR. Data were analyzed and summarized for frequencies and proportions using Ms Excel.

Results
Of 81 suspected human cases, 4 died (CFR: 4.9 %). The median age was 25 years (range 1-75). Females were the most affected (Attack rate:0.9). Out of four settlements, Chipanda and Nzoka were the most affected (attack rate 0.6% and 0.5% respectively). Majority 49(61%) were managed by penicillin G injection. Seven cases interviewed had history of consuming and/or handled diseased/dead cattle. The peak of an outbreak was noted on 5th January 2019, with a decline thereafter. Two (2) out of four swab samples collected showed gram positive bacilli. Three (3) samples out of 7 human samples, confirmed positive for anthrax by PCR. As of 16 Jan 2019, 1451 out of 221,219 domestic animals were vaccinated.

Conclusion
The outbreak at Nzoka village was confirmed to be caused by anthrax. We recommended active case-finding by community health workers, continuing provision of health education to the community, animal vaccination against anthrax and strengthening surveillance system to detect, investigate and confirm the outbreak in a timely manner.
Investigation and Response to Dog Bites and Suspect Cases Rabies - Batouiri Health District, East Cameroon, 2018

Wednesday, 30th October - 11:10: Session A: Animal Health (Dogwood) - Oral - Abstract ID: 75

Dr. Henri Magloire BOFIA BOYOGUENO, Dr. Annie Marielle MENGUE ESSINDI, Dr. Rose-Carole BOHIMBO M., Dr. Serge SADEUH, Dr. Georges Alain ETOUNI MBALLA

Background
La rage, une zoonose virale est mortelle après l’apparition des symptômes. Au Cameroun, la confirmation de 2 cas humains (CC) en 2016 dans la région centrale par le Centre Pasteur du Cameroun montre que le risque de contracter la rage reste élevé. L’absence de système de surveillance sentinelle efficace et les contraintes socioculturelles font que les données fragmentées actuelles ne permettent pas d’estimer le poids de la rage sur la santé humaine et animale. Le 28 Décembre 2017, un cas suspect (SC) de la rage et 21 morsures de chiens ont été signalés au ministère de la santé publique du domaine de la santé Belita 2 (BHA), district sanitaire Batouiri au Cameroun oriental. Une équipe multidisciplinaire a été déployée pour enquêter et répondre à ces informations.

Methods
We conducted a cross sectional study. We actively search exposed human (EC) and animal rabies SC’s in the community during a one-week period. We reviewed medical records from health facilities, and dog vaccination records from zoo technical and veterinary centers in BHA. An EC of rabies was a person bitten, scratched or licked by an animal between 20th October 2017 and 4th January 2018 in BHA. A SC was any EC presenting with headache, agitation, hydrophobia or fever. CC was any SC with a positive test from CPC. We determine proportions.

Results
Forty EC were identified, 70% (28/40) resided in NYABI village (BHA). Among the EC, 70% (28/40) were male and 37% (15/40) were ≤15 years old. Three SC of rabies were recorded. CFR was 100% (3/3), with one post-mortem CC. All EC were bitten by dogs (100%) of which, 97, 5% (39/40) was not vaccinated. Review of canine vaccination records in BHA revealed that dogs were unvaccinated for rabies. A rabies awareness campaign was done in community and hospital during a week. Post-exposure prophylaxis (PEP) was administered to 76% (29/38) of EC and all dogs were vaccinated in BHA. No further EC was recorded in BHA later on.

Conclusion
Rabies was confirmed in the BHA and likely spread from the local unvaccinated dogs. PEP with sensitization campaigns and dog vaccination, might be suitable control measures to limit the spread of this epizootic.
Case-Control Study of Gastrointestinal Anthrax, Cayapa Village, Lagangilang, Abra, Philippines, March 2017

Wednesday, 30th October - 11:30: Session A: Animal Health (Dogwood) - Oral - Abstract ID: 231

Ms. Karen Lonogan, Dr. Alethea De Guzman, Dr. Vikki Carr de los Reyes, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Background
On March 21, 2017, FETP team was sent to Cayapa Village, Abra due to increasing cases of foodborne illness. Epidemiologic investigation was conducted to verify the diagnosis, establish existence of outbreak, identify risk factors, and recommend control and prevention measures.

Methods
We conducted a 1:2 case-control study. A suspect case was a previously well resident of Cayapa Village who developed abdominal pain or diarrhea and one of the following: fever, vomiting, sore throat, difficulty swallowing, lymphadenopathy from February 27-March 14, 2017. Confirmed case was a suspect case positive for *Bacillus anthracis* on bacterial culture or rt-PCR test. A control was a well resident negative for *Bacillus anthracis*. We collected serum specimens and soil samples for laboratory confirmation. We conducted environmental survey and key informant interview. We used Stata ver.13 to analyze data.

Results
Twenty-nine suspect cases were identified. All ate meat of dead water buffalo. Majority (15, 52%) were males. Age range from 6-77 years (Median: 17). Clinical manifestations were abdominal pain (26, 90%), fever (16, 55%), and diarrhea (14, 48%). One (3%) had lymphadenopathy. Interview revealed that a dead water buffalo was butchered and sold amongst the villagers. All 11 serum specimens and five soil samples were negative for *Bacillus anthracis*. After multivariate analysis, eating uncooked meat of dead animal (Adj.OR=6, 95% CI:1.7-18.4) was a risk factor.

Conclusion
The epidemic curve indicates a point source outbreak of gastrointestinal Anthrax. We found valid statistical and temporal association of eating by-product of dead carabao and gastrointestinal Anthrax. The clinical manifestations were consistent with *Bacillus anthracis* rather than other foodborne bacterial pathogens. Hence, we conducted massive information education campaign sick or dead animal by-product should not be sold or eaten and properly handled and disposed.
Session B: Anti-microbial Resistance and Healthcare-related Topics; Moderators: Michael Gronostaj, Matt Mikoleit; Wednesday, 30 October 2019, 10:30am; Venue: Cherry
Occurrence and antimicrobial susceptibility patterns of Escherichia coli isolates from raw meat in Ghana-2019

Wednesday, 30th October - 10:30: Session B: Anti-microbial Resistance and Healthcare-related Topics (Cherry) - Oral - Abstract ID: 248

Dr. Esther Dsani, Dr. Donne Ameme, Dr. Ernest Kenu, Dr. Samuel Sackey, Dr. Beverly Egyir, Prof. Edwin Afari

Background
Antimicrobial resistance (AMR) is a major threat to public health and more critical in zoonosis. Food producing animals (FPA) are major reservoirs for food-borne pathogens which may be resistant to critically needed antimicrobials in human and veterinary medicine. Occurrence of pathogenic Escherichia coli (E. coli) strains in FPA and their resistance to antibiotics in both human and animals is of utmost concern. We determined the prevalence of E. coli in raw meat from FPA and characterized the antimicrobial susceptibility patterns.

Methods
We collected swabs from beef, mutton and chevon from three slaughter houses in Greater Accra Region of Ghana, transported them in peptone water to the laboratory within 2 hours for culture and sensitivity. E. coli isolates were identified by colony morphology and confirmed by MALDI-TOF analysis. We performed antimicrobial susceptibility testing by Kirby Bauer disk diffusion method, using 11 antimicrobial agents commonly used in human and veterinary medicine. We observed slaughter practices. Descriptive statistics was used to characterize antimicrobial susceptibility patterns.

Results
Overall, prevalence of E. coli was 48% (98/205) in all meat types sampled. Antimicrobial susceptibility testing showed that isolates exhibited resistance to Ampicillin (57%, 56/98), Tetracycline (45%, 44/98), Sulfamethoxazole-Trimethoprim (21%, 21/98), Cefuroxime (17%, 17/98), Ciprofloxacin (8%, 8/98) and Cefotaxime (2%, 2/98). All the isolates were susceptible to meropenem. Resistance to three or more antimicrobial drugs was found in 22% of the isolates. Water supplies, sanitary facilities and equipment at all sites were found to be inadequate. Slaughterhouse workers were seen moving meat and equipment from dirty to clean areas.

Conclusion
Contamination with E. coli was found to be high in raw meat from FPA. Multi-drug resistant E. coli including resistance to third generation cephalosporins was present in meat. Suboptimal slaughter practices might have facilitated contamination. Slaughterhouse workers and health workers were educated and strict hygiene practices implemented in the slaughterhouses.

Wednesday, 30th October - 10:50: Session B: Anti-microbial Resistance and Healthcare-related Topics (Cherry) - Oral - Abstract ID: 332

Ms. Marvellous Mhondoro, Mr. Nqobile Ndlovu, Mr. Donewell Bangure, Ms. Tsitsi Juru, Dr. Notion Gombe, Dr. Gerald Shambira, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Background
In 2017, World Health Organisation published a list 12 priority-bacteria, which require surveillance because they are resistant to antibiotics. Data from a private laboratory in Harare revealed increasing resistance rates to common antibiotics like ampicillin (73.9% in 2011 to 74.6% in 2015). The increasing resistance rates indicate that antimicrobial resistance (AMR) affects Zimbabwe. We determined the magnitude and trends of AMR to commonly used and last-resort antibiotics.

Methods
We conducted a retrospective record review on data collected from a private microbiology laboratory, which is the largest in Zimbabwe with capacity to screen microorganisms to species level and has a constant supply of antibiotic discs compared to public laboratories. The outcome of interest was the antimicrobial susceptibility test result of the isolates. We used Microsoft Excel 2016 to plot trends from 2012 to 2017. Statistical significance was determined by simple linear regression using Epi Info™7.

Results
We analysed 23 432 isolates, of 12 medically important bacteria. Of the isolates, analysed 43.4% were from urines, 36.7% from pus-swabs and 7% from blood specimens. The most common pathogen was E. coli (43.2%), followed by Staphylococcus aureus (15.8%) and the least common was Neisseria gonorrhoeae (0.2%). Resistance by all bacteria was highest to ampicillin followed by penicillin, both ranging between 70% and 100% over the 6 years. Increases in resistance to commonly used antibiotics were observed in amoxicillin-resistant Escherichia coli ($R^2=0.98; \ p<0.01$), Streptococcus pneumoniae ($R^2=0.83; \ p<0.01$) and 3rd generation cephalosporin-resistant E. coli($R^2=0.89; \ p<0.01$). Increasing resistance trends were also seen in last-line antibiotics i.e., fluoroquinolone-resistant Salmonellaspp, carbapenem-resistant Pseudomonas aeruginosa and Acinetobacter baumannii. However, a decreasing resistance trend was noted in methicillin-resistant S. aureus.

Conclusion
There is a high burden of drug resistance to common antibiotics, which include priority organisms in Harare, and an emergence of resistance to last-line antibiotics. We recommend development of robust nationwide surveillance for monitoring priority-organisms for identification and treatment before spread.
Outbreak Investigation of Extensive Drug Resistant Typhoid Fever - Hyderabad, Pakistan 2017

Dr. Mudassar Hussain, Dr. Santosh Kumar, Dr. Munaza Qadri, Dr. Sandeep Kumar, Dr. Naveed Memon, Dr. Musa Raheem, Dr. Mirza Amir Baig

Background
Since 2016, Pakistan is experiencing the world’s largest outbreak of extensive drug resistant – typhoid fever (XDR-TF). On 9th January 2017, Directorate General Health Services, Sindh received a report of 14 confirmed cases of XDR-TF from Hyderabad District. FELTP fellows were deputed to investigate the outbreak and implement control measures.

Methods
A case was defined as, clinically diagnosed typhoid fever with culture confirmed Salmonella enterica serotype-typhi; demonstrating resistance to first line drugs, fluoroquinalones and third generation cephalosporins, in a resident of District-Hyderabad between 10th November 2016 to 31st December 2017. Active case finding was carried out in the affected areas. A case control study was conducted. Controls were culture positive typhoid fever patients showing sensitivity to first line drugs from the same areas. Environmental assessment was done and water samples sent to Aga Khan University Hospital Lab for microbiological analysis.

Results
Of total 1,378 suspected cases (465 by active case finding), 629 (46%) were confirmed XDR-TF, however 438 (69%) consented and were enrolled. Median age was four years (range 1-55 years) and 60% were males. Overall attack rate was 2 per 10,000 population and the most affected age-group was 2-4 years (AR=11/10,000). Of the 438 cases 32% consumed water from community filter plants (aOR:3.6; 95%CI=2.4-5.4), 41% reported presence of open sewage lines around their house (aOR:3.0; 95%CI=2.2-4.3) and 39% reported dilapidated water lines in their neighborhood (aOR:2.9; 95%CI=2.1-4.1). Environmental assessment revealed pipelines with unauthorized punctures and leaks with illegal vacuum suction. Of the 55 water samples 12 were positive for Salmonella typhi DNA strands on PCR testing.

Conclusion
Consumption of contaminated water was the most probable cause of the outbreak. Sewage contamination of drinking water contributed to the spread. Chlorination with repair of the filtration plants and supply lines was proposed. A typhoid-vaccination-campaign was started from August-2017.
Factors associated with Multidrug-resistant Tuberculosis in Rwanda: Secondary data analysis of the Rwanda 2015 Drugs Resistance Tuberculosis Survey

Wednesday, 30th October - 11:30: Session B: Anti-microbial Resistance and Healthcare-related Topics (Cherry) - Oral - Abstract ID: 527

Dr. Byiringiro Rusisiro, Dr. Patrick Migambi, Dr. Yves Mucyo, Prof. Joseph Ntaganira

Background
Multidrug-resistant tuberculosis (MDR-TB) is a major threat for TB control globally. The Rwanda 2005 drugs resistance tuberculosis survey revealed that 3.9% of new TB patients and 9.4% of previously treated TB patients had multidrug-resistant tuberculosis. We used data from the 2015 follow-up drugs resistance TB survey to determine the prevalence and risk factors of multidrug-resistant tuberculosis in Rwanda.

Methods
This study involved secondary data analysis of the Rwanda 2015 drugs resistance tuberculosis survey. During the primary study, all patients with sputum smear-positive TB from all health facilities across the country were enrolled, over a period of six months from 26th January to 15th July 2015. Socio-demographics and clinical information were collected using a standard questionnaire. Drug susceptibility testing was performed to identify MDR-TB strains using Line Probe Assay and phenotypic techniques. MDR-TB was defined as TB due to Mycobacterium tuberculosis that is resistant to isoniazid and rifampicin with or without resistance to other drugs. We abstracted and analyzed data using Stata 13: conducting bivariate and multiple logistic regression to identify potential risk factors. P-values < 0.05 were considered as statistically significant.

Results
Of the 1,221 smear-positive sputum specimens, Mycobacterium tuberculosis grew from 1,117(91.4%). Drug susceptibility testing revealed that 1,094 (97.9%) were susceptible, while 23 (2.1%) were confirmed with MDR-TB strains. The overall prevalence of MDR-TB was 2.1% (1.4% among new cases and 10.7% among previously TB treated cases). Among the HIV infected patients, 5.4% (11/205) had MDR-TB compared to 1.4% (12/912) among HIV negative patients [aOR=3.4 (95% CI: 1.4-8.07)]. Eleven percent (9/84) of previously treated TB patients had MDR-TB compared to 1.4% (14/1033) among new TB cases [aOR=7.2 (95% CI: 2.9-17.5)].

Conclusion
We identified HIV infection and previous TB treatment as probable risk factors of MDR-TB in Rwanda. We recommended the strengthening of active surveillance of drug-resistant TB in these high-risk groups to allow timely detection and control. Following this study, systematic screening of HIV infected people and persons with history of TB has been revamped. GeneXpert test is used for the initial exam and then molecular testing done to detect MTB Rifampicin resistance.
Invasive Group A Streptococcus Infections Among Residents of Multiple Nursing Homes—Denver, Colorado, 2017–2018

Wednesday, 30th October - 11:50: Session B: Anti-microbial Resistance and Healthcare-related Topics (Cherry) - Oral - Abstract ID: 547

Dr. Osatohamwen Idubor, Mrs. Nisha Alden, Ms. Helen Johnston, Ms. April Burdorf, Ms. Devra Barter, Dr. Ariella Dale, Ms. Alana Cilwick, Ms. Janell Nichols, Mr. Geoff Brousseau, Dr. Alexis Burakoff, Dr. Wendy Bamberg, Dr. Rachel Herlihy, Dr. Heather Reese, Dr. Sukarma Tanwar, Mr. Wycliffe Odongo, Dr. Abimbola Ogundimu, Dr. Nimalie Stone, Dr. Srinivas Nanduri, Dr. Sopio Chochua, Dr. Chris Van Beneden

Background
Older adults residing in nursing homes (NH) are at increased risk for invasive group A Streptococcus (GAS) infections due to advanced age, presence of wounds, and comorbidities; approximately one third of infected patients die. Beginning in 2015, increasing numbers of GAS infections in NH residents and several NH clusters were reported from the Denver metropolitan area. Colorado Department of Public Health & Environment (CDPHE) and CDC investigated to characterize cases and assess if outbreaks resulted from interfacility transmission.

Methods
We reviewed data from Active Bacterial Core surveillance (ABCs) in the 5-county Denver area from January 2017–June 2018. We defined a case as isolation of GAS from a normally sterile site in a NH resident. GAS isolates underwent whole-genome sequencing (WGS) at CDC's Streptococcus Laboratory to determine emm types for genotyping. Among isolates with the same emm type, pairwise single nucleotide polymorphism (SNP) distances were calculated using Nucmer software. In October 2018, a CDPHE-CDC team assessed infection control at NHs with cases of the most common emm type.

Results
Over 18 months, among >100 NHs in the Denver area, ≥1 GAS case was identified in 29 NHs, with 6 having ≥3 cases. During this period, 68 cases in NH residents were identified. WGS identified 17 emm types among isolates from these cases; most common was emm11.10 (34%, n=22), a rare subtype in ABCs. All emm11.10 isolates had nearly identical genomes (average pairwise SNP distance: 3.2), and were isolated from 10 NHs, with 2 NHs having ≥4 cases. Multiple infection control lapses were noted during site visits to 8 NHs.

Conclusion
Multiple outbreaks due to GAS were noted in 5-county Denver area NHs in 2017–2018. WGS of surveillance isolates identified a rarely seen emm subtype 11.10 from multiple facilities with temporal and genomic clustering suggesting interfacility GAS transmission.
Access for Public Health Care of refugees and migrants in Rabat, Morocco 2018

Background

International migrations have become subject of interest worldwide. As Morocco has become a migration host country, with around 40 000 migrants and refugees, and has developed a migrant health strategy since 2014. The obligation to reach the right to health for migrants has often been overlooked. This study aims to measure access of migrants and refugees to healthcare structures and the encountered issues in area of Rabat in Morocco.

Methods

A cross sectional Study was conducted between January and June 2018. All migrants located in Rabat City who gave their consent and attending the three active local NGOs in Rabat city were included. Information regarding socio-demographic status and access to different levels of healthcare facilities were collected by face-to-face questionnaire.

Results

A total of 204 migrants participated in the study. Average age was 28.7±9 years. Gender ratio Men/Women: 1.9/1. The half of migrants is from Guinea Conakry, Democratic Republic of Congo and Cameroon. Health insurance coverage was 2%. More than 90% of migrants asked for care in health facilities, 76.6% of them were assisted by an association. They practiced self-medication in 28.9%. The access was different at the 3 levels; 81.4% accessed to primary level, 24.5% to secondary level and 41.7% to tertiary level. According to the perception of migrants; 62.1% of the participants declared that the right of access to healthcare facilities was very limited. Communicational problems with facilities staff (51/67) In Primary level and the payment of services (15/32) in tertiary level were the main problems that migrants faced.

Conclusion

To access at health care, the migrants and refugees still face many constraints related to the communication and the payment of benefits at secondary and tertiary levels. It's recommended to implement an agreement framework of health coverage with the participation of different stakeholders', to train health professionals on the specific migrants take in care and inform the migrants on their right to access to healthcare facilities.
Session C: Chronic Disease and Injury; Moderators: Ann Dellinger, Bao-Ping Zhu; Wednesday, 30 October 2019, 10:30am; Venue: Poplar
Geospatial distribution of pedestrian injuries and associated factors in the greater Kampala Metropolitan area, Uganda

Mr. Frederick Oporia, Prof. Nazarius Mbona Tumwesigye, Dr. John Bosco Isunju, Ms. Rebecca Nuwamatsiko, Dr. Abdulgafoor Mahmood Bachani, Ms. Angela Kisakye, Ms. Mary Nakafeero, Mr. Fiston Muneza, Dr. George Kiwanuka, Dr. Nino Fachiadze, Dr. Olive Kobusingye

Background
In Uganda, pedestrians constitute the largest proportion (43%) of road traffic injuries. Over 52% of these injuries occur in the Greater Kampala. However, information on geospatial distribution of road traffic injuries involving pedestrians and associated factors is limited. We determined the geospatial distribution of pedestrian injuries and associated factors in Greater Kampala Metropolitan Area, Uganda.

Methods
We conducted a cross sectional study using a structured questionnaire to interview 332 injured pedestrians at ten health facilities in the three districts of Greater Kampala from 1st/05/2017 to 31st/07/2017. We defined injured pedestrian as a person who was knocked by a motorcycle/vehicle while moving on foot along the road. We used a context modified Australian Walkability Audit Tool to assess road characteristics at the reported injury locations (outcome). The outcome was categorized into three according to primary land use: ‘residential areas’, ‘commercial/business areas’ and ‘bars/entertainment areas’. Injury hotspots were mapped out using Quantum Geographic Information System to generate heat maps and multinomial logistic regression was used to determine adjusted prevalence ratios (APR) at 95% confidence interval.

Results
Males represented 66.5% (221/332) of the sample. Pedestrian injuries were highest among 15-29-year-olds, 45.5% (151/332). In this 3-months study period, most 47.2% (157/332) injuries occurred in commercial/business areas. Places that had the most pedestrian injuries were Namasuba-Zana, 13% (43/332) followed by Nakawa-Kireka on Jinja road, 9.7% (32/332). Presence of speed humps was protective (APR=0.13, 95%CI 0.01-0.93). However, pedestrians at zebra crossings (APR=6.41, 95% CI: 1.14-36.08) and clear roads with no traffic congestion (APR=6.39, 95%CI: 2.75-14.82) were most likely to be injured.

Conclusion
Similar to some studies, our findings show that pedestrian injuries mostly occur in business and entertainment areas. These findings also show that speed humps are safer for pedestrians, but zebra crossings and clear roads with no traffic jam have a more than 6-fold risk for injuries. There is need for sensitization of motorists to respect zebra crossings and construction of speed humps in markets and other business areas.
Prevalence of Pre-Diabetes among Saudi Male Adults Attending Primary Health Care Centers- Makkah City- Saudi Arabia, 2019

Wednesday, 30th October - 10:50: Session C: Chronic Disease and Injury (Poplar) - Oral - Abstract ID: 215

Dr. Jalal Mzjaji, Prof. Randa Nooh, Dr. Ayman Mzjaji, Dr. Hossam Al-Esawi, Dr. Ahmad Alowfi

Background
Prediabetes is a significant risk factor for type 2 diabetes, with a 5-10% annual conversion rate to diabetes. The current prevalence of type 2 diabetes in Saudi Arabia is 32.8%, predicted to rise up to 45.8% by 2030. The aim of this study is to determine the prevalence of pre-diabetes and its associated risk factors among Saudis attending Primary Health Care Centers (PHCC) in Makkah city, Saudi Arabia.

Methods
We conducted a cross-sectional study of Saudi males aged 18 years and above, visiting a PHCC in Makkah over a one-month period. We directly interviewed respondents using Arabic translation version of the Canadian Diabetes Screening Tool to assess risk factors, such as family history of diabetes, smoking, food habits, physical activity. Anthropometric measurements were taken along with laboratory assessment of Glycated hemoglobin (HbA1C). Pre-diabetes was defined according to the American Diabetes Association criteria, as: Hemoglobin A1C (HbA1C) level of 5.7-6.4%.

Results
The total number of participants was 222, with a mean age of 39.9 years (Standard Deviation ±11.8). Sixty participants 27% were diagnosed as pre-diabetics, of whom 46.7% were 18–44 years old, 58.6% were obese or overweight; 18.9% had a waist circumstance (WC) over 102 cm, 50% had high blood pressure, 60% had a family history of diabetes, 23% were smokers, 72% did not consume vegetables and fruits daily, and 60.4% were physically inactive. We found a moderate positive correlation (r = 0.597) between HgA1C and diabetes risk score with an area under the curve of 0.751, with 80% sensitivity and 66% specificity at a cut off value of 24.5. After adjusting for other variables, statistically significant risk factors for pre-diabetes were being married, older age, family history of diabetes, and WC over 102 cm.

Conclusion
We found a high prevalence of pre-diabetes and associated risk factors. We recommend using this non-invasive, inexpensive and safe screening tool to identify Saudis at high risk of prediabetes.

Wednesday, 30th October - 11:10: Session C: Chronic Disease and Injury (Poplar) - Oral - Abstract ID: 324

Mr. Paul Musarurwa, Ms. Tsitsi Juru, Dr. Hilda Bara, Dr. Prosper Chonzi, Dr. Gerald Shambira, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Background
Prostate cancer (PCa) is second most common cancer among Zimbabweans after cervical cancer. It is the leading malignancy among black men contributing 22.5% of all male cancers. Harare City contributes 35% to the cancer burden in Zimbabwe. Between 2006-2015, PCa cases increased by 218% from 205 to 651. In 2016, PCa was the leading cause of mortality due to malignancies. We described characteristics of PCa patients and the trends in PCa incidence and mortality in Harare City.

Methods
We conducted a secondary data analysis on PCa in 2018. We extracted data from the Zimbabwe National Cancer Registry database and exported to Microsoft Excel® for analysis. We utilized Zimbabwe national population denominators and the 1960 world population to compute crude and age-standardized incidence and mortality rates (ASIR and ASMR) using CanReg4 software. Simple linear regression was used to determine significance of trends. We determined survival duration as the interval between date of diagnosis and date of death.

Results
We analysed 1896 PCa patient records from 2006-2015. Of these, 1763 (93%) were blacks. Median age was 74 years (Q₁=58; Q₃=86). The youngest PCa patient was 32 years. Only 26.3% (497/1896) were staged at diagnosis and over 95% (473/497) were in stage III or IV. The proportion of PCa patients increased from 17.1% to 23.1% (R²=0.79, p<0.01) and deaths, 14.7% to 22.5% (R²=0.82, p<0.01) from 2006 to 2015. The ASIR increased from 60.1 to 100.2 per 100000 (R²=0.78, p<0.01) and ASMR increased from 25 to 42.3 per 100000 (R²= 0.80, p<0.01). Only 13.5% (55/407) lived beyond 5 years after diagnosis.

Conclusion
PCa incidence and mortality rates increased significantly in Harare City. There is late presentation for PCa diagnosis and survival at five years was poor. Following this investigation, we conducted two awareness campaigns focusing on PCa screening, early diagnosis and treatment services.
Magnitude of road traffic injuries and factors associated with mortality, - Ilala Municipal Council, Dar es Salaam, Tanzania, 2016

Wednesday, 30th October - 11:30: Session C: Chronic Disease and Injury (Poplar) - Oral - Abstract ID: 419

Dr. Angela Samwel, Dr. James Gibson, Dr. Ahmed Abade, Dr. Rogath Kishimba, Dr. Hamisi Shabani, Dr. Candida Moshiro

Background
Road traffic accident-related injuries and deaths disproportionately affect persons in low- and middle-income countries. Accurate data are important for informed decision-making, which is limited by the incompleteness of existing data sources. Capture-recapture methods allow the combination of multiple data sources, which can improve the reliability of estimates. We estimated the magnitude of road traffic injuries and deaths using capture-recapture methods, and determined factors associated with mortality in Ilala Municipality, Tanzania.

Methods
We used a two-sample capture-recapture method to estimate the number of victims using police and health facility data from January through June 2016 in Ilala Municipal Council, Dar es Salaam, Tanzania. Victims were individuals who either got injury or died due to road traffic crash; a collision involving at least one moving vehicle with another vehicle, pedestrian, animal, stationary objects or a fall from the vehicle. Probabilistic and manual methods were used to identify individuals found in both data sets. We used Chao’s lower bound formula to compute the estimated actual number of road traffic injuries and deaths. Multivariable logistic regression was used to determine factors associated with mortality adjusting for multiple confounders using stata software.

Results
A total of 2,532 road traffic victims were reviewed; 1,398 and 1134 were from hospital and police data respectively with 249 matching. We estimated a total of 4,997 (95% confidence interval [CI] 4,515-5,480) road traffic injuries and deaths had occurred, corresponding to 652/100,000 persons annually. Being male (adjusted odds ratio [AOR] =13.5, 95%CI 1.7-110.2) and being involved in night-time accidents (AOR=3.7, 95%CI 1.4-9.5) increased odds of dying. Compared to persons ≤19 years, persons ≥40 years had reduced mortality (AOR=0.19, 95%CI 0.04-0.90).

Conclusion
The magnitude of road traffic injury and deaths in Ilala is substantially higher than what was reported using either hospital or police data individually. Interventions should be targeted to males, night-time driving, and persons ≤19 years to reduce road traffic crash mortality.
Risk Factors for Cardiovascular Diseases among Adolescents in Lagos: Implication for Blood Pressure Profile and Weight Status – Nigeria, December 2017

Wednesday, 30th October - 11:50: Session C: Chronic Disease and Injury (Poplar) - Oral - Abstract ID: 555

Dr. Adedoyin A Fetuga, Dr. Muhammad Shakir Balogun, Dr. Olufemi Ajumobi, Dr. Eniola Bamgboye, Dr. Patrick Nguku, Prof. Magbagbeola D Dairo

Background
Cardiovascular diseases (CVDs) account for 31% of all deaths worldwide. The underlying pathology is a lifelong process that begins in childhood and progresses in adolescents depending on the presence of risk factors. Identifying and managing risk factors in adolescents gives an opportunity to control CVDs. We, therefore, assessed the prevalence and determinants of CVD risk factors among adolescents in Lagos, Nigeria.

Methods
We conducted a community-based cross-sectional study among 640 adolescents selected by multistage sampling in Lagos, Nigeria. We collected data on sociodemographic characteristics, family history, modifiable and intermediate risk factors for CVD using an interviewer-administered questionnaire. We measured height, weight and blood pressure (BP). Using percentiles based on age, sex and height, we determined BP profile and we determined weight status using Body Mass Index percentile calculator for boys and girls (2-20 years). We generated frequencies and proportions and identified risk factors by calculating adjusted odds ratios and 95% confidence interval (CI) through multivariable logistic regression.

Results
Mean age of respondents was 13.5±2.7 years; 323 (50.9%) were males and 608 (95.8%) were students. Overall, 106 (17.3%) had elevated BP while 26 (4.1%) were overweight. Nine (1.4%) respondents had ever smoked cigarette, 46 (7.2%) drank alcohol, 567 (89.3%) and 571 (91.2%) had low fruits and vegetables intake respectively. Smoking (OR= 4.93, CI= 1.21-20.04) and vegetable intake (OR= 0.3, 95%CI= 0.1-0.9) were associated with elevated BP. Female sex (OR= 3.6, 95%CI= 1.4-9.1) was associated with being overweight. After multivariable analysis, the predictors of elevated BP were smoking (aOR= 7.34, 95%CI= 1.65-32.60) and vegetable intake (aOR= 0.3, 95%CI= 0.1-0.9).

Conclusion
This study demonstrates the presence of risk factors for cardiovascular diseases in adolescents. We counseled adolescents on risk reduction and referred adolescents with elevated BP to health facilities for management. We recommended routine screening for CVD risk factors for inclusion in adolescent health services.
Patterns and Determinants of Female Perpetrated Intimate Partner Violence in Abuja – Nigeria 2018

Wednesday, 30th October - 12:10: Session C: Chronic Disease and Injury (Poplar) - Oral - Abstract ID: 647

Dr. Ramatu Abdu-Aguye, Prof. Dahiru Tukur, Dr. Mahmood Dalhat, Dr. Saheed Gidado, Dr. Muhammad Shakir Balogun, Dr. Chukwuma Umeokonkwo

Background
Intimate partner violence (IPV) describes psychological, sexual or physical harm by a current or former partner. It remains a global public health problem, with men majorly perpetrating IPV. In Nigeria, however, female-perpetrated IPV has been reported, but its burden and patterns are largely unknown and unexplored. We assessed the prevalence, patterns and determinants of female-perpetrated IPV in Abuja, Nigeria.

Methods
We conducted a cross-sectional study with quantitative and qualitative methods of data collection. We used systematic sampling to recruit 537 male civil servants who had been cohabiting with a female partner in Abuja for ≥12 months. We used a semi-structured questionnaire uploaded on Open Data Kit to collect data on occurrence, patterns, and determinants of IPV. We conducted focused group discussions (FGD). We calculated frequencies, means, and proportions; and conducted multivariable logistic regression for adjusted odds ratios. Excerpts were reported from FGD.

Results
The Mean age of respondents was 49.1±0.4 years. Of 537 respondents, 17.1% had >1 partner, 38.7% had co-habited for ≥10 years while 23.5% had ≥5 children. Lifetime prevalence of IPV was 83.4% (n=448; 95%CI: 80-86%) while prevalence in preceding year was 64.2% (n=345; 95%CI 60-68%). Psychological, sexual and physical patterns of abuse among the 448 lifetime IPV victims were 70.4%, 55.1%, and 26.3% respectively. Cyberstalking, previously unexplored was experienced by 61.3%. Men ≥40 years (AOR= 5.3; 95%CI= 2.94 - 9.09), number of children ≥5 (AOR= 2.6, 95%CI= 1.48-4.63), cohabiting for <10 years (AOR= 5.6, 95%CI= 2.86 - 11.11) were significantly associated with experience of IPV. An FGD participant said, “...women are bold enough now to commit IPV because many have become breadwinners...”

Conclusion
Female-perpetrated IPV is prevalent in Abuja with emerging patterns of cyber stalking. Being more than 40 years, having five children or more and cohabiting for less than 10 years were associated with higher odds of experiencing IPV among participants. Efforts to address IPV should be multi-faceted and focused on men and women. Counseling and support systems for victims need to be strengthened. Findings were shared with civil rights organizations.
Session D: Award-Eligible Presentations; Moderators: Sahar El-Shourbagy, Chima Ohuabunwo; Wednesday, 30 October 2019, 10:30am; Venue: Willow

Wednesday, 30th October - 10:30: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 338

Dr. Nejib Charaa, Dr. Rabaa Ghrab, Dr. Aicha Othman, Dr. Mohamed Makhlouf, Dr. Hajer Letaief, Prof. Nissaf Ben Alaya

Background
Human brucellosis is a mandatory notifiable disease in Tunisia and despite control measures the overall incidence in 2017 was 9.8 per 100,000 population. In Douz (southwestern Tunisia) no cases were notified in 2017. Two cases were reported on March 19, 2018. Therefore, the aim of this study was to identify the source of contamination and set up control interventions.

Methods
We conducted a case-control study based on case index finding. A case was defined as a resident of Douz who presented clinical brucellosis between January and March 2018 with a positive Wright test ≥ 160. A control was a neighbor of the case who had a negative Rose Bengal test and who showed no signs of brucellosis. Information about consumption of dairy products and contact with animals were collected using a questionnaire. Univariate and Multivariate analysis were performed to estimate odds ratios of risk factors. Active screening for animal brucellosis was carried out in goats.

Results
A total of 25 cases and 52 controls were enrolled in the study. Of the cases 56% were female and the median age was 41 years. All cases consumed goat’s milk; out of which 92% had bought it from the same breeder. Consumption of goat’s milk from this breeder (aOR=30.78, 95% CI [6.47-235.91]) and consumption of unboiled goat’s milk (aOR=14.84, 95% CI [2.04-310.44]) were independent risk factors for the occurrence of brucellosis in cases. The breeder had 18 goats, five of which were smuggled from a neighboring country. Three of them were diagnosed with brucellosis.

Conclusion
Consumption of unboiled milk from smuggled sick goats was the main risk factor of human brucellosis in this outbreak. The sick goats were identified and slaughtered. The other goats were put under surveillance. In addition, an education campaign was conducted. Vaccination and control of animal movements across borders need to be strengthened in order to control the disease in animals.
An Outbreak of Fever and Death in a Training Camp for Young Men – Kohat, Pakistan 2018

Dr. Eisha Mansur, Dr. Nails Azam, Dr. Tariq Bashir, Dr. Mansoor Tariq, Dr. Tahir Butt

Background
On 1st June 2018, an 18-year-old from a males’ training camp in Kohat developed fever which rapidly progressed to coagulopathy, respiratory distress, and death. Three days later another 4 members of the same new cohort of trainees living in the same hostel of that camp presented with similar clinical picture; one also died. Considering the possibility of a serious infectious disease outbreak, an investigation was initiated.

Methods
A case was defined as a resident of the hostel developing fever from mid-May onward. Cases were asked about known causes of fever like systemic infection, inflammatory disorder, malignancy, drugs, physical exertion, heat exposure, animal contact, and recent travel. A retrospective cohort study was done to verify association of risk factors with fever.

Results
The training camp hostel comprised 3 blocks; each having separate floors for new and old cohorts. From 1-13 June 36 cases occurred including 2 deaths (Attack Rate=6.1%, Case Fatality Rate=5.6%). Thorough clinical and laboratory work-up could not identify the cause/source of outbreak. Microbiological tests conducted for all possible endemic infections were also negative. Descriptive analysis of cases showed that all 36 cases were from the new cohort; none among the old cohort. Thirty-two cases were from blocks 1 and 2 of the hostel while 4 cases were from block 3. The new cohort gave history of un-acclimatized strenuous outdoor physical exercise (≥6hrs/day). Prevailing temperature of Kohat was 40-45°C. Attack Rates (AR) for blocks 1 (AR=6.8%) and 2 (AR=7.6%) were twice compared to block 3 (AR = 2.6%) where routine exercise was limited to 2 hrs/day. Occurrence of disease was associated with outdoor physical exertion (≥6hrs/day; RR=4.3; 95% CI=3.3-5.3), sleep deprivation (≤5hrs/day; RR=3.3; 95% CI=2.4-4.2), inadequate hydration (<8 glasses/day; RR=3.2; 95% CI=2.7-3.6), and overcrowding (RR=3.0; 95% CI=2.5-3.4).

Conclusion
The outbreak of fever and deaths was probably heat related, precipitated by unaccustomed physical exertion of the new cohort in hot weather aggravated by overcrowded living conditions, insufficient water intake, and lack of sleep. Modification of exercise routine and appropriate re-hydration effectively checked the outbreak. Findings of investigation allayed prevailing panic about an infectious disease outbreak and led to an acclimatization policy for incoming cohorts.
Foodborne outbreak linked to salad consumption in a Senior High School, Sekondi-Takoradi Metropolis, Western Region, Ghana-2019

Ms. Irene Amedzro, Dr. Abraham Tachie-Menson, Mr. Obed Bangdome Ofori, Ms. Akua Boadiwaa Amoh-Yeboah, Mr. Daniel Agudey, Ms. Vida Kwofie, Dr. Christabel Ayepah, Ms. Safiatu Tarl Abdullah, Mr. Ebenezer Kofi Mensah, Dr. Donne Ameme, Dr. Ernest Kenu

Background
Globally, an estimated 600 million people fall ill with more than 400,000 dying every year from foodborne diseases (FBD). On March 29, 2019, Sekondi-Takoradi Metropolitan Health Directorate received report of suspected FBD among 60 students of a girl’s Senior High School in Sekondi-Takoradi Metropolis. We initiated investigations same day to determine the magnitude of the outbreak, identify the etiologic agent, risk factors and implement control measures.

Methods
We interviewed case-patients and reviewed medical records to collect demographic and clinical data. Persons in the school with either abdominal pain, diarrhea or vomiting from March 27-30, 2019 were classified as cases. We conducted active case finding to identify more cases and tested case-patient and food vendor (FV) stool specimens for enteric pathogens. We conducted an unmatched case-control study using two control cases per case-patient to identify FBD outbreak-associated exposures. Onsite environmental investigation was conducted at school canteen. Associations between food exposures and FBD were determined using odds ratios (ORs) and 95% confidence intervals (CIs).

Results
Of the total population of 1,905, 40 case-patients were identified with an attack rate of 2.1% without death. Mean age of case-patients was 17+0.97 years. Majority, 33 (94.3%) of the case-patients ate salad from school canteen on March 27, 2019. The index case was a 15-year old student who ate salad at the school canteen. Compared to controls, case-patients had higher odds of consuming salad at canteen (COR=13.9; 95% CI= 3.09-62.44). No left-over food was available for testing. Escherichia coli (E. coli) 0157:H7 was isolated from one out of 10 stool specimens. All 20 FVs in the canteen did not have medical certificate.

Conclusion
Salad was the most likely vehicle of transmission of the probable E-coli FBD outbreak in the school. Outbreak control and preventive measures were prompt treatment of case-patients, education of students and FVs on food safety as well as medical examination of FVs.
An Outbreak of Hemorrhagic Symptoms –Behira Governorate, Egypt, 2018

Wednesday, 30th October - 11:30: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 170

Dr. Hala Saad, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Background
On June 17, 2018, the hot line of the emergency unit of Ministry of Health and Population preventive sector was notified of cluster of 13 cases with coagulopathy and hemorrhagic diathesis in a village in Lower Egypt. Cases were from one extended family living in three adjacent houses. Recently many outbreaks of hemorrhagic fevers were announced in near African countries. Epidemiological investigation was conducted to confirm outbreak, identify causative agent and implement control measures.

Methods
Active case finding was performed in the village households and patients’ medical records reviewed in two hospitals where patients admitted for treatment. Cases were defined as anyone having hemorrhagic symptoms with or without fever during last 12 months. Patients were interviewed using questionnaire that include demographic information, signs and symptoms, history of hemorrhagic genetic disorders. Household observation and environmental investigations were conducted. Patients’ blood collected and tested for Q fever, chikungunya and Rift Valley by ELISA and PCR, while environmental samples tested for inorganic toxins.

Results
A total of 18 cases with hemorrhagic symptoms were detected. Their median age was 15 (Range: 2-63 years), and 12 (66.7%) were females. The index case occurred back in November 2017. Symptoms included subcutaneous hemorrhage in 17 (94.4%), hemolytic anemia 14 (77.8%), hematuria 12 (66.7%), nose and gum bleeding 9 (50.0%), and intracranial hemorrhage in 3 (16.7%) with no fever or genetic disorders reported. Same type of rodenticide was observed at the kitchens of affected households. Blood samples were negative for arboviruses, bromadiolone was detected in wheat sample. Patients treated with Vitamin K orally or intravenously 15 (83.3%) and blood transfusion in 3 (16.7%), no deaths reported.

Conclusion
An outbreak of bromadiolone rodenticide poisoning reported in a Village in Lower Egypt. Community health education is essential for proper safe handling of rodenticides and pesticides to prevent such serious incidents.
Geographical Variation in Childhood Measles Vaccination and Associated Factors in Ethiopia: A Spatial and Multilevel Analysis

Mr. Tesfahun Taddege, Dr. Lemma Derseh, Mr. Ayeneh Negesse

Background
In Ethiopia, despite a considerable improvement of first-dose measles-containing vaccine (MCV1) coverage, measles outbreaks are occurring in most parts of the country. Such contradiction may have resulted from a heterogeneity of measles vaccination coverage with pockets of missed children or accumulation of unvaccinated children in specific geographical areas. Understanding the geographical variation in childhood MCV1 is crucial for evidence-based decision-making. However, the spatial patterns of MCV1 and its predictors are poorly understood in Ethiopia. Hence, this study aimed to explore the spatial pattern and factors affecting childhood MCV1 coverage.

Methods
A further analysis of the 2016 Ethiopia Demographic and Health Survey data was conducted, and a total of 3,722 children nested in 611 enumeration areas were included in this analysis. The global spatial auto-correlation was assessed using the global Moran’s index statistic (Moran’s I) to evaluate whether the pattern expressed is clustered, dispersed, or random across the study areas. In the presence of global spatial auto-correlation, Poisson-based purely spatial scan statistic was employed to detect local clusters of areas with low childhood MCV1. Multilevel logistic regression models were fitted to identify individual and community level factors affecting childhood MCV1.

Results
Spatial heterogeneity of childhood MCV1 was observed (Global Moran I=0.13, p-value < 0.0001), and seven significant SaTScan clusters of areas with low childhood MCV1 coverage were detected. The most likely primary SaTScan cluster was detected in the Afar Region, secondary cluster in Ethio-Somali Region, and tertiary cluster in Gambella Region. Older child age (AOR=1.53; 95%CI: 1.25-1.88), pentavalent vaccination first dose (AOR=9.09; 95%CI: 6.86-12.03) and third dose (AOR=7.12; 95%CI: 5.51-9.18), were the factors that increased the odds of MCV1 vaccination. Living in Afar, Oromia, Ethio-Somali, Gambella, and Harari regions were factors associated with lower odds of MCV1 from the community-level factors. Children far from health facilities had higher odds of receiving MCV1 (AOR=1.31, 95%CI=1.12-1.61)

Conclusion
A clustered pattern of areas with low childhood MCV1 coverage was observed in Ethiopia. Both individual and community-level factors were significant predictors of childhood MCV1. Hence, it is good to give priority for the areas with low childhood MCV1 coverage and to consider the identified factors for vaccination interventions.
An ecological assessment of the impact of funded cocoon and maternal pertussis vaccination strategies on pertussis epidemiology in young infants - Australia, 2000–2017

Wednesday, 30th October - 12:10: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 236

Ms. Dharshi Thangarajah, Dr. Jonathan Malo, Dr. Emma Field, Dr. Stephen Lambert

Background
Despite the availability of pertussis-containing vaccines and high vaccination rates in children, pertussis (whooping cough) remains one of the most commonly notified vaccine-preventable diseases in Australia. ‘Cocooning’ (protecting infants by vaccinating close contacts), and maternal vaccination during pregnancy, are two pertussis vaccination strategies funded in various Australian states and territories to protect infants. The purpose of this study was to provide an ecological assessment of the impact of funded cocooning and funded maternal vaccination programs on pertussis epidemiology in young infants.

Methods
We reviewed national pertussis notification data from 2000–2017, a period where there was high and stable coverage of primary course vaccination. Notifications in children aged <6 months were analysed by relevant strategy time-periods for each Australian state and territory. The population-level impact of vaccination strategies on pertussis in young infants was assessed using a two-sample test of proportions to compare the proportion of notifications in children aged <8 weeks before and after periods of funded ‘cocoon’ and maternal vaccination strategies.

Results
In Australia from 2000–2017 there were 5,904 pertussis notifications in children aged <6 months, with 1,903 (32.2%) occurring in children aged <8 weeks. During periods where maternal vaccinations strategies were funded, the proportion of notifications in children aged <8 weeks was 20.3%. This was significantly lower (p=0.002) than the proportion during periods where no such strategies were funded (27.9%). We were unable to identify any difference in proportions (p=0.670) when comparing periods before (34.8%) and after (34.2%) cocooning strategies were funded in various Australian states and territories.

Conclusion
This study provides population-level support for the continuation of maternal vaccination during pregnancy as a strategy to protect children aged <8 weeks against pertussis infection in Australia.
FETP Frontline Oral Presentation Session; Moderators: Dianna Carroll, Augusto Lopez; Wednesday, 30 October 2019, 3:30pm; Venue: Willow
Descriptive Study on Suicides in Belize, 2014 – 2018

Mr. Edgar Nah, Mrs. Lorna Perez, Dr. Russell Manzanero

Background
Suicide is preventable with appropriate interventions and there exist many identifiable risk factors, the biggest being a prior suicide attempt. Suicide is the second leading cause of death for 15-29-year-olds worldwide. The objective of this study is to describe the trends of suicide to identify the most affected populations.

Methods
Belize Health Information System (electronic health records) encounters between 2014 and 2018 with International Classification of Diseases – 10th Revision X60 to X84, were extracted for review, cleaning, and analysis. Secondary data including demographics, time, and suicide method were analyzed and rates calculated using Microsoft Excel.

Results
A total of 129 suicides were recorded with a slight increase of 4% in the national rate from 2014 to 2018 (range 5.6-7.6/100,000 population). Female-to-male suicide attempt ratio was 2:1 while suicide completion ratio was 1:4. Mean male suicide rate between 2014 and 2018 was 10.9 per 100,000 population, while the mean female rate was 2.8 per 100,000 population. Majority of suicides occurred between ages 15 and 35. The 60-64-year age group had the highest mean rate of the five-year period with 21.8 deaths per 100,000 population. Stann Creek District recorded the highest mean rate in the period with 10.3 suicides per 100,000 population. Hanging was the mode of choice accounting for 67% (86) of suicides in the period. Five suicide victims had a prior attempt reported, and three died by the same attempt that had failed.

Conclusion
Older age groups and males are the most affected populations. Hanging is the most common method. Further studies are necessary to determine if prior attempts are a strong risk factor. Training recommended to improve data quality for other demographic risk factors such as education, occupation, and marital status. It is recommended that data from the private sector be collected to strengthen surveillance. Dialogue with the Council on Aging should be initiated as intervention for the elderly.
Investigation of maternal death, Manhyia North Sub Metropolis, Ashanti Region, Ghana - 2019

Wednesday, 30th October - 15:50: FETP Frontline Oral Presentation Session (Willow) - Oral - Abstract ID: 531

Ms. Elsie Kissi-Appiah, Ms. Magdalene Akos Odikro, Ms. Delia Bandoh, Mr. Joseph Asamoah Frimpong, Mr. Lenox Goulbourne, Dr. Donne Ameme, Dr. Ernest Kenu

Background
Maternal mortality remains unacceptably high as a major public health problem globally. Approximately 830 women die daily from preventable causes related to pregnancy and childbirth. In 2018, maternal mortality rate in Ghana was 319 per 100,000 live births. On 10th April 2019, a maternal death occurred at a local hospital in Manhyia North sub metropolis of the Ashanti Region. We conducted an investigation to determine the cause of death and factors contributing to the death.

Methods
We conducted a maternal death audit on 17th April 2019 at the hospital using the Ghana Health Service standard maternal audit form. The maternal death audit committee comprised of two medical officers, one principal midwife, three midwives, two public health nurses, a nurse manager, a biomedical scientist, a pharmacist, a physician assistant and the hospital administrator. The patients' folder, antenatal clinic (ANC) and inpatient records were reviewed. We also interviewed staff who managed the case.

Results
Patient was 25-years old woman who had had two previous vaginal births. She made her 11th ANC visit on 9th April 2019 at 41 weeks gestation and was admitted on same day for induction of labour on account of postdate pregnancy. Her blood pressure on admission was 120/80mmHg. Labour was induced with two doses of 50mcg misoprostol at 4 hours interval. Patient was referred to a referral hospital the following morning on account of abdominal pains, collapsed veins and a weakened thread pulse. Blood pressure at the time of referral was 60/40mmHg. Patient died on arrival at referral hospital on account of ruptured uterus.

Conclusion
Cause of this maternal death was hemorrhagic shock secondary to uterine rupture. Human error in lifesaving skills and organizational issues such as absence of a specialist and delay in reaching the referral facility were contributory factors. We instituted a permanent maternal death audit committee. Health facility staff were taken through a three day lifesaving skills training for proper case management of maternal cases.
Prevalence and risk factors of needle stick and sharps injuries among Koidu government hospital workers, Kono district, Sierra Leone, 2019

Wednesday, 30th October - 16:10: FETP Frontline Oral Presentation Session (Willow) - Oral - Abstract ID: 455

Mr. Abu Gbondo, Mr. Eric Ikoona, Ms. Sara Demas, Mr. Gildo Okure, Mr. Gebrekrstos Gebru, Mr. Uzoma Ogbonna, Mr. Leonard Hakizimana, Dr. Mohamed Alex Vandi, Dr. Marta Guerra

Background
Over 50% of healthcare workers (HCWs) in Africa are exposed to needlestick and sharps injuries (NSIs) with potential risk of transmitting blood-borne pathogens. Although NSIs were a potential determinant of Ebola Virus Disease (EVD) spread among HCWs during the 2014-2016 EVD outbreak in Sierra Leone, no assessments on implementation and outcomes of Infection and Control (IPC) practices have been undertaken. We aimed to identify risk factors for NSIs among HCWs at Koidu government hospital (KGH).

Methods
A cross-sectional survey was conducted among 104/186 (56%) HCWs from February to April 2019. Data on demographic characteristics, history of NSIs, hospital department assignment, training on IPC and NSIs policies, and reporting practices were collected. Descriptive and chi-square analyses were performed to identify risk factors for NSIs.

Results
Although 69/104 (66%) HCWs reported experiencing NSIs, only 31/69 (45%) reported them to hospital authorities. Among those who experienced NSIs in the past year, 45/69 (65%) reported one to two injuries and 13/69 (19%) reported more than four injuries. The rate of NSIs was higher among female HCWs 42/55 (76%) than males 16/27 (59%). Injection needle pricks caused 45/69 (65%) of the NSIs and 23/69 (33%) of all NSIs occurred during sharps disposal in bio-safety containers. Although there was no significant variation among the different professional cadres, those who worked in “high-risk departments (surgery, maternity)” were more likely to report NSIs than those in “low-risk departments” (PR 2.8; 95% CI 1.1-7.09). Receiving training on IPC training reduced the likelihood of NSIs (PR 0.31; 95% CI 0.09-0.98).

Conclusion
The prevalence of NSIs among HCWs in KGH is high, but was significantly reduced through training on IPC. Implementation and continued support of IPC training programs focusing on sharps disposal process and targeting “high-risk departments,” is urgently needed to prevent potential transmission of bloodborne pathogens, including EVD.
Mr. Mohammed Yasin

Background
Scabies is an ecto-parasitic, highly contagious skin disease caused by infestation of the skin by the human itch mite, Sarcoptes scabiei var. hominis. Dermatologists estimate that more than 300 million cases of scabies occur worldwide every year. In Ethiopia, according to national survey conducted in 2008, 6.2% of school children and 5.6% of orphan school children were affected by scabies. On July 2017 a scabies outbreak was reported to the Hulbareg District Health Office among “Deresa” (religious students) in Bilawanja Mosque. The purpose of this study was to investigate scabies outbreak, identify factors associated with scabies transmission, and to take public health action among the group affected.

Methods
Unmatched case control study with case control ratio of 1:2 was conducted from 15 to 25 July, 2017 in Bilawanja Mosque in Hulbareg District. Controls were individuals who were living within Bilawanja Mosque and who had no Scabies sign and symptoms. Data was collected by face to face interview of cases and controls through structured questionnaires. Data analysis was done using Microsoft excel and SPSS (version 20). Multi variable and binary logistic regressions were conducted and odds ratio calculated with their corresponding 95% confidence interval.

Results
A total of 60 respondents were included; 20 cases and 40 controls. In bivariate analysis age, travel history, sharing clothes and close contact with scabies patient were associated with contracting scabies. In multivariate analysis, people who shared clothes with scabies patients were 27.6 (95% CI=3.2-222) times more likely to develop scabies and individuals who had close contact with an ill person were 20.6 (95% CI=1.6-262) times more likely to develop scabies.

Conclusion
In this study, scabies was a public health problem among Deresa in Bilawanja Mosque. Sharing clothes and close contact with scabies patients were identified risk factors. Public health education to improve recognition of scabies, with prevention of sharing clothes and physical contact with cases, will help contain future outbreaks.

Keywords: Investigation; Outbreak; Scabies; Deresa.
Treatment Outcomes among Drug Sensitive Tuberculosis Patients in Tana River County - Kenya, 2014–2017

Mr. Nalikwa Bonaya, Dr. Elvis Oyugi, Dr. Esther Kisangau, Dr. Zeinab Gura

Background
Kenya is among 22 high burden countries that together account for 80% of TB cases globally. In 2017, Kenya achieved a treatment success rate (TSR) of 83.2% and cure rate (CR) of 65%. Tana River County had TSR of 85%, CR of 72.5% for 2017 and has not met set targets of 90% TSR and 85% CR over the years. We described treatment outcomes among drug sensitive TB patients.

Methods
We reviewed both private and public facility records for Tana River County from the national Electronic TB Patient Management System from 2014–2017. A case was a record of TB confirmed by sputum microscopy, Gene Xpert or culture, or diagnosed clinically. We excluded records of patients with drug resistant TB. We collected socio-demographic and clinical information. Treatment outcomes were classified as complete, cured, died, failed, lost-to-follow-up and not evaluated. We calculated descriptive statistics.

Results
A total of 1,678 records were reviewed; males were 58.6% (983/1,678), median age of patients on treatment was 30.1 years (Range 6 weeks – 99 years), 10.4% (174/1,678) were HIV positive, 86.6% (1453/1,678) were treated successfully, 7% (118/1,678) died, 4.1% (69/1,678) lost-to-follow-up and 2% (34/1,678) not evaluated. Among 773 (46%) bacteriologically confirmed cases; 74.3% (574/773) got cured, 14.1% (109/773) completed treatment without follow-up sputum tests, 4.9% (38/773) died and 3.5% (27/773) lost-to-follow-up. All 174 HIV positive patients were on preventive therapy, 94% (164/174) were on Anti-retroviral Therapy (ART), despite this, 19% (33/174) died. Among the 7% (118/1,678) who died, 25.4% (30/118) received nutritional intervention, 80.5% (95/118) had pulmonary TB and among them 59% (56/95) were clinically diagnosed.

Conclusion
Pulmonary TB may have contributed to most of the deaths. A fifth of the HIV positive cases died despite being on ART. We recommend improved integration of TB treatment with nutrition services and comprehensive HIV care.
Outbreak of Salmonella enteritidis among guest of wedding party - Ajara, Georgia, 2018

Wednesday, 30th October - 17:10: FETP Frontline Oral Presentation Session (Willow) - Oral - Abstract ID: 255

Mrs. Mziuri Jakeli, Dr. Nona Ephadze, Dr. Eka Khabazi, Mrs. Keti Galdavadze

Background
Ajara Public Health Center received information from two clinics on hospitalization of three patients with diarrhea on June 18. All the patients attended wedding party on June 17. Investigation was conducted to confirm outbreak, identify risk-factors and prevent disease further spread.

Methods
Cohort study design was selected for the investigation. Demographic and consumed food data was collected during face-to-face interview, using standardized questionnaire. Additional patients were identified based on case definition: person, who attended the wedding party on June 17 in Batumi and developed diarrhea and fever, and one of following symptoms - nausea, vomiting, abdominal pain, and confirmed with positive culture or linked to a laboratory confirmed case. Attack rates (AR) for consumed products were calculated to identify risk-factors. Fecal specimens were collected from patients to perform bacteriological testing.

Results
Out of 85 persons, who attended the wedding party, 77 were interviewed. Overall 34 persons met case definition (AR 44%), out of them 10 (29%) were hospitalized, 11 (32%) were outpatients and 13 (38%) didn’t seek medical care. Age range of patients was 2-78, with median 25.5. Among patients 11 (32%) were male. The highest AR- 80% was observed in children under 10 years old, and the lowest AR- 30% in 40-49 age group. We calculated AR for all types of served foods. Two food items were associated with the illness: 31 persons out of 35, who ate wedding cake, developed disease (AR -89%), in unexposed group of 42 AR was 7%. Also 14 out of 19 were sick in the group who ate (AR - 74%) and 20 out of 58 (AR-34%) who didn’t eat cupcakes. From 11 clinical specimens two positive cultures of Salmonella enteritidis were received.

Conclusion
Salmonellosis outbreak was related to the wedding cake. Leftovers were discarded and the National Food Agency was notified for further investigation.
Poster Session;
Wednesday, 30 October 2019, 3:30pm; Venue: Stone Mountain Ballroom
**Investigation of Monkeypox cases in Pujehun and Kailahun Districts, Sierra Leone, 2018 – 2019**

**Mr. Nyuma Jeremiah Sengu, Mr. Musa Deiman Sheriff, Mr. Musa A. Sesay, Mr. Alhaji Conteh, Dr. Anthony Domawa, Mr. Amara Alhaji Sheriff, Dr. AMARA NGEGBAI, Dr. Peter Lansana, Mr. Uzoma Ogbonna, Mr. Leonard Hakizimana, Mr. Gildo Okure, Mr. Gebrekrstos Gebru, Mr. Eric Ikoona, Mr. Eddy Ortega, Ms. Erin Whitehouse, Ms. Andrea McCollum, Dr. Mohamed Alex Vandi, Dr. Marta Guerra**

**Background**

Monkeypox is an emerging zoonotic viral disease clinically similar to smallpox with case fatality rates from 1-10%. In Sierra Leone, three cases were confirmed from 1970 to 2017. From 12th December 2018 to 2nd March 2019, Field Epidemiology Training Program trainees responded to notifications from the District health Management Teams and investigated the suspected cases in Pujehun and Kailahun districts to confirm the diagnosis, identify possible risk factors and additional cases, and institute control measures.

**Methods**

Case-patients and families were interviewed, medical records were reviewed, and samples from lesions and blood were obtained and analysed at US Centers for Disease Control and Prevention. A case was defined as any person from the respective communities who presented with fever 38.5°C, generalized vesiculopustular rash and lymphadenopathy, and having history of contact with animals or persons with similar symptoms. Information was collected on demographics and travel history. We conducted active case finding, contact tracing and risk communication among the communities.

**Results**

Patients were a six-year old male from Pujehun district and a 38-year old female from Kailahun district. Both presented with generalized vesiculopustular rash, and lymphadenopathy preceded by a two-day history of fever. Sera from both tested positive for orthopox IgM and IgG, and lesion samples were positive by RT-PCR. One patient reported a contact with rodents and primates, and the other had history of contact with a sheep and a person exhibiting similar symptoms. The patients recovered, no additional cases were found, and none of 54 identified contacts developed symptoms during the 21-day follow-up.

**Conclusion**

This investigation identified a second case of monkeypox in Pujehun district within two years and the first case in Kailahun district. Because of evidence of widening distribution of monkeypox, its clinical similarity to variella, and increasing proportion of the population not vaccinated for smallpox and, therefore, not protected against monkeypox, we recommend the following measures: 1) enhanced national surveillance for monkeypox by public health staff; 2) increased sensitization for clinical staff to include monkeypox in the differential diagnosis for rash illness; and 3) educational campaigns targeting the community to reduce the risk of animal-to-human transmission of monkeypox.
Anthrax Outbreaks among Domestic Ruminants Associated with Butchering Infected Livestock and Improper Carcass Disposal: Three Districts, Uganda, 2016-2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 12

Dr. Fred Monje, Ms. Esther Kisaakye, Mr. Daniel Eurien, Ms. Vivian Ntono, Dr. Benon Kwesiga, Mr. Daniel Kadobera, Dr. Deo Birungi Ndumu, Dr. Alex Riolexus Ario, Dr. Bao-Ping Zhu

Background
During 2017-2018, human anthrax outbreaks (mostly cutaneous type) occurred in Arua, Kween and Kiruhura districts, Uganda, which were associated with eating and handling meat from unvaccinated domestic ruminants that died of anthrax. We investigated to determine the existence of anthrax outbreaks in domestic ruminants, identify exposures, and recommend control measures.

Methods
We defined a suspected case-animal as sudden death of a domestic ruminant with unclotted blood oozing from body orifices in the three districts, 2016-2018. A probable case-animal was positive to rapid diagnostic test using the Active Anthrax Detect (AAD) Rapid Test, and/or the identification of Gram positive rods. A case-kraal (i.e., enclosure of cattle/sheep or mixed species) had ≥1 suspected case-animal. We reviewed district veterinary records and actively searched for case-animals. We conducted case-control studies separately to compare exposures among case-kraals and control-kraals (i.e., with no suspected case-animals during the same time-period), frequency-matched by village, with ratios of 1:1 in Arua, 1:4 in Kiruhura and 1:2 in Kween. We estimated the overall associations using meta-analysis.

Results
We identified 1971 suspected case-animals (attack rate [AR] =1.4/1000) in 229 of 31500 kraals (7.3/1000). Cattle (AR=2.3/1000), goats (AR/1000=0.39/1000) and sheep (AR=0.094/1000) were all affected. 14 (67%) of the 21 animal carcasses tested were positive by both AAD and Gram stain. Arua was the most affected district (AR=14/1000), followed by Kween (AR=2.5/1000) and Kiruhura (AR=0.095/1000). The epidemic curves showed a point-source outbreak in Kiruhura, and continuous common-source in the other districts. Butchering dead livestock of suspected anthrax near the kraal (OR=8.0; 95%CI=5.2-12) and improper carcass disposal on/near the pastureland (OR=1.7, 95%CI=1.1-2.4) were significant risk factors for being a case-kraal.

Conclusion
In districts with human outbreaks, animal outbreaks occurred, which were associated with butchering of livestock with suspected anthrax and improper carcass disposal. We recommended anthrax-vaccination of domestic ruminants at greater risk, increased surveillance for sudden animal deaths, proper carcass disposal (i.e. 6 feet deep carcass burial and disinfection), and sensitization to livestock keepers about anthrax control.
Seroprevalence and risk factors of Human Brucellosis among livestock farmers and their entourage in Sidi Kacem, Morocco 2018: A Cross Sectional Study

**Background**
Brucellosis is one of the most common zoonotic diseases in the world affecting livestock and humans. In Morocco, human Brucellosis is underreported due to the lack of specific symptoms and standardized case definition for public health surveillance. Through the partnership with Global Health organizations to promote One Health Approach, a study undertaken in 2012 in Sidi Kacem, revealed a seroprevalence of 30% among livestock. However, no specific data is available among human occupational groups. We aimed to determine seroprevalence and risk factors associated to the disease among farmers and their farmer hands.

**Methods**
We used a cross-sectional study. A two stage cluster sampling was used as sampling technique to select participants. We administered a questionnaire to enrolled individuals and a blood sample collected after consent. Rose Bengal, IgM and IgG ELISA tests were performed. Sample serum of participant was regarded as serologically positive when a positive result was recorded on both tests (Rose Bengal and ELISA). We computerized data in Epi Info 7 and used a multivariate logistic regression to calculate adjusted odd ratios with confidence interval at 95%.

**Results**
Of 344,000 people living in that rural area, 421 livestock farmers and entourage were enrolled. The median age of participants was 41 years. The seroprevalence was 39.7% while 50.3% were Rose Bengal positive. In multivariate logistic analysis, elderly > 70 years (aOR=4.60, IC [1.71-12.40]) and ≤ 30 years of age (aOR=2.38, IC [1.08-5.28]) were associated with seropositivity as well as direct contact with goat (aOR=2.13, IC [1.1-4.12]), while the consumption of raw milk and meat was not so significantly.

**Conclusion**
This first study found a high seroprevalence of human brucellosis in Sidi Kacem among groups at risk. This zoonosis causes economic loss on livestock population and burden for public health. There is a need to improve laboratory support and surveillance processes among high-risk groups. Improving continuous training of physicians on brucellosis as well as public awareness and education are required. Thus, further studies are needed to identify species and biovars circulating in the region and to implement sustainable control strategies.
Epidemiological Profile of Human Brucellosis in Jordan, 2017

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 156

Dr. Nansi Abdulrahim

Background
Human Brucellosis (HB) is a zoonosis and re-emerging disease that is common in Mediterranean countries. In Jordan, HB is endemic in all parts of Jordan according to Ministry of Health (MoH) data and becomes more extensive during the animal delivery seasons (spring and summer). This study aimed to estimate the incidence rate and epidemiological features of brucellosis in Jordan in the year 2017 and determine the associated factors with HB.

Methods
This study included all confirmed cases of HB that were reported to Jordan Ministry of Health in 2017. All patients with clinical complaints compatible to HB and confirmed by a Rose Bengal test (RBT) positive and/or standard tube agglutination test (SAT) at least 1/160 or more were included in this study. Data obtained included information on the possible source of the disease and demographic, epidemiological, and laboratory characteristics.

Results
A total of 441 confirmed cases of HB were reported with an incidence rate of 6.6 cases per 100000 population. The peak incidence was during the months of March, April, and May. Cases in Mafraq and Alkarak governorates were significantly higher than those in the other governorates. Male gender (OR 2.5, 95% CI: 1.4, 4.1), age older than 10 years (OR 1.8, 95% CI: 1.1, 3.9), and assisting in raising small ruminants (OR 1.6, 95% CI: 1.1, 2.6) were significantly associated with HB in Jordan.

Conclusion
The overall incidence of HB in Jordan is 6.6 cases per 100000 population. Male gender and age older than 10 years were significantly associated with HB. Small ruminants were the main source of human infection. Control strategies in Jordan should be performed by adopting a One Health approach.
Rapid assessment of coverage of chemoprophylaxis against Leptospirosis in Post flood situation in Kozhikode District, Kerala, India, 2018

Dr. HARISANKAR SASIKUMAR, Dr. Ganeshkumar P, Mr. Kamaraj Pattabi, Mr. Sabrinathan R, Dr. A P Sugunan, Dr. Manoj Murhekar

Background
In August 2018, severe floods affected 12 districts of Kerala, displacing more than 800,000 people and exposing a large proportion to contaminated flood water. Considering the threat of leptospirosis outbreaks, health authorities initiated chemo-prophylaxis with doxycycline/azithromycin, targeting individuals exposed to flood or stagnated water. We conducted a rapid assessment to estimate the coverage of doxycycline/azithromycin chemoprophylaxis among flood affected areas of Kozhikode district.

Methods
We conducted a cross-sectional survey 3 weeks following the floods covering all the 55 flood affected panchayats of Kozhikode district of Kerala state. From each panchayat, thirty points with latitude and longitude were randomly selected using grid sampling and seven households nearest to these points were included in the survey. All the household members were interviewed to collect information about their exposure to flood/stagnant water, receipt of doxycycline/azithromycin chemoprophylaxis and its consumption. The data was collected in the field using a mobile-based application.

Results
We interviewed 1573 individuals from 396 households (number of households per random point is 56). Of the 1573 individuals interviewed, 152 (9.7%) were exposed to flood/stagnant water and among them 119 were eligible to receive chemoprophylaxis; 58 (51.8%, 95% CI: 29-73.9) of whom consumed doxycycline/azithromycin. Most of the flood affected individuals received chemotherapeutic drug from the district hospital (n=24, 16%) or health workers at the community/sub-center n=85, 56%) and remaining from community health worker (n=10, 8%). Four (12.1%) of the 33 individuals who developed febrile illness in the post-flood period with history of exposure to flood/stagnant water, were prescribed doxycycline/azithromycin.

Conclusion
The coverage of doxycycline/azithromycin chemoprophylaxis in Kozhikode was low. We recommended to intensify the chemoprophylaxis coverage of doxycycline/azithromycin and to increase the awareness among health professionals to prescribe doxycycline/azithromycin to patients with febrile illness who had exposure to flood/stagnant water.

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 435

Dr. KIRANA NORADECHANON, Dr. Sirintip Khemtong, Dr. Budsabong Kanchanasaka, Dr. Saowaluck Paduang, Dr. Wichuda Wichaidit, Dr. Bongkotchamat Phimsin, Dr. Taksina Jaruwattananon, Dr. Nuntita Ruksachat, Dr. Rattana Sariwongchan, Dr. Paisin Lekcharoen, Dr. Karoon Chanachai

Background
Japanese encephalitis virus (JEV) is a mosquito-borne zoonotic disease causing encephalitis in human, with high case fatality rate in Southeast Asia. Wild birds constitute a part in maintenance community and potentially introduce the virus to new areas. The information about virus circulation in wild birds in Thailand is neglected. This study aims to estimate JEV seroprevalence in wild birds in Thailand.

Methods
Serum samples were collected from birds captured in 13 provinces, where HPAI H5N1 outbreaks occurred during 2004-2008, in the Northern, Northeastern, and Central regions under HPAI surveillance during 2015-2016. Hemagglutination inhibition (HI) test was performed to quantify a titer of JEV antibody. Distribution of seroprevalence was described using descriptive statistics.

Results
Three hundred and twenty-four samples from 32 species in 17 families were collected. The positive rate was 6.2% (20/324), predominantly from birds of the family Estrildidae 50.0% (2/4), Laniidae 50.0% (1/2), Sturnidae 12.5% (3/24), Pycnonotidae 10.0% (1/10), Columbidae 6.0% (3/50), Ciconiidae 5.6% (2/36), Scolopacidae 5.6% (2/36). The birds in the family Anatidae and Ardeidae are considered common reservoir host for JEV and their seroprevalences were 4.0% and 5.1% in this study, respectively. Seropositive birds presented only in Northern 7.9% (10/127), and Central regions 8.5% (10/117). Forty-seven samples (47/324; 14.51%) were collected from migratory birds and showed seropositive 10.64% (5/47).

Conclusion
This was the earliest reports of JEV infection in wild birds in Thailand. The results were consistent with human situation that was more prevalent in these regions. Some migrants were seropositive and study on virus activity in these birds should be focused. Waterfowl, main avian reservoir host, in Korea had as high as 86.4% seroprevalence considerably far from which in this study. Given positive samples from HPAI surveillance, the intentional study designed for JEV detection in this host, linking with prevalence in other species and human, will give more valid results.
Background
Middle East countries are endemic for cutaneous leishmaniasis, with countries like Syria having a very high incidence. However, data on the epidemiology of cutaneous leishmaniasis in Jordan are scarce. This study aimed to assess the trend in the incidence of cutaneous leishmaniasis in Jordan from 2010 to 2016 and to explore the effect of excessive entry of Syrian refugees on the incidence of cutaneous leishmaniasis in Jordan during the same study period.

Methods
This retrospective study included all cases of cutaneous leishmaniasis that met the case definition and had been reported to the Leishmaniasis Surveillance System in Communicable Diseases Department at Jordan Ministry of Health during the period 2010-2016.

Results
A total of 1243 cases (60.7% males and 39.3% females) were diagnosed during the study period. Half of them were from the southern region and almost half had head lesions. About 19.1% of patients aged <5 years, 37% aged 5-14 year, 15.6% aged 15-24 year and 28.2% aged ≥25. Of those, 52% were Jordanians and 44.9% were Syrians. The average annual incidence rate was 1.7 per 100000 populations during the period 2010-2013. In the period of 2014-2016 when Syrian refugees entered the country excessively, the average incidence rate increased to 3.0 per 100000 populations. After 2012, the incidence rate increased significantly among Syrian refugees from 1 per 100000 in 2012 to 12 per 100000 in 2016. On the other hand, the incidence rate did not change significantly among Jordanians.

Conclusion
The incidence rate of leishmaniasis in Jordan increased in the last three years because of the influxes of Syrian refugees to Jordan. Massive efforts on the reservoir and vector control along with actively pursuing diagnosis in endemic foci are essential.
An Outbreak of Human Cutaneous Anthrax in a Village of Inner Mongolia Autonomous Region, China, 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 359

Mr. Boxi Liu, Ms. Huilai Ma, Ms. Zhen Xu

Background
Inner Mongolia is an epidemic focus of anthrax disease; animal and human epidemics are reported annually. 10 suspected anthrax cases were reported in a village from August 6\textsuperscript{th} to 11\textsuperscript{th}, 2018. We responded and conducted an investigation to assess health impacts, identify risk factors, and implement control measures.

Methods
A suspected case was defined as a resident developed at least one of the following skin symptoms; erythema, papules, blisters, swelling, and ulcerative eschar during July 15\textsuperscript{th}-August 29\textsuperscript{th}, 2018. A confirmed case was a suspected case who tested positive by PCR or isolated \textit{bacillus anthracis} through culture. Descriptive epidemiologic methods and a case-control study were conducted, to analyze the epidemiological and clinical characteristics and to identify possible risk factors. Controls who had exposed to sick or dead cows were selected and the results were analyzed by Multi-Logistic Regression.

Results
26 cutaneous anthrax cases including 25 males and one female were identified in the same village, with no severe or dead case. Cases’ median age is 45 years (20 to 63). The onset of cases was July 27\textsuperscript{th} to August 17\textsuperscript{th}. The main clinical symptoms included skin carbuncle (100%), swelling (88%), headache (80%), blisters (69%) and ulcerative eschar (69%). 25 cases and 71 controls were selected, the Multi-Logistic Regression shows that 13(50%) of 26 cases and 14(20%) of 71 controls slaughtered or skinned the dead cows (OR=153, 95%CI=6.2-3763), 14(54%) of 26 cases and 4(5.6%) of 71 controls carried dead cows (OR=391, 95%CI=24-6285), 9(35%) of 26 cases and 47(66%) of 71 controls fed sick cows (OR=6.2, 95%CI=0.5-75), 9(35%) of 26 cases and 10(14%) of 71 controls consumed the meat (OR=3.0, 95%CI=0.6-15). 76 family and hospital contacts were monitored, and none developed symptoms.

Conclusion
The source of infection was the ill cows. Skinning, slaughtering or carrying dead cows without any protection gear were the main risk factors. When there is a cow dead with unknown reason, villagers should inform to health or agricultural departments timely instead of selling or slaughtering. The local government was suggested to implementing control measures including health education and risk communication for villagers to reduce the risk of anthrax infection.
Epidemiological profile of cases of multiple outbreaks of anthrax in humans and animals in Labé Health Region, Guinea, 2014 - May 2019

Dr. Mamadou Moustapha Bah, Dr. Gbamou Nouonan, Dr. Sakoba Keita, Dr. Salomon Corvil

Background
Between 2014-2019, 33 outbreak of anthrax in animals were reported in Labé region. The Ministry of Health jointly to the Ministry of Livestock will expand an anthrax elimination plan while the profile of anthrax cases is not known in Labe. This analysis is to describe the human and animal anthrax cases like a baseline to guide the livestock and health ministries to eliminate anthrax in the region

Methods
A case series study of surveillance data between 2014-2019 was conducted. The database of the Early Warning System (EWS) of the National Agency for Sanitary Security (ANSS) and the health information system of the Ministry of Livestock were used. The data were analyzed in Epi info 7.2 and were calculated median age and proportions

Results
In humans, 70 cases of anthrax were recorded of which 30 (43%) hospitalized, 14 died (20%). All cases had history of consumption and handling of sick or dead animal meat, 56 (80.0%) were from Koubia and 14 (20%) from Lélouma. Of 70 cases, 44 had individual data with median age 15 years (1-70 years), age group 0-19 years: 26 (59.1%), male: 31 (70%), and Koranic students: 22 (50%). In animals, 284 cases were recorded, 213 (75%) were from Koubia, 68 (24%) from Mali and 3 (1%) from Lélouma. Six outbreaks with 111 (39%) animal cases were associated with outbreaks in humans. A rapid assessment of vaccination coverage in a herd at Koubia during an outbreak investigation showed that only 47% of the animals in the herd were vaccinated. Thirty eight unsafe curses field were identified in Koubia

Conclusion
Anthrax is endemic in Labé region with a predominance of cases in Koranic students. More than three quarters of cases in both humans and animals were from Koubia district where no cursed fields are secure. Educate population focusing on Koranic at schools on anthrax, organize vaccination campaigns for livestock especially in Koubia and protect the unsafe curses fields are the main recommendations to eliminate anthrax in the region
Human Monkey Pox Epidemic: Epidemiology, Characteristics and Public Health Implications - Cameroon, May-June 2018

Dr. priscilla ANYA, Dr. Patricia MENJIME, Dr. Messe Prosper, Dr. Franck AMABO CHI, Dr. Charles KWECHE PETCHU, Dr. Kingsley OMBAKU, Dr. Soreya DAWA, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA

Background
On April 30th 2018, two suspected Monkey pox (Mpx) cases were notified from Njikwa Health District (HD) in the North-West region. Preliminary investigations revealed other suspected cases (SC) from Akwaya HD in the South-West region. Both HDs are facing security crises and share borders with Nigerian states which reported confirmed Mpx cases on January 2018. We conducted an investigation to confirm the epidemic and initiate prevention and control measures.

Methods
We conducted a cross-sectional study in May 2018 in Njikwa and Akwaya HDs. We collected data on sociodemographic characteristics, clinical signs, contact with sick animals/human cases and travel information. Active community case search based on reviewed registers in health facilities was done and contact tracing was initiated. A SC was anyone living in Njikwa or Akwaya presenting with fever (≥38.5°C) and rash with/without headache, lymphadenopathy as from January 20th to the date of investigation. A confirmed case was anyone with a positive laboratory exam (PCR), and a contact was any asymptomatic person having contact with a case. “Centre Pasteur of Cameroon” analysed blood samples and skin biopsies collected from cases. We analysed data using Microsoft Excel 2013 and EPI INFO 7.

Results
Of 25 SC reviewed, only a 20 years old student/hunter living in Njikwa HD was still presenting active lesions. Women represented 24% (6/25), pupils/students 64% (16/25), and health staff 8% (2/25). Previous contact with an ill person before disease onset was recorded in 56% (14/25). No recent contact with a sick animal or travel was reported. Of 16/25 blood samples and skin swaps collected, Mpx virus (West African Strain similar to Nigeria) was isolated in a case. We identified 61 contacts who were not traced.

Conclusion
A Mpx case was confirmed in Njikwa HD. The source was not identified and contact tracing not done. We recommend a large-scale investigation with the support of law enforcement and sensitization of the population.

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 498

Mrs. Concepcion Esmeralda Barrera, Mrs. Nadia Competiello, Mr. Victor Calvo, Mrs. Gabriela Larco, Ms. Marisa Rodriguez, Mrs. Paula Leon, Mrs. Velen Pennini, Mrs. Sofia Armendariz, Mrs. Pilar Barcena Barbeira, Mrs. Camila Dominguez, Mr. Emiliano Biondo, Mr. Jorge Diaz, Mrs. Carolina Betancourt, Mrs. Malen Torres, Mrs. Vanesa Serrat, Mrs. Analia Iturra, Ms. Julieta Levite, Ms. Maria Laura Recoder, Mrs. Teresa Strella, Ms. Patricia Angeleri, Mr. Jorge Elías, Mr. Pablo Noveau

Background
Between November and first days of December 2018, 5 cases of Andes Hantavirus were reported, one of them deceased. On December 5, an outbreak was declared, when an epidemiological link with the index case was established. Given the subsequent appearance of new cases, on December 13 the hypothesis of person to person transmission was proposed. The only known antecedent being the 1996 outbreak in El Bolsón, Río Negro province, Argentina, with similar characteristics, but where the epidemiological link had not been clearly identified.

Objective: Characterize the Andes Hantavirus outbreak in Epuyén between November 2018 and March 2019.

Methods
Cross-sectional descriptive study. Semi-structured and in depth interviews were carried out with cases and contacts to clarify the epidemiological link and establish transmission dynamic. Blood samples were analyzed for detection of viral genome by RT-PCR for confirmation and the complete sequencing of the genome was obtained by Next-Generation Sequencing. The ambiental risk of transmission was assessed by direct observation and rodent capture.

Results
The outbreak counted 34 Hantavirus cases (20 female, 14 male), with eleven deceases. The overall fatality rate was of 32.4%, with differences between sexes, (21% in men and 40% in women). The median incubation period was 21 days. The epidemiological link was established in 32 cases. All cases had been exposed at least 30 minutes to an infected person, within the first two days of the beginning of fever and were mostly cohabitants or had coincided at a social event. No health workers were infected. The complete viral genome sequencing showed similarities higher than 99.9%. There was no evidence of the existence or presence of rodents related to secondary cases.

Conclusion
Person to person transmission was confirmed by epidemiological link, genome sequencing, and environmental research. This represents a challenge to further identify transmission period and viral shedding routes with higher load. All close contacts exposed to a confirmed case must be isolated during 45 days and biosecurity measures must be guaranteed.
Epidemiological Characteristics of human sporotrichosis - João Pessoa, Brazil, 2019

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 278

Ms. Danielle Lucena, Mr. Daniel Batista, Ms. Alexsandra Bezerra Monteiro de Oliveira, Ms. Martha Helena Cezar

Background
Sporotrichosis is a zoonosis caused by the fungus Sporothrix spp. In Brazil, transmission occurs mainly with felines. The observed complications are frequent in patients infected with the human immunodeficiency virus (HIV). In the patients identified in the State of Rio de Janeiro, Goiás and São Paulo, complications were observed in 40% of them and death in 6% in the period from 1992 to 2015. In João Pessoa-PB, the first patients appeared at the end of 2017. In this perspective, a field epidemiology study was started, whose scope was to know the epidemiological situation of human Sporotrichosis in the city of João Pessoa - Paraíba, integrating strategies of active search of sporotrichosis in humans and felines and to propose control measures.

Methods
Retrospective, exploratory study, whose instrument for epidemiological field investigation was elaborated using Epiinfo software and applied for review of medical records, laboratory test records and interviews with individuals who sought health services from January 2018 to May 2019, according to the following case definition: patient with lesion or multiple cutaneous lesions in lymphatic vessel pathways with epidemiological history of contact with diseased cat or manipulation of organic matter prior to the appearance of lesions. Data were compiled and analyzed in Epiinfo.

Results
A total of 1,360 records were reviewed, resulting in 472 suspects, of which 402 (85.2%) were confirmed by culture for fungi with Sporothrix spp identification, 63% were women, and the most affected age group was 30 to 39 years with 16.4%. Only 1% report not having had contact with animal, and 54% report contact with sick animal. There were no hospitalizations for complications, but 13% presented atypical forms such as ocular.

Conclusion
Knowledge of the magnitude and transcendence of human sporotrichosis, with consequent identification of pockets of transmission, has made Epidemiological and Environmental Surveillance, along with other institutional spaces for collaboration, instituted outpatient and laboratory reference, with a view to expanding to other health services and subsequent institution of compulsory municipal notification of suspected cases of human sporotrichosis, with a view to monitoring the dynamics of the disease in the territory.

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 454

Dr. magdalena kasika, Ms. Nsiande Lema, Dr. Ernatus M Mkupasi, Dr. Joseph Genchwere, Dr. Rogath Kishimba, Dr. Janneth Mghamba, Ms. Senga Sembuche

Background
Fascioliasis is a chronic parasitic disease causing economic losses in livestock production worldwide. In endemic areas, it is an emerging neglected zoonotic disease causing 2.4 million human cases globally. In Tanzania the prevalence of fascioliasis has been estimated to be 21% in humans, 17.8% to 94% in live cattle and up to 100% in some slaughter slabs. The main objectives of this study were to determine the prevalence of bovine fascioliasis and estimate financial losses in Bukoba Municipality.

Methods
Retrospective data analysis of meat inspection records between September 2012 to August 2017 was done. A total of 33,605 records of slaughtered cattle from five districts in Kagera were analyzed. A case of fascioliasis was defined as enlarged liver with bumpy, raised and/or depressed areas, hardness in consistency, enlarged bile ducts or presence of adult fasciola in the liver of slaughtered cattle in Kagera Region. Student's t-test was used to determine if the proportion of infected cattle changed over the years. Economic losses were estimated by determining the average number of cattle slaughtered per month, prevalence, average weight of a liver from mature cattle and selling price of liver per kilogram.

Results
Out of 33,605 cattle inspected and slaughtered between September 2012 to August 2017, 10,308 (30.6%) were infected and their liver condemned due to fascioliasis. The prevalence of fascioliasis calculated was 16.1% (872/5,411), 33.8% (2249/6644), 29.9% (1,870/6242), 28.9% (2239/7743), 40.6% (3078/7565) for 2012/2013, 2013/2014, 2014/2015, 2015/2016 and 2016/2017 respectively. The proportion of infected cattle did not change between 2012 and 2016 (p>0.05), however there was an increase in proportion of infected cattle between 2015/2016 and 2016/2017 (p<0.05). The estimated annual direct economic loss was US$ 42,191.9, equivalent to US$ 3,515.9 per month.

Conclusion
Fascioliasis is an important disease in Kagera region causing considerable loss of revenue. Development of helminth control strategy among cattle in this region should be considered. Further studies are needed to determine transmission among the human population in the same area.
Healthcare Associated Sepsis’s factors and outcomes observed during two outbreaks at Saint – Damien Hospital neonatal unit in Haiti, 2018 - 2019

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 557

Dr. Vanessa Jaelle Dor, Dr. Jacqueline Gautier, Dr. Omega Chery

Background
Healthcare Associated Infections (HAI) represent actually a critical problem in neonatal unit. Usually, the organisms involved are multidrug-resistant (MDR), increasing mortality rate and cost of care significantly. At Saint - Damien Hospital's Neonatal Unit, HAI sepsis are regularly suspected since 2014. In parallel, laboratory results with MDR organisms seem to increase yearly. This study aims to determine associated factors, microbiology and mortality rate of Healthcare Associated Sepsis (HAS) in the neonatal unit.

Methods
In this cross-sectional study, the population was infants with sepsis during outbreaks occurring at the unit from April 2018 to March 2019. HAIs, defined using Center for Disease Control and Prevention criteria were compared to Children with confirmed diagnosis of sepsis in the first 48 hours of life (Early Onset Sepsis). We present demographics, clinical, risk factors and microbiologic data collected in the surveillance system database, patients record and laboratory files. We also describe control measures implemented throughout this period. We performed bivariate analysis, logistic regression and we use Chi-square for proportions and T Student for means.

Results
There were two major outbreaks: May 2018 and January 2019, in which we counted 55 HAS and 50 EOS. Klebsiella Pneumoniae was the most common organism for HAS and presented a MDR profile in 66.67% of the samples. Ampicillin and Gentamycin resistance occurred in 95.65% and 78.26% respectively. Lethality rate of HAS was 76.47 % in May, 19.44 % in January. Low birth weight [OR: 3.07, CI 95% (1.31 – 7.20)], severe thrombocytopenia [OR: 9.58, CI 95% (1.16-78.66)] were associated factors identified. After first outbreak: hand hygiene was reinforced, annual formations curricula, and specific measures for environmental control in the unit were established.

Conclusion
HAS in the Neonatal Unit, were mostly caused by MDR Klebsiella Pneumoniae. affecting first line antibiotics used for neonatal sepsis management at Saint-Damien. However, mortality rate decrease significantly during the second outbreak. Early diagnosis of HAS, strengthening of infection control measures prove themselves effective to decrease lethality. We strongly recommend annual antibiotic susceptibility testing to adjust antibiotics protocols. A National Epidemiological and Microbiological surveillance is needed to help control and decrease the burden of HAS in Haiti.
Risk factors and genomic investigation of a cluster of Carababenemase producing Klebsiella Pneumoniae at a tertiary hospital ICUs-Egypt, 2016-2017

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 172

Dr. Saly Wagdy, Dr. Adel Mansour, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Background
Emergence and dissemination of Carababenemase producing Klebsiella pneumoniae (KPC-KP) representing serious threat at ICUs causing high morbidities, mortalities and outbreaks with limited treatment choices. Study was conducted in nine ICUs in Nasser Institute to identify risk factors and determine genomic relatedness of infection with KPC-KP.

Methods
All patients with healthcare associated infections (HAIs), January 2016-September 2017 were identified using case definition of Center for disease Control and prevention, and those caused by Klebsiella pneumoniae (HAI-KP) were detected and their KP median survival time (MST) calculated. Isolates were differentiated into KPC-KP and Carbapenem-susceptible KP (CS-KP) using Modified Hodge test. Pulsed field gel electrophoresis (PFGE) was done for 12 KPC-KP isolates for genomic fingerprinting. A matched case-control study was conducted for a subset of 42 cases with KPC-KP and 59 controls with CS-KP to identify risk factors for acquiring KPC-KP.

Results
A total of 421 HAIs including 204 (48.5%) caused by KP were identified, their mean age was 45±20 years, 60.8% were males. Among 204 HAIs caused by KP, 67 (32.3%) were KPC-KP including 19(45%) bloodstream, 15(36%) respiratory, 7(17%) urinary and 26(62%) surgical site infections. KPC-KP patients mean age was 46.6 ±21.6 years, 57% were males. Risk factors for acquiring KP-KPC were previous treatment with Carbapenems (OR=2.3, 95% CI: 1 - 5.4), comorbidity with cardiovascular disorders (OR=2, 95% CI: 1 - 4.5; P=.033). MST for cases and controls were 10±1.2 vs 10±0.8 day,(p=0.9). PFGE showed heterogeneous pattern (Dice coefficient = 18.87%).

Conclusion
Surveillance indicated that KP is the main cause HAIs in participating ICUs with high KPC production rate. Treatment with Carbapenems increases risk of KP- KPC infection within ICUs with no common source identified. Antimicrobial stewardship and antimicrobial use hospital guidelines could reduce rate of infection with KPC-KP. HAI and antimicrobial resistance surveillance should be maintained to follow KPC-KP trends and identify its risk factors within ICUs.
Trends of Drug Resistant Tuberculosis at Oshakati Namibia 2012-2016

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 485

Ms. Esther Mukete-Hilundutah, Prof. Kofi Nyarko

Background
Drug Resistant Tuberculosis (DR-TB) poses serious challenges for tuberculosis control. Worldwide, about 3% of all newly diagnosed patients have DR-TB. Namibia reported an increase in the notification of TB cases from 9,882 in 2014 to 9,944 in 2015, making the country one of the worst affected by TB in the world. Oshana region reported 527 TB cases in 2015 of which 42 were DR-TB. This study aimed at determining the trends of drug resistance tuberculosis and its associated factors.

Methods
A retrospective review of records was conducted. We reviewed data recorded from 2012 to 2016. Epi info 7 was used for data analysis and to determine the frequencies and proportions of the types of drug resistance and risk factors. Chi-square test for trends was performed at p-value < 0.05.

Results
Total of 194 DR-TB cases were identified from the records. Of these, 115 (59.28%) were male. The mean age was 37 (SD= 13.36). There were 180 (92.78%) Multidrug resistance, 7 (3.61%) Poly resistance, 6 (3.09%) Mono resistance and 1 (0.52%) Extensive drug resistance. Out of 194 DR-TB, 87 (44.85%) were cured and 20 (10.32%) defaulted. There were 103 (66.88%) patients from rural areas, 38 (24.68%) from Urban and 13 (8.44%) foreign nationals. The prevalence of DR-TB over the period was 194/588 (32.99%) and there was a general increase in DR-TB prevalence: 2012 was 32/873 (16.49 %) and increase to 40/619 (20.62 %) in 2013 and 46/581 (23.71%) in 2014 with slight decrease to 42/527 (21.65%) in 2015 and 34/588 (17.53%) in 2016 (p-value = 0.004).

Conclusion
DR-TB still remains a public health concern as new cases are being recorded. We recommended the Oshana Regional Health Directorate to conduct intensive health education on treatment adherence among Tuberculosis patients with regular follow-up and further analytical study to identify major determinants. We also recommended active case search in the community for early detection and curb the spread of the disease. Clinician sensitization on treatment adherence was also encouraged.
Treatment outcomes of multi-drug resistant tuberculosis and associated factors among patients at Iganga and Mbale treatment centres - Uganda: A retrospective cohort study

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 21

Ms. Diana Zemei, Dr. Esther Buregyeya, Dr. Stevens Kisaka

Background
In 2018, the Ministry of Health Uganda, reported an increase in MDR-TB patients from 600 in 2015 to 1900 in 2016. The emergence of multi-drug resistant tuberculosis (MDR-TB) threatens the existing efforts to eliminate tuberculosis due to the complex treatment thereof. Whilst treatment of MDR-TB is available, MDR-TB treatment outcomes and associated factors have not been well established. We aimed to describe the treatment outcomes, determine the factors associated with unsuccessful treatment outcomes and explore facilitators and barriers of treatment success of MDR-TB patients in Iganga and Mbale treatment centres, Uganda.

Methods
We conducted a retrospective cohort analysis of data from medical records of MDR-TB patients at Iganga and Mbale treatment centres for the period June 2013 to May 2018. We complemented the data with qualitative interviews from selected health workers and former patients. The qualitative data were analysed using thematic analysis. We performed Modified Poisson regression and mortality risk differences to determine the associations between factors and the treatment outcomes of MDR-TB using Stata 13.

Results
Of the 95 patients, 74 (77.9%) had successful outcomes (cured and treatment completed) and 21 (22.1%) had unsuccessful outcomes (died, lost to follow up and treatment failed). There were 62% males, 41% were between 30-44 years, 88% had history of tuberculosis treatment and 34% were HIV positive. Only HIV status was likely to be associated with unsuccessful outcomes at bivariate analysis CPR 3.35 (CI 1.4-8.09) and the mortality rate attributable to HIV infection was 60% for the five year period. Facilitators of treatment success included good communication and coordination mechanisms, availability of adherence enablers, self motivation and family support whereas barriers included delayed treatment initiation, alcohol consumption and stigma.

Conclusion
There was high treatment success of MDR-TB patients however the prevalence of unsuccessful outcomes particularly mortality was high and associated with HIV infection. This indicates the need to emphasise and improve MDR-TB/HIV collaborative services in order to attain better treatment outcomes.
Antibiotic prescription practices in primary healthcare settings—Georgia, 2017

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 244

Dr. Shorena Svanidze, Dr. Eka Khabazi, Dr. Nona Ephadze, Dr. Nato Nakashidze

Background
Growing antibiotic resistance is a global challenge public health. Antibiotic overuse contributes to this emerging problem. Information on antibiotic use in low-income countries is limited. National guidelines on antimicrobial treatment are lacking in Georgia. Due to limited laboratory bacteriological testing clinicians prescribe antibiotics without disease pathogen confirmation. Our study assessed antibiotic prescription practices by clinicians in outpatient setting in order to provide recommendations as needed.

Methods
We conducted cross-sectional study in Batumi - second largest city of Georgia. Seven of 17 outpatient clinics were randomly selected. Patients were interviewed with standard questionnaire. Diagnoses were verified in medical records and log-books. Interviewers documented dosage and duration for antimicrobial medication prescriptions. Medical diagnoses were coded with ICD-10 in the register. We calculated an compared antibiotic prescription prevalence ratios (PRs) for different ages and conditions. The study was conducted from September 1 to September 8, 2017.

Results
Out of 1065 selected visitors 603 (57%) were seeking medical care for different health issues. Antibiotic was prescribed to 89 (15%) out of 603 patients. Two or more different antibiotics were prescribed in 13 (15%) cases. The most frequent syndromes presented were respiratory events in 181 (30%), ENT in 81 (13%) and gastro-enteral in 74 (12%). Antibiotic most often was prescribed for urinary (27%), skin disorders (23%), and acute respiratory illnesses (ARI) (15%).

The most frequently prescribed antibiotics were: ß-lactamase inhibitor penicillins (24%), macrolides (17%), third generation cephalosporines (16%), and fluorochinolone 10%.

Out of 89 patients 63 (71%) were prescribed antibiotic only based on physical examination without any laboratory or instrumental investigation for infection confirmation.

No differences were found between various age groups by infection sites, except for respiratory events: children under 15 years old were 1.3 times more likely to receive antibiotics for respiratory events, than adults. Prevalence Ratio: PR=1.3 (95% confidence level, CI 1.1-1.7, p<0.001).

Conclusion
Study data showed not high rate of antibiotic prescription, second-line treatment medications are often used, and physicians do not conduct laboratory/instrumental examinations before prescribing antimicrobial drugs. We recommend to improve doctors' awareness on National Antimicrobial Treatment Guidelines and adherence to recommended antibiotic prescription practices.

Dr. Usman O Adekanye, Dr. A Ekiri, Dr. E Galipo, Dr. B Mohammed, Dr. Muhammad Shakir Balogun

Background
Antimicrobial resistance is a global health threat attributed to irrational antimicrobial use in humans and animals. To institute interventions aimed at promoting prudent and responsible antibiotic prescription by veterinarians, it is imperative to understand the factors associated with their empirical antibiotic prescribing (EAP). Consequently, we determined factors associated with EAP and antibiotic susceptibility testing (AST) among Nigerian veterinarians.

Methods
We conducted a cross-sectional study among registered veterinarians in Nigeria using pre-tested self-administered structured questionnaires delivered online with Qualitrics from 2nd January to 28th February 2019. Data were downloaded to MS Excel, cleaned, and exported to Epi info 7.2 for analysis. We generated frequencies and proportions. We determined factors associated with EAP and AST with chi-square tests and multivariable binary logistic regression to calculate adjusted odds ratios (aOR) and 95% confidence intervals (CI).

Results
Eighty percent of the 241 respondents were males. Age-group 25-34 years dominated (48%, 116). Out of 37 states in Nigeria, 2 (Yobe and Nasarawa) had no respondent while Abuja had the most (33, 14%). Only 20% of the respondents conducted AST frequently. Withdrawal period of antibiotics (aOR 0.4, 95% CI 0.3-0.8) and selecting antibiotics based on AST results aOR (0.3, 95% CI 0.2-0.6) were associated with empirical antibiotics prescription. Having a standardized protocol for treatment (aOR 3.3, 95% CI 1.0-10.5) and not having prior information of the farm or patient (aOR 0.4, 95% CI 0.2-0.7) were associated with conducting AST while long waiting time for AST results (aOR 0.5, 95% CI 0.3-0.9) was a barrier to conducting AST.

Conclusion
Our findings suggest that there is rational antibiotics prescription but low AST frequency among veterinarians in Nigeria. We recommend improvement in laboratory turn-around time to encourage AST among veterinarians. The findings were shared with the Veterinary Council of Nigeria for dissemination and further action.
Antimicrobials misuse in Egypt: A cross-sectional national survey for community pharmacy staff, 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 166

Dr. Rania Attia, Dr. Sahar Samy, Dr. Salma Afifi, Dr. Hanaa Ghonim

Background
Antimicrobial resistance (AMR) is a major global health problem induced mainly by antibiotic misuse. Dispensing Antibiotics without Medical Prescription (DAwMP) is common practice in developing countries including Egypt. There is an unforced decree prohibiting DAwMP in Egypt. This study aims at describing community pharmacy staff’s self-reported knowledge, attitude and practice about DAwMP.

Methods
A cross-sectional study targeting all Egyptian community pharmacists and their assistants conducted 7 July -6 August 2018. We used online structured, validated anonymous survey designed using Google forms. Survey consisted of 36 questions on socio-demographics, knowledge, attitude and practice towards DAwMP. Questionnaire distributed through Facebook, WhatsApp and e-mailing and scores calculated using Likert scale.

Results
A total of 519 pharmacy staff including 482 (92.9%) pharmacists and 37 (7.1%) assistants responded. Their mean age was 31.5±6 years, and 335 (64.5%) were females. The overall average knowledge score was 62.8%±2.7, it was significantly higher among pharmacists than assistants (63% vs 48%, p<0.000). Specific knowledge score about AMR was 494 (95.2%), and about the role of DAwMP in AMR was 431 (83.0%). Almost all respondents 503 (96.9%) have no knowledge about legal aspects of antibiotic dispensing in Egypt. More than half of respondents 299 (57.0%) disagreed with DAwMP, 367 (70.7%) think that poor healthcare utilization is the cause of DAwMP due to high expenditure of private health facilities. Most of respondents 497 (95.8%) reported that they dispensed antibiotics without a prescription on patient request, and 255 (49.1%) indicated they do not communicate with treating physician. Penicillin is the most frequently prescribed antibiotic 283 (54.5%) and upper respiratory infection is the most frequent diseases treated without prescription 394 (75.9%).

Conclusion
Study indicated high rates of DAwMP in community pharmacies in Egypt. Although staff is aware of the problem, yet self-medication is common due to poor healthcare utilization. Legislation enforcement, developing effective strategies to improve healthcare utilization in public health facilities and raising community awareness regarding hazards of antibiotic misuse could improve antibiotic dispensing practices in Egyptian community pharmacies.
Do Unmanned Aerial Vehicles reduce the duration and cost of transportation for diagnosis of multi-drug resistant tuberculosis? A Feasibility study – Chamba, Himachal Pradesh, India 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 239

Dr. Vishal Thakur, Mr. Lakshmanan Sundaramoorthy, Dr. Parasuraman Ganeshkumar

Background
Innovative technologies can solve complex public health problems. There was a need to reduce the turnaround time for diagnosis of tuberculosis in the hilly terrain of Chamba district of Himachal Pradesh. The objectives of our study were to determine the feasibility and efficacy in reduction of transportation time of unmanned aerial vehicle (UAV) for sputum transportation to diagnostic facility.

Methods
We designed a quasi experimental study. We used a likert-scale based questionnaire to interview stakeholders to measure acceptability, demand, implementation and practicality of using UAV. We compared the duration, distance and cost of transportation of sputum samples between UAV and motorcycle using 151 pilot runs between two designated coordinates. We used Wilcoxon Signed-rank test to compare median duration and distance.

Results
Thirty of 31 stakeholders felt that UAV was acceptable, practical and could be adapted as an alternate mode for sputum transportation for diagnosis of drug-resistant tuberculosis. All considered UAVs as a safe option. The median duration (IQR) for transporting sputum samples, including packing, loading, transportation and unloading, was 424 (48) and 1359 (279) seconds by UAV and motorcycle, respectively (p<0.001). UAV covered a median (IQR) distance of 2.89 (0.35) km compared to 12.09 (1.6) km by motorcycle (p<0.001). Recurrent cost per trip, including fuel and telecommunication/internet, was 0.34 USD for UAV compared to 96 USD for motorcycle.

Conclusion
UAVs provide a feasible, and time- and cost-saving alternative to conventional modes of transportation of sputum samples for diagnosis of multi-drug resistant tuberculosis in our setting. Further evaluation of UAVs under programmatic conditions may be considered by public health program managers so as to recommend its use for public health implementation.
Background
The Sylvanus Olympio Teaching Hospital realise several antibiograms and antibiotic resistance cases are detected but available data are underanalyzed. Our objective is to describe the profile of beta-lactam resistance of enterobacteria isolated in urinary tract infections at the Sylvanus Olympio Teaching Hospital.

Methods
We conducted a descriptive study on antibiogram results obtained in 2014 from enterobacterial strains. The antibiogram was performed on Mueller-Hinton agar medium by the disk diffusion method according to EUCAST recommendations. We determined different phenotypes by antibiogram interpretation.

Results
In 2014, out of 1072 urine samples analyzed, 171 (16%) were positive to bacteriological culture. Enterobacteria represented 91.81% of the isolates with *Escherichia coli* (71.97%), *Klebsiella pneumoniae* 22.30%, *Proteus spp* 3.18% and *Enterobacter spp* 2.55%. *Escherichia coli* strains presented 85.84% of the beta-lactam resistance phenotypes as following: 36.10% extended-spectrum beta-lactamase (ESBL), 25.77% high-level cephalosporinase, 13.40% low level Penicillinase, 10.30% high level Penicillinase, 9.28% low level cephalosporinase and 5.15% TRI Penicillinase inhibitors-resistant.

*Klebsiella pneumoniae* strains presented 80% beta-lactam resistance phenotypes as following: 67.86% ESBL, 17.86% high level cephalosporinase, 9.28% low level cephalosporinase and 5.15% TRI Penicillinase inhibitors-resistant, 3.57% of low level cephalosporinase.

Conclusion
ESBL phenotype was predominant among two species *Escherichia coli* and *Klebsiella pneumoniae* found in urinary tract infections. We recommend wide dissemination of these results to Sylvanus Olympio Teaching Hospital prescribers for a better management of urinary tract infections cases in Lomé. It is important to set up an antibiotics and antibiotic therapy management committee within the Hospital.

Background
Multidrug-resistant or Rifampicin-resistant tuberculosis (MDR/RR-TB) remains a threat to TB control and it is becoming increasingly difficult to treat in some countries. In 2015, WHO estimated that of the 10.4 million cases of TB worldwide, 3.9% were MDR/RR-TB. In the Gambia, there is no information on the current prevalence of Rifampicin Resistant Tuberculosis from the four sentinel sites where TB treatment occurs. We conducted this study to determine the prevalence of RR-TB from these sentinel sites.

Methods
We conducted a record review study in the four sentinel site for the period 2013-2018 in the Gambia. The Gambia has 7 regions and a population of 2,225,703. We reviewed and extracted data from national laboratory database where sensitivity test to the bacteria has been conducted. Variables extracted included disease status, age, sex, region, sensitivity test results and treatment status. Data was analyzed to determine frequencies, proportions, and rates.

Results
Between 2013-2018, a total of 1,350 sputum specimens were received from the four sentinel sites and analyzed for TB and Rifampicin resistance. 32.6% (441/1350) were mycobacterium Tuberculosis positive and out of which 7.0% (31/441) were Rifampicin-Resistant (RR-TB). Of the RR-TB, males were 65.2% (17/31) and the most affected age group was between 15-44years at 80.7% (25/31). Amongst the RR-TB, 48.3% (15/31) were bacteriologically confirmed and 19% (6/31) had HIV co-infection. Most of the cases peaked in 2015 with a RR-TB prevalence of 35%. Of the 7 regions in the country, the West Coast region had highest prevalence of 43.5%.

Conclusion
The prevalence of RR-TB was high and commoner in the West coast region of The Gambia. There is need for further studies to determine risk factors for RR-TB among TB patients undergoing treatment.

Keywords: Multidrug, Tuberculosis, Rifampicin, Resistance
Risk factors related to suicide attempts as predictors of suicide, Colombia, 2016-2017

Dr. Luz Castro, Ms. Marcela Muñoz, Dr. Oscar Eduardo Pacheco Garcia, Dr. Luis Fuertes

Background
Suicide attempts (SA) in Colombia had a rate of 51.8 per 100,000 population in 2017, while suicide had a rate of 10.0 x 100,000 population; being the third leading cause of death due to external causes, it is a mental and public health problem. The objective of the study was to identify the factors that are associated with deaths by suicide, and determine survival after the attempt.

Methods
Descriptive cross-section study. 42,594 records of the suicide attempts surveillance system databases, and 325 records of mortality by suicide in Colombia were analyzed. The risk factors were examined in two groups: one with SA and the other with suicide as the cause of death. A Chi-square test, multivariate analysis, and Bivariate logistic regression models were used to identify risk factors. Kaplan-Meier curves were used to analyze the survival. The Cox regression model was applied to analyze the variables related to suicide.

Results
Within 42,594 SA and 325 suicides in the period, a previous suicide attempt was the factor with the highest proportion of participation in both groups, with 31.2% and 27.7%, followed by suicidal ideation, relationship problems, and psychoactive substance abuse. In the multivariable model, belonging to the male sex (RO = 2.99, CI95% = 2.27-3.92), adulthood (over 29 years: RO = 2.38, CI95% = 1.90-2.99), living in rural areas (RO = 2.56, CI95% = 2.04-3.20) and chronic disease history (RO = 2.43, 95% CI = 1.55-2.41) are risk factors for suicide. Within the history of mental illness, the depression disorder (RO = 1.94 IC95% = 1.15-1.75) was a risk factor associated with suicide. 50% of suicide deaths occur up to 560 days after the suicide attempts.

Conclusion
Suicides and suicide attempts are two populations that share common conditions; however, there is a higher risk of suicide among those with depression disorder, a history of chronic diseases, exposure to workload, and male patients. It is necessary to strengthen mental health services to provide timely care to patients with these risk factors.
Incidence and Sociodemographic Predictors of Obesity among 6,349 Adults in China, 2010–2016: a Longitudinal Study

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 296

Ms. Yunting Xia, Dr. Jianhong Li, Dr. Yali Zhang

Background
In China, the prevalence of obesity had doubled from 7% in 2004 to 14% in 2013, and deaths from any cause attributable to high body mass index (BMI) increased from 301,231 in 1990 to 640,294 in 2013. Identifying individuals at risk of developing obesity is useful for informing preventive interventions. This study aimed to assess incidence and sociodemographic predictors of obesity in adults.

Methods
Data were from a longitudinal study of 10,421 non-obese (BMI<28.0, the Chinese specific cut-off points) individuals aged≥18 years who participated in the 2010 Chronic Disease and Risk Factor Surveillance in 10 provinces of China. Sociodemographic characteristics, height, and weight were collected by in-person interview and physical examination. 6,611 (63%) individuals were followed up in 2016, and 6,349 individuals (2,788 men and 3,561 women) with complete data were included for analysis. Multivariable log-binomial regression model was used to examine the predictors of obesity (BMI≥28.0).

Results
At baseline, 40% (2,544/6,349) of participants were overweight (BMI: 24.0–27.9), 58% (3,652/6,349) were normal weight (BMI: 18.5–23.9), and 2% (153/6,349) were underweight (BMI<18.5). During the 6 years of follow-up, 615 developed obesity with a cumulative incidence of 9.7%, which was higher in overweight individuals (17%, 428/2,544) than in normal weight (4.9%, 180/3,652) or underweight (4.6%, 7/153) individuals at baseline (c² = 247.2, P<0.01). After adjustment for weight status at baseline, those aged 18–44 years (aRR=1.7, 95%CI: 1.3–2.1), had a lower education level (aRR=1.4, 95%CI: 1.2–1.8), and rural residents (aRR=1.3, 95%CI: 1.1–1.5) were at significantly higher risk of developing obesity.

Conclusion
Approximately 10% of non-obese adults developed obesity over six years. Adults who were younger, with lower education and from rural location were more likely to develop obesity. Clinicians should know this public health information to target obesity prevention and increase public awareness of its consequences and promote a healthy lifestyle among those who were younger, less educated, and rural residents.
Knowledge, Attitude and Practices towards sickle cell screening among Health workers in Tororo District-Uganda, 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 268

Ms. Brenda Ayugi, Dr. Francis Xavier Kasujja, Prof. Fredrick Makumbi

Background
Tororo has a high prevalence (19.6%) of sickle cell trait compared to the national prevalence of 13.3%. In 2016, the Ministry of Health, Uganda rolled out a Sickle Cell Screening Programme (SCSP) for the new born children among health workers (HW) in Tororo district. Training focused on screening, diagnosis and management of sickle cell disease. We assessed HW's knowledge, attitude and practices towards SC screening 2 years following the roll out of the SCSP.

Methods
A cross sectional survey was conducted in June, 2018 among 180 HWs randomly selected from all (38) public health facilities. Knowledge was determined using 10 items from Uganda national sickle cell guidelines and data considered good for scores above 6 and poor for scores below 6. Attitude of HWs and practice on SC screening was explored through interviews conducted with 10 key informants and 10 in-depth interviewees. Sickle cell screening practice was based on 4 practice questions. Factors associated with good knowledge and practice were determined using prevalence ratios (PR) with corresponding 95% confidence intervals (CI) using a generalised linear model with the family of Poisson and a log link and robust standard error were obtained. Qualitative data were analysed using manual thematic analysis.

Results
Nearly two-thirds 116 (64.4%) of HWs were female and rural residents 113 (64.9%). Overall, knowledge about SC screening was low 125 (69.4%). Health workers cared and supported clients to screen for sickle cell, considered screening fully as their responsibility, and believed that screening prevented transmission of sickle cell genes to others. Only 62.2% reported screening clients for SC. Fifty one percent made client referrals, 36.5% did premarital counselling and 12.2% conducted SC awareness campaigns. Urban-residence (aPR=1.11, 95% CI; 1.03-1.19), higher income level (aPR= 1.30, 95% CI; 1.13-1.47) and prior training in SC screening (aPR= 1.09, 95% CI; 1.01-1.20) were key determinants of good knowledge.

Conclusion
Over all, knowledge and practice of SC screening is low. Attitude of HWs towards SC screening was positive. The District Health Office should carry out regular refresher training of HWs to improve HWs knowledge and practice of SC screening.
Association of Sedentary Time with Metabolic Syndrome Among Adults – China, 2013

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 302

Ms. Huimin Yan, Dr. Limin Wang, Dr. Yali Zhang, Ms. Yunting Xia

Background
Metabolic syndrome (MetS) is a group of risk factors when combined create a much higher likelihood of cardiovascular disease. In China, the prevalence of MetS almost doubled from 6% in 2002 to 11% in 2012. Sedentary time refers to sitting quietly watching TV, using the computer, playing video games, reading and other static behavior. There has been a growing interest in the relationship between time spent in sedentary behavior (sitting) and MetS, but there are little data on this topic in China. The purpose of this study was to assess the association between sedentary time and MetS among adults.

Methods
Data were collected from 174,974 individuals aged ≥18 years who participated in the 2013 Chronic Disease and Risk Factor Surveillance survey, in which multistage clustering sampling was adopted. Sedentary time during waking hours per day were obtained by face-to-face interviews. Waist circumference and blood pressure were measured; blood glucose and lipids were tested. MetS was defined as having ≥3 of the following: abdominal obesity, high blood glucose, high blood pressure, high triglyceride levels, low HDL cholesterol level. Complex sampling was weighted and multiple logistic regression model was used to assess the association between sedentary time and MetS.

Results
On average, Chinese adults spent 4.6 hours in sedentary behavior per day. 22% (95CI%: 21–23) of participants had MetS. Compared with individuals without MetS, those with MetS had a longer sedentary time (4.7±2.6 hours vs. 4.5±2.5 hours; t=15.0, P<0.01). Multivariate logistic regression model was used to adjust age, gender, education level, marital status, income, region, urban-rural, smoking, drinking, fruit and vegetable intake, red meat intake and physical activity levels. After adjustment for sociodemographic characteristics and behavior risk factors, those who had a sedentary time of 4–6 hours (aOR=1.07, 95%CI:1.02–1.12) or >6 hours per day (aOR=1.13, 95%CI:1.05–1.22) showed higher risk of MetS compared to those < 4 hours per day.

Conclusion
Greater sedentary times are associated with higher likelihood of MetS. Health education should be carried out to increase public awareness of risk factors for MetS and promote healthy lifestyle to improve metabolic health and reduce cardiovascular risk.
Childhood Cancer Survival Rate and Characteristics in Morocco: A retrospective Cohort, Hospital based Study

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 301

Dr. Ilham Dahbi, Prof. Laila Hessissn, Prof. Mohammed Khttab, Prof. Samir Ahid, Dr. Bouchra Assarag, Prof. Abdelmounim Belalia, Prof. Mohammed Adnane Tazi

Background
Childhood cancer is a major cause of death in children worldwide, about 60% of countries do not have quality population-based cancer registries. In Morocco about 1000 new cases of pediatric cancer are diagnosed each year and 30% of them are treated at the Pediatric Hematology-Oncology/Unit-Rabat. However we studied characteristics and survival rate of cases diagnosed between 2012-2014.

Methods
We conducted a retrospective cohort study including all children aged less than 15years old, who were admitted to the Pediatric Hemato-Oncology service (CHU-Rabat), who having a paraclinical confirmation of hematological malignancy or solid tumor. Data were collected from the medical records. All patients were observed until the end of March 2018 then parents were contacted or death register consulted to ascertain whether the child was still alive. Tumor types were grouped according to the International Classification (ICCC-3), Kaplan Meier’s method was used to calculate Overall Survival (OS), the log-rank test was used for the comparison of survival between the categories.

Results
Overall, 803 cases were collected. The male/female ratio was 1.2 and median age at diagnosis was 4.5 years; 89.5% had microscopic confirmation. Hematological malignancies were 45.1% of cases (leukemia 30.6%, lymphoma 13.3%); 65.8% of the leukemias were acute lymphoblastic leukemia (ALL) and 54.7% of the lymphomas were non-Hodgkin’s. Solid tumors were 54.8%, (Central Nervous System 11%, Renal 10.3% and Sympathetic Nervous System 9.3%).

During the follow-up period, 291 patients died. The OS rate of all cancers was 79%, 65.2%, and 63%, respectively at 1, 3 and 5 years. This OS at 5 year according to the gender was 65.5% for male and 60.7% for females (p = 0.098), and was not vary significantly by age at diagnosis.

Survival ALL had a better (66%) 5-year survival rate compared to other leukemias (p<0.001). OS was 84% for nephroblastoma, 81% for Hodgkin’s disease, 78.3% for retinoblastoma, 67.7% for glioma, 65.2% for osteosarcoma, 46% for sarcoma d’Ewing and 36.7% for neuroblastoma.

Conclusion
These results constitute a paramount indication for implementing a project to improve outcomes for children with cancer in Morocco (in parallel to the Investment in health-care systems, resources, and diagnosis) reinforcing the actions: Prevention, Epidemiological Surveillance, and collaboration private-public.
Survival and Its Predictors among Colo-Rectal Cancer Patients in Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia, 2012-2016: Hospital-Based Retrospective Cohort Study

Mr. Mohammed Ahmed, Mr. Aman Yesuf, Dr. Jilcha Dirbi, Dr. Mamo Wubshet

Background
Colorectal cancer (CRC) is the 3rd and 4th leading cause of morbidity and mortality worldwide. Without a national CRC screening program, it is the 4th leading cause of morbidity and mortality in Ethiopia. Furthermore, there is limited evidence on the predictors of survival of CRC patients. We estimated survival time and identified predictors for colorectal cancer.

Methods
We conducted a hospital-based retrospective cohort study. We used the American Joint Committee of Cancer 7th Edition for staging. We recruited a total of 161 biopsy-proven CRC patients who started treatment between January 2012 to December 2016 in Tikur Anbessa Specialized Hospital were included. Kaplan-Meier product-limit technique and Cox's regression analysis used to determine predictors of survival and estimate survival time. We presented findings using adjusted hazard ratios (AHR) with 95 %CI.

Results
We found that 47.8% (77/161) were stage IV followed by stage II 35.4% (57/161), with 96% adenocarcinoma (156/161) histologic type. The median age was 45 years with an interquartile range of 22 years. The median survival time was 21 months, with overall five-year and one-year survival rates of 34.7% and 71.9%. We found that colorectal surgery (AHR =3.37, 95%CI:1.32-8.57), carcinoembryonic antigen (CEA) levels >5ng/ml (AHR=2.01, 95%CI: 1.14-3.57), mucinous/singent cell carcinoma vs. adenocarcinoma (AHR=3.52, 95%CI:2.08-14.67), and distant metastasis (AHR=2.8, 95%CI:1.32-3.94) predicted death, while chemotherapy (AHR= 0.52, 95%CI: 0.27-0.98) predicted survival.

Conclusion
The survival rate of CRC patients decreased with increased duration of disease. Chemotherapy improved survival, while histologic type, surgery, distant metastasis, and elevated baseline CEA levels were all strong predictors of CRC death. Early screening and diagnosis of CRC patients, with rapid initiation of chemotherapy, will prolong the patient survival.
Timing of Diagnosis among patients with Prostate Cancer at the Uganda Cancer Institute

Mr. Nelson Bunani, Dr. Aloysius Ssenyonyjo, Mr. Steven Ssendagire, Ms. Angela Kisakye, Prof. Fred Nuwaha

Background
Late diagnosis of prostate cancer is common in Uganda and elsewhere. Diagnosis in advanced stages is associated with high mortality, morbidity and low quality of life. We estimated the time taken from perception of symptoms attributable to prostate cancer to biopsy among patients with prostate cancer at the Uganda Cancer Institute (UCI) and the associated factors.

Methods
We conducted a retrospective cohort analysis of records of 280 patients with a histologically confirmed diagnosis of prostate cancer at UCI from January 2016 to December 2017. Time to diagnosis was obtained from the difference between approximate date of onset of initial symptoms and date when a biopsy was taken. Late diagnosis was when an individual was diagnosed with prostate cancer stage III or IV whereas stages I and II were classified as early. We used modified poisson regression to assess factors associated with timing of diagnosis among the patients.

Results
The median time from first perceived symptoms to biopsy was 12 (IQR5-24) months and 76% were diagnosed after 4 months of symptoms. Median age at the time of diagnosis of patients was 70 (IQR66-74.5) years and at least 50% were aged between 65-74 years. About 81.8% of the patients were diagnosed late; of which 35.7% were in stage III and 46.1% were in stage IV. Most patients presented with raised prostate specific antigen with a median prostate specific antigen of 100.2 (IQR36.02-350) ng/ml of blood at the time of admission. In adjusted analysis, patients whose biopsies were taken before 5 months of recognizing symptoms were 1.31 times more likely to have cancer stage I or II compared to those patients whose biopsies were taken after 4 months (adjusted RR 1.31, 95% CI 1.10-1.56).

Conclusion
More than three in four patients were diagnosed late. Taking a biopsy after 4 months of initiation of symptoms was partially responsible for late diagnosis. To improve time to diagnosis, communities should be educated about symptoms of prostate cancer and advised to seek health care early. Health care workers should be sensitized to suspect prostate cancer among patients to allow timely referral for appropriate specialized assessment and management.
Prevalence of Shisha Smoking, Knowledge of its Health Consequences and Associated Factors among Students of a Tertiary Institution in Ibadan – Nigeria, 2019

Dr. Olukorede Ikwunne, Prof. Ikeoluwapo Ajayi, Dr. Oyindamola YUSUF, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Background
Tobacco smoking kills about seven million people annually. It is projected that annual deaths could rise to more than eight million by 2030. Water-pipe (Shisha) tobacco smoking is an emerging method of tobacco smoking in Nigeria, especially among young people. There is however limited information about its current use while misperceptions about its adverse health effects remain understudied. We, therefore, investigated the prevalence and factors associated with Shisha smoking and the knowledge of its health consequences among undergraduate students of a tertiary institution in Ibadan, Nigeria.

Methods
We conducted a descriptive cross-sectional study among 651 undergraduate students of a private university in southwestern Nigeria using a multi-stage cluster sampling technique. We collected socio-demographic and risk factor data from the respondents using a pretested self-administered questionnaire. We calculated frequencies, means, and proportions. We estimated adjusted odds ratios (AOR) and 95% confidence intervals (CI) to identify associated factors using multivariable logistic regression.

Results
The mean age of respondents was 20.7±4.67 years. One hundred and twenty-four (19.0%) respondents had ever smoked shisha while 33 (5.1%) were current shisha smokers. The mean age of initiation to shisha smoking was 18.3±2.7 years. Only 251 (38.6%) of the respondents had good knowledge about the health consequences of shisha tobacco smoking. First-year students were more likely to be current shisha users compared to those in the third year (AOR= 6.6; 95% CI= 1.5-28.1). Closeness to smokers of cigarette or other tobacco products was also a significant predictor of current shisha use among respondents (AOR= 4.2; 95% CI= 1.7-10.4).

Conclusion
We found a relatively high prevalence of shisha smoking with limited knowledge of its health consequences. Targeted tobacco prevention and cessation programs remain essential. We plan to implement a health education program in collaboration with the University management.
Combating the persistent cholera epidemic in the complex nomadic society of Northern Tanzania: The impact of enhanced targeted micro-scale interventions – Ngorongoro District, October 2018

Background
Since August 2015, Tanzania has experienced several waves of cholera outbreaks affecting all 26 regions. Despite several interventions by Ministry of the Health, Ngorongoro district in Arusha region has persistently reported cholera patients since April 2018. Periodic massive migration of Maasai people and their livestock in the area in search of pasture, as well as poor hygiene practices and inadequate access to safe water have hampered control efforts. We identified high-risk areas and implemented interventions to interrupt cholera transmission in this community.

Methods
During October 2018, we updated the cholera line-lists from 4 cholera treatment centers of Ngorongoro district and performed descriptive analysis to identify high-risk communities. We surveyed affected households to examine water treatment practice through testing drinking water using Free Residual Chlorine tester. We conducted rapid need assessment for drinking water using rapid rural appraisal techniques and identified partners to supply safe water. We conducted focused discussion with society elders (Laigwanans), community-based cholera committee was formed and trained on basic cholera control intervention to sustain and own the interventions. We distributed water treatment products and carried out environmental decontamination in high risk communities.

Results
During 6th October 2018, about 1,544 cholera cases were line-listed from Ngorongoro. The most affected villages were Nasiporiong (mean monthly incidence: 5.4/1,000), Esere (4.9/1,000), Kesile (3.9/1,000) and Ngoile (3.4/1,000). September was the month with highest incidence (5.1/1000) in a year 2018. A total of 15,000 water treatment tablets were distributed to 375 by October 2018. About 11,000L of clean and safe water was supplied each week to affected community. Following two weeks of intensive interventions Cholera incidence progressively decreased. Beginning October zero incidence was consistently reported and outbreak was successfully controlled and declared over by November.

Conclusion
Interventions to targeted communities were successful at interrupting cholera transmission during an outbreak in Ngorongoro district. Presence of extensive network of FETP residents and graduates who have demonstrated to have capacity to formulate and translate intervention in a way that are easily adaptable by local communities is a platform that local government authorities can utilize to curb emerging outbreaks and sustain intervention efforts.
Evaluation of surveillance system for measles – Morocco, 2017

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 363

Dr. FATIMA ZAHRA BENFOUILA, Ms. FATIMA ZAHRA MESKI, Dr. Ahmed RGUIG, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUMIM BELALIA, Prof. HICHAM NEJMI

Background
Measles is one of the leading causes of death among children under the age of five years in developing countries. The epidemiological surveillance has been strengthened in Morocco since 2010 to allow the disease elimination by 2020. The aim of this study was to describe measles national surveillance system, to analyze its data and evaluate its quality and timeliness during the periods 2010-2016.

Methods
We conducted a descriptive study using measles surveillance data including all suspected measles reported between January 2010 and December 2016. We have established indicators in accordance with the CDC, E-CDC Surveillance Systems Assessment Guideline and the WHO Measles Elimination Guideline in order to describe and evaluate measles surveillance system. Data quality was evaluated via the percentage of suspected measles for which all essential elements are available and the rate of discarded measles. The timeliness was examined through indicators such as the delay between onset of rash and notification and the rate of investigations initiated within 48 hours of notification.

Results
The surveillance of measles in Morocco is exhaustive and individual. Between 2010 and 2016, 4891 suspected measles were reported, including 1040 (21%) lab confirmed. Annual incidence in suspected measles, per 100 000 populations, decreased from 3.65 in 2010 to 0.52 in 2016. Among the ten most relevant variables for measles surveillance, date of investigation is the least filled with 89% missing data. The average notification delay was three days with a minimum of zero days and a maximum of 90 days. The percentage of suspected measles investigated within 48 hours of declaration was only 68% while the target was 80%.

Conclusion
According to these results and given the current context, our system does not meet all the objectives in phase of elimination. Some indicators are not meeting their targets, which imply that additional efforts will be needed to strengthen the surveillance system to achieve the disease elimination goal by 2020. In fact, professionals should be reminded of the obligation to report any suspect case of measles. Also, a computerized system for case notification should be set up.
Background
Approximately 80 species of nontuberculous mycobacteria (NTM) causing disease are found environmentally and in animal reservoirs. Typically, pulmonary NTM infections are sporadic; extrapulmonary infections are commonly outbreak-associated. Recent sources of extrapulmonary NTM (ENTM) outbreaks in Minnesota include contaminated heater-cooler units used during cardiac surgery and contaminated hormone injections. We examined patient demographics and characteristics of laboratory-confirmed ENTM isolates to assess potential value of systematic laboratory-based ENTM surveillance in Minnesota.

Methods
The Minnesota Department of Health requested laboratory data from *Mycobacterium* testing during 2013–2017 from 4 Minnesota reference laboratories that characterize *Mycobacterium* isolates. Using the CSTE case definition, we excluded *M. tuberculosis* complex, *M. bovis* and *M. leprae* isolates, and isolates from feces, lung, bronchoalveolar lavage, tracheal secretion, and sputum.

Results
Laboratories diagnosed 490 ENTM isolates, representing an estimated burden of 1.8 /100,000 people/year in Minnesota. Thirty-one species or complexes were identified; most common were *M. avium* complex (31.2%), *M. chelonae* (22.0%), *M. fortuitum* (10.6%), and *M. abscessus* (3.8%). Most common specimen collection sites included skin and soft tissue (38.4%), blood (15.3%), neck lymph node or tissue (11.8%), sinus (7.6%), joint or bone (5.1%), device or implant (3.7%) and eye (2.7%) infections. The patient’s median age was 55 years (range: 2–98 years); 18.4% were from patients aged <18 years, 19.5% aged 18–44 years, 28.2% aged 45–64 years and 33.9% aged >65 years. Sex was documented for 238 (48.6%) patients; 127 (53.4%) were males. County information was available for 313 isolates (63.9%); approximately half (48.8%) of patients resided in metropolitan Minneapolis-Saint Paul.

Conclusion
Laboratory data can be used for ENTM surveillance in Minnesota. Implementing laboratory-based surveillance could detect ENTM cases, provide a mechanism for obtaining clinical and epidemiological information, and enable earlier identification of potential healthcare transmission or community clusters.
Background
Kerala State in South India had established case-based diphtheria surveillance in 2015. In 2016, incidence of diphtheria recorded high after 10 years. Analysis of case-based diphtheria surveillance data from Kozhikode district of the State indicated shift in age to 5-14 years, increase in case fatality and low case confirmation. We evaluated the case-based surveillance system in Kozhikode in terms of key surveillance attributes.

Methods
We interviewed surveillance staff (n=35) at the district and sub district levels using a semi-structured questionnaire. We reviewed the case-based surveillance records, forms and reports for 2016-18. We adapted the guidelines on surveillance evaluation from Centers for Disease Control and Prevention, USA and European Center for Disease Prevention and Control to collect data on selected attributes. The attributes were representativeness (distribution), timeliness (reporting on time), completeness (of data), positive predictive value (proportion of reported cases, actually having diphtheria), simplicity (Structure &Ease of operation), acceptability (willingness to participate) and usefulness (contribution to prevention and control, effect on policies and programs) and were defined as in CDC 2001. Academic ethics committee of ICMR-National Institute of Epidemiology approved the protocol.

Results
According to the stakeholders, the system was simple (10 of 33; 31%) and acceptable (19 of 33; 58%), however, pointed to lack of dedicated permanent staff for surveillance at peripheral level. Positive predictive value was 42% (28 positives of 66 samples tested) in 2016 and 6% (7 of 119 tested) in 2017. The system was representative since all the 33 public and 67 private sector reporting units were submitting reports and maintained timeliness. The system was useful in detecting cases, analysis and response. However, overall completeness of the reports by its variables (n=26), was almost 85% in both 2016 (n=207 records) and 2017 (n=127 records) and was 35% in 2018 (n=36 records).

Conclusion
We documented that case-based surveillance system for diphtheria in Kozhikode district was representative, useful and timely. However, progressively declining positive predictive value and completeness needed immediate attention. The acceptability, despite being not simple, owes to the compulsive reporting. We recommended simplifying the reporting systems and augmenting the surveillance through training and designating peripheral (permanent) staff for surveillance.
Lesson Learned From Initial Effective Vaccine Management (EVM) Evaluation at Public Health Center in Boyolali District, Central Java Province-2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 200

Mr. Rido Illahi Ayef Eka Putra, Mr. Teguh Tri Kuncoro, Dr. Dibyo Pramono

Background
Since 2012, WHO recommends the EVM assessment to understand the vaccine quality and cold chain management program. Eventhough Boyolali has achieved universal coverage of immunization, vaccine preventable disease cases were still reported in 2018. This study aims to evaluate the distribution and stock vaccine management using the EVM tools in Public Health Center (PHC) at Boyolali district in 2018.

Methods
This is the descriptive observational study. The evaluation was conducted in August-November 2018. Fifteen of 27 PHCs were randomly selected in Boyolali district. Information was obtained through interviewing health officer using EVM WHO tools. Secondary data were collected from both Boyolali District Health Office and PHCs.

Results
There were 6 PHCs (40%) that have not implemented vaccine distribution in accordance with WHO guideline due to limited knowledge of the immunization officer related to the procedure of vaccine storage in cold-boxes and vaccine carriers. All PHCs do not have SOPs for arranging vaccines and cold-pack in vaccine carriers during cold chain management frequently harm the vaccine quality for children. All PHCs also have score less than 80% on vaccine stock management, this would give disadvantages for evaluating and monitoring vaccine control program in PHCs. In addition, manual recording system and incomplete record would be miscalculated information for arranging vaccine planning program in Boyolali District Health Office.

Conclusion
The distribution and vaccine stock management in PHCs in Boyolali District are still low. DHO should set SOPs for immunization officers related to vaccine distribution and stock management. Immunization officer must be trained how to packaging vaccine for support immunization program and arranged vaccine in cold box. Close monitoring of implementation SOPs and transform manual recording system into computerization system will support the improvement the quality of vaccine stock management.
**Evaluation of an illegal drug toxicity surveillance system - British Columbia, Canada, 2019**

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 290

Ms. Andrea Schertzer, Ms. Margot Kuo, Dr. Jane Buxton, Mr. Christopher Mill

**Background**

In 2016, British Columbia (BC) declared a public health emergency due to an increase in drug-related overdoses and deaths, primarily driven by illicit drugs. This allowed for rapid public health response, including surveillance of urine samples submitted by outpatient clinics for drug screening to private laboratories. Fentanyl positivity and analogue trends were identified and led to drug alerting and harm reduction messaging. This evaluation identifies current surveillance system advantages, limitations and reporting needs for future urine toxicology surveillance development.

**Methods**

We used CDC guidelines for evaluating surveillance systems and assessed the system’s utility, acceptability, timeliness, and representativeness. The population under surveillance were outpatients who submitted a urine drug screen sample to a participating laboratory. We conducted an online survey with end-users of the data (including public health and law enforcement). Five point likert scales were used to assess selected attributes. Open ended questions assessed limitations and benefits of the surveillance system. Qualitative data was analyzed using thematic content analysis.

**Results**

Thirty-seven of 93 end-users completed the survey (40%). They agreed or strongly agreed that this surveillance system was useful (84%), acceptable (89%), and timely (73%). Half found the data representative for their population of interest. Eighty-six percent of respondents reported that the system increased their awareness of toxic analogues circulating in the street drug supply. Limitations reported include: difficulty in interpreting data for public health action, biases in the population tested, and under-representation of geographic regions.

**Conclusion**

Respondents valued this system for its ability to inform on opioids being used in the community, and help plan public health messaging and harm reduction services. However, the system needs to improve its geographical representativeness and expand the population under surveillance. Since this surveillance system currently leverages outpatient clinical testing data, additional urine toxicology surveillance in new populations should be developed, especially in under-represented regions.
Factors associated with access to basic households’ water, sanitation and hygiene in Ngorongoro cholera epidemic villages-Arusha, 2019

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 436

Mr. Boniphace Jacob, Prof. Method Kazaura, Ms. Senga Sembuche

Background
Ngorongoro District reported 1007 cases of cholera and case fatality rate of 1.1% between April and August, 2018. The outbreak investigation teams reported that persistence was fuelled by inadequate and unsafe water as well as poor sanitation and hygiene. This study aimed to determine access to basic households’ Water, Sanitation and Hygiene (WASH) status and associated factors after interventions as a response to Cholera outbreak. It also provides recommendations on appropriate public health intervention to further improve WASH in the district.

Methods
The design was analytical cross-sectional. Study population was the heads of households who provided the current information on household water, sanitation and hygiene. Two-stage cluster sampling technique was used to recruit participants. Interview schedule and observational checklist was used to collect data. A household had access to basic WASH if had all three; drinking water treated, a toilet not shared with other household(s) and had functional hand washing facility.

Results
The mean age of participants was 36.3 (SD = 10.4) years. Majority, 307 (75%) were females. The average household size was 5.7 (SD = 2.5) and the mean number of households sharing one toilet was 4.8 (SD = 4.2). Respondents up to 403 (99.8%) had high knowledge on cholera, and 78 (19.6%) households had history of cholera cases with a total number of 145 cases and 8 deaths. Access to basic household WASH was only 33 (8%) and coverage of functional hand washing facilities was 49 (12.3%) despite of high coverage of sanitation facilities 353 (87.6%) and over 250 (60%) of drinking water treatment. However literatures indicate that before April 2018, the coverage of drinking water treatment, sanitation facilities and hand washing facilities was 7,706 (16.8%), 5,554 (20%) and 139 (0.5%) respectively. Access to basic household WASH increased with both, increased household monthly income and high level of education and vice versa.

Conclusion
Promotions of access to household WASH need to be integrated with strategies to overcome issues of “access” associated with income. Also interventions used to raise access to household WASH in Ngorongoro during outbreak can be adopted in other areas especially to nomadic community during cholera outbreak.
Analysis of SARI (Severe Acute Respiratory Infections) severity reported from surveillance sentinel sites in Turkey, 2015-2016

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 678

**Dr. Hamdiye Yilmaz Nemli, Dr. Selmur TOPAL, Dr. Fehminaz Temel, Dr. Gülen PEHLIVANTÜRK, Dr. Emine AVCI**

**Background**
Sentinel SARI surveillance was first established in Turkey during the 2015-2016 influenza season to monitor respiratory diseases due to influenza and other respiratory viruses leading to hospitalizations and deaths. We aimed to evaluate the findings of sentinel SARI surveillance and investigate the risk factors for deaths.

**Methods**
We evaluated 1948 SARI patients, reported to the Ministry of Health from week 40/2015 to 22/2016, from nine sentinel hospitals in five provinces. We collected data from case investigation and follow-up forms using SARI case definition of the World Health Organization. We linked laboratory data on viral respiratory pathogens to individual patient data. We conducted descriptive analysis of patients and risk factor analysis of death by age, pathogens, chronic disease, and ICU admission, using relative risks (RR) and 95% CI.

**Results**
Of the SARI patients, 56% were male, 31% were under 2 years old and 24% were 65 years and older. We identified influenza in 30%, other respiratory viruses (ORV) in 22%, and influenza and ORV coexistence in 2% of the patients. Forty six percent of the samples were negative for the viral agents. Among 23% of the patients in ICU, 23% had influenza and 25% had ORV. The highest fatality rates were respectively, among patients aged over 65 (18%), 50-64 (11%) and 15-49 (11%). Fatality rate by influenza pathogen was 14% in A/H1N1, 7.6% in A/H3N2 and 4% in B. Chronic disease was the main risk for death (RR:3.5, 95% CI:2.5-4.7). Among patients with chronic diseases, highest risk factors are influenza A H3N2 infection (RR:4.2 95% CI:1.2-14.6), and absence of transfer to ICU (RR:5.2 95% CI:2.8-9.6).

**Conclusion**
Fatality rate varies by age group, and type of viral strain. SARI surveillance is essential to monitor influenza severity in order to prioritize intervention such as referral of patients with chronic diseases to ICU.
**Tuberculosis Mortality in Lusaka, Zambia, 2016; Old Age, Health Facility Type and HIV Co-Infection as Associated Factors**

**Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 403**

*Mr. Francis Nanzalauka, Ms. Slyvia Chibuye, Ms. Clara Kasapo, Mrs. Nelia Mulambya*

**Background**
Lusaka is among the districts with high Tuberculosis (TB) notifications in Zambia, and the mortality proportion (6%) was exceeding the national target of less than 5% in the year 2015. Thus, we sought to look at risk factors for TB mortality among the routinely collected programmatic TB data in public health facilities.

**Methods**
We conducted a cross-sectional study in three purposively selected public health facilities in Lusaka; a 1st level hospital, an urban-clinic, and a peri-urban-clinic. We defined TB mortality as any TB patient who died for any reason during the course of treatment. We abstracted data from treatment registers for all TB cases on treatment from 1st January - 31st December 2016. We calculated mortality proportions for each facility. We used multivariable logistic regression to analyse the associations between TB mortality and age, health facility type or HIV status and reported adjusted odds ratios (AOR), and 95% confidence intervals (CI).

**Results**
We included 1,218 registered TB patients from the urban-clinic (43%), 1st level hospital (44%) and peri-urban-clinic (13%). Overall mortality proportion was 8%, and by facility: 7% (urban-clinic), 10% (1st level hospital) and 5% (peri-urban-clinic). The odds of TB mortality were higher among patients >64 years (AOR=7.5, 95%CI:1.9–29.0), patients who sought treatment at the 1st level hospital (AOR=1.6, 95%CI:1.1–2.4), and TB/HIV co-infected patients (AOR=3.0, 95%CI:1.9–4.9).

**Conclusion**
TB Mortality in the selected facilities was high compared to the national target. We recommended close monitoring of patients >64years old, and those who are HIV-positive, during the course of TB treatment. Prospective studies are needed to further understand the differences in mortality by health facility type, as well as identify and test targeted interventions to reduce mortality among TB patients.
Uganda Ebola Virus Disease Preparedness Assessment and Risk Mapping, August - September 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 15

Dr. Carol Nanziri, Ms. Vivian Ntono, Mr. Godfrey Nsereko, Dr. Fred Monje, Ms. Dativa Maria Aliddeki, Mr. Kenneth Bainomugisha, Ms. Lilian Bulage, Mr. Daniel Kadobera, Mr. Joshua Kayiwa, Dr. Patrick Tusiime, Dr. Eldard Mabumba, Mr. Michael Kibuule, Ms. Lydia Nakiire, Dr. Felix Ocom, Dr. Alex Riolexus Ario

Background
Uganda’s proximity to the epicentre of the 10th Ebola Virus Disease (EVD) outbreak in the Democratic Republic of Congo (DRC) poses high risk of EVD cross-border transmission. The World Health Organization (WHO) recommends EVD preparedness to prevent EVD importation and promote readiness for EVD response. We describe Uganda’s preparedness and risk-mapping to prevent EVD importation and limit spread from cross-border transmission.

Methods
We conducted interviews and group discussions with key informants using the WHO-consolidated EVD-preparedness checklist to assess district, health-facility, and points of entry (PoEs) preparedness. We focused questions on who, what, when and where to ascertain population characteristics and routes of movement from DRC into Uganda. We developed maps to show high-risk places and population movements from DRC. We computed percentages of accomplished core-capacities.

Results
We assessed 40 PoEs and > 80 health-facilities for preparedness in 12 high-priority districts. Ten of the 12 high-risk districts along the DRC border scored <50% preparedness in the 11 core-capacity domains. We identified 13 official and 27 unofficial PoEs and >500 places of high-risk for EVD transmission. We identified routes and congregation hubs including origins and destinations of travelers through PoEs to townships, markets, residences, schools, places of worship, health facilities, traditional shrines and workplaces. We developed a national EVD-preparedness and response plan using the assessment findings; and disseminated EVD information, education and communication (IEC) materials in >30 languages spoken in the high-risk districts. We built capacity for EVD surveillance, laboratory testing and treatment through training of health personnel, provision of supplies and construction of treatment units.

Conclusion
We identified gaps in EVD preparedness which were prioritized for capacity strengthening. We recommended maintenance of resources to sustain EVD preparedness at national and district level.
Background
The burden placed on Tuberculosis makes it a public health problem in Senegal with an incidence of 81 cases per 100,000 inhabitants in 2018, a detection rate 64% below the target set for Millennium Development Goal 6. Multidrug-resistant tuberculosis is marked by a recrudescence of cases. Its prevalence is 0.9% among new cases. The objective of this study was to describe the trend of tuberculosis in Senegal from 2009 to 2018.

Methods
We conducted a retrospective study of TB using surveillance data of the National Tuberculosis Control Program (NTP) registered from January 01, 2009 to December 31, 2018. All cases of pulmonary tuberculosis, extra-pulmonary, drug-resistant and non-drug-resistant TB were included. Aggregated TB data were extracted from an existing database and analyzed by person, place and time. Frequencies, proportions and confidence intervals were calculated using Excel and Epi info 7.2.2.6

Results
From 2009 to 2018 there were 128,836 tuberculosis cases of all forms, of which 68% (87,512) (95% CI = [67.67% - 68.18%) of new cases of pulmonary tuberculosis with positive microscopy (TPM + nc). The modal age group is [24-35 years] with 29.66% (29,521) (95% CI = [29.38% to 29.94%]. Men accounted for the majority of cases with 70% (61,310) (95% CI = [69.91% to 70.21%]). The Dakar region reported more cases with 44% (56,907) (95% CI = [43.93% - 44.44%]. From 2009 to 2018 the incidence per 100,000 population was 91, 87, 86, 93, 95, 95, 92, 86, 87 and 84 respectively. The 77% (99,451) (95% CI = [76.96% -77.42%] tested for HIV, of which 6.84% (6,807) (95% CI = [6.69% -7.00]) coinfected TB/VIH. TPM + nc recorded from 2009 to 2018 87% (74,597) of therapeutic success and 3% (2,696) lethality. Of 2339 TBMDR-tested cases, 11% (261) were resistant including 9% co-infected with TB / HIV, 4% of children under 14, 9% of contacts and 64% of restatements.

Conclusion
In Senegal, the incidence of tuberculosis has slightly decreased. But an increase was observed in 2013 and 2014. We recommended increased surveillance for tuberculosis and a follow-up on tuberculosis to avoid drug resistance.
Added Value of the Community-Event-Based Surveillance Approach In Disease Detection - Japoma Health District, Littoral Region, Cameroon, 2019

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 358

Dr. Jeanne Liliane MBENGUE, Dr. Tatiana DJIKEUSSI KATCHO, Dr. Victor KAME, Dr. Hans Dominic MOSSI MAKEMBE, Dr. Franck AMABO CHI, Dr. Yannick KAMGA, Dr. Armel EVOUNA, Dr. Rose-Carole BOHIMBO M., Dr. Serge BILLONG, Dr. J. DISSONGO, Dr. Georges Alain ETOUNDI MBALLA

Background
Event-based surveillance (EBS) aims to enhance the early detection of emerging public health threats and build health security in communities. In 2018, The Cameroon Ministry of Health, launched a Community-EBS pilot program in Japoma Health District (JHD) using community health workers (CHWs), to improve early warning functions of the existing surveillance system. The activity started in March 2018 and is ongoing. We analyzed data of this new system in JHD to describe relevant disease indicators and staff outcomes.

Methods
We analyzed the database from April 2018 to March 2019 in JHD. A list of priority diseases was defined and conditions designed on the basis of the probability and possible public health impact. A signal was defined as pattern of disease/information considered as a threat to human health and an event was manifestation of disease or an occurrence that creates a potential for disease. Every collected signal was registered in a standardized tool and transmitted directly by phone for timeliness purposes. Variables of interest were number of signals transmitted, number of detected events, timeliness of reporting, where and by whom signals were reported. We also collected data on implementation process such as training tools, transmission channel and supportive activities. Data collected were analyzed with Excel.

Results
Overall, 106 signals were collected amongst which 89/106 (84%) were transformed into events. 39/106 signals (37%) were notified on phone by 11 CHWs within 24 hours. Amongst them, two suspected cases of cholera, four neonatal deaths, five dog bites and 31 road accident were captured. An outbreak of scabies, a flood and gas release were investigated. Lack of essential EBS tools and poor staff mastery of initial EBS training were observed.

Conclusion
Overall, 106 signals were collected amongst which 89/106 (84%) were transformed into events. 39/106 signals (37%) were notified on phone by 11 CHWs within 24 hours. Amongst them, two suspected cases of cholera, four neonatal deaths, five dog bites and 31 road accident were captured. An outbreak of scabies, a flood and gas release were investigated. Lack of essential EBS tools and poor staff mastery of initial EBS training were observed.
Investigation of the public health event in the Cafunfu town, Lunda-norte, Angola in December 2017

Background
On November 22nd, 2017, the people from Cafunfu municipality in Lunda-Norte Province, alerted through the media, “the occurrence of unidentified disease, manifested mainly by high fevers, among other symptoms”. After verification of the alert, a multidisciplinary outbreak investigation team was sent to the town in December to investigate this public health event and determine the causal agent.

Methods
In order to investigate the etiology of this public health event, 370 febrile children were randomly selected for testing with rapid diagnostic tests (RDT) for malaria. Further, 25 RDT for dengue and chikungunya were performed. After confirmation of the etiology of the event a 1:2 age-matched case-control study was conducted in the neighborhoods of Elevação and Bala bala to evaluate for risk factors. The target population were children under 15 years old. The sample size was calculated using the EPI Info Calculator: 60 cases and 120 controls were recruited. Significance level was set at p<0.05 for all hypothesis tests.

Results
The RDT positivity rate was 70% for malaria, 9 RDTs were positive for Dengue and 3 for chikungunya. Of the 60 cases analyzed, 39 (65%) were male; 34 (57%)>5 years, 36 (60%) lived in Bala bala. The epidemic curve was typical of vector-borne disease and revealed significant under-reporting prior to the arrival of the external outbreak investigation teams. Logistic regression identified the following malaria infection associated factors: having an open dump close to home, OR of 11.3 [4.54-28.32] (p<0.001); not sleeping under mosquito net, OR = 16.3 [6.23-42.49] (p<0.001).

Conclusion
The upsurge in malaria cases was the trigger for the rumor that circulated through the media by the population of Cafunfu. Our study also showed co-circulation of Dengue and chikungunya. Control measures taken included: distribution of LLITNs; vector control strategies, improved case management. It was further recommended that local health authorities strengthen epidemiological surveillance system and vector control activities, improve basic sanitation, and develop risk communication strategies.
Health Workers’ Perception of Malaria Rapid Diagnostic Test and Factors Influencing Compliance with Test Results in Ebonyi State – Nigeria, 2017

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 629

Dr. IzuChukwu F Obi, Prof. Kabir Sabitu, Dr. Abdulhakeem Olorukooba, Dr. Ayo Adebowale, Dr. Rabi Usman, Dr. Ugochukwu Nwokoro, Dr. Olufemi Ajumobi, Prof. Suleiman Idris, Mr. Lawrence Nwankwo, Prof. Ikeoluwapo Ajayi, Dr. Muhammad Shakir Balogun

Background
The standard practice in treating uncomplicated malaria is to prescribe artemisinin-based combination therapy (ACT) for only patients with positive malaria rapid diagnostic test (mRDT) results. However, health workers (HWs) sometimes prescribe ACTs for patients with negative results. Available evidence on HWs’ perception of mRDT and their level of compliance with test results in Nigeria lacks adequate stratification by state and context. We assessed HW’s perception of mRDT and factors influencing ACTs prescription to patients with negative mRDT results in Ebonyi State, Nigeria.

Methods
We conducted a cross-sectional survey among 303 HWs treating suspected malaria patients in 40 randomly selected public (government owned) and private (missionary) health facilities in Ebonyi State. HWs’ perception of mRDT was assessed with 18 equally weighted five-point Likert scale questions with a maximum obtainable total score of 90. Scores ≥72 were graded as good perception and less, as poor. We analysed data using descriptive statistics and logistic regression model at 5% significance level.

Results
Mean age of respondents was 34.6±9.4 years, 229 (75.6%) were females, 180 (59.4%) community health workers and 67 (22.1%), medical doctors. Overall, 114 (37.6%) respondents across healthcare facility strata had poor perception of mRDT. One hundred and fifty-four (50.8%) respondents prescribed ACTs to patients with negative mRDT results within six months preceding the survey: primary healthcare facilities– 50 (42.4%), General hospitals– 18 (47.4%), tertiary facility– 51 (79.7%) and missionary hospitals– 35 (42.2%). Poor HWs’ perception of mRDT promoted prescription of ACT to patients with negative mRDT results (AOR=5.6, 95% CI= 3.2-9.9) as well as practice in public healthcare facilities (AOR=2.8, 95% CI= 1.4-5.5)

Conclusion
Poor perception of mRDT and prescribing of ACTs to patients with negative mRDT results were common among HWs in Ebonyi State. We recommended that the state malaria control program should target HWs in public healthcare facilities (especially the tertiary facility) with interventions aimed at improving their perception of mRDT and compliance with test results.
Enhanced surveillance of mosquitoes and vector-borne diseases in the Maltese Islands: Molecular species identification, insecticide resistance monitoring, and risk assessment for vector-borne infections (2018)

Dr. Raquel Medialdea Carrera, Dr. Tanya Melillo, Mr. Max Fotakis, Dr. John Vontas, Dr. Maria-Louise Borg

Background
Over the last decade, the combined influence of global travel, climate change, human migration and the spread of vector-borne infections like chikungunya, dengue, West Nile Virus (WNV) and malaria in Europe and North Africa, has made the spread of vector mosquitoes in Malta an urgent public health priority. We sought to identify competent vectors for infectious diseases in the Maltese islands, in order to inform public health response.

Methods
Entomological surveillance was conducted from July 2018 to February 2019 across Gozo and Malta with larvae, pupae and adult mosquitoes collected in 23 sites. From July to November 2018, egg density was measured weekly in 32 sites using ovitraps. Species were identified via morphological and molecular analyses. Insecticide resistance mutations were analysed in a partner laboratory in Greece. We analysed national surveillance data on vector-borne infections in Malta from 1990 to 2018.

Results
The species most frequently found were Culiseta longiareolata (9 sites), Culex pipiens s.s (8 sites), including the hybrid Cx. pipiens pipiens/molestus biotype (2 sites) and Aedes albopictus (4 sites). Neither Anopheles nor Ae. aegypti mosquitoes were detected. Mutations relevant for pyrethroid-based insecticide resistance were detected among 53% Culex (n=37) and 15% Aedes albopictus (n=17). No Diflubenzuron-resistant mutations were recorded. From January 1990 to December 2018, 103 malaria, 7 dengue, one chikungunya and no WNV cases were reported in Malta; with the exception of one cryptic Plasmodium falciparum infection reported in October 2018, all other mosquito-borne infections were travel-related.

Conclusion
This is the first molecular species identification and insecticide resistance analysis of mosquitoes from Malta. We demonstrated the presence and establishment across the Maltese islands of competent mosquito vectors for arboviruses such as West Nile Virus, Chikungunya or Dengue. The sustained presence of competent vectors for arboviruses prompted the implementation of vector-control strategies including community information campaigns to reduce breeding sites, controlled insecticide use by environmental health authorities, and enhanced surveillance to monitor the arrival and spread of mosquito species, and the emergence of insecticide-resistant mutations.
Chikungunya Fever Outbreak in a Candy-making Home Industry, Nagcarlan, Laguna, Philippines 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 219

Dr. Jessica Cagadas, Dr. Eugenia Mercedes Cañal, Ms. Precious May Gabalfin, Dr. Alethea De Guzman, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Background
In August 2018, the Epidemiology Bureau of the Department of Health received a report regarding clustering of suspect chikungunya cases in Nagcarlan, Laguna. We conducted an investigation to determine the existence of an outbreak and its source and identify risk factors.

Methods
We conducted a 1:2 case-control study. A suspect case was any previously well resident of Nagcarlan, Laguna with fever and joint pains from April 20-August 17, 2018. A confirmed case is a suspect case positive for chikungunya polymerase chain reaction (PCR). Active case finding and face-to-face interviews were done. A control is an asymptomatic resident negative for Chikungunya confirmatory test. Environmental and entomological surveys were conducted. Sera were collected.

Results
We identified 252 cases. None died. One hundred fifty-four (61%) were females. Age ranged from 2-73 years (Median=34). Rainfall started in April 2018. Barangay Taytay, with the highest attack rate (37 cases per 1,000 population), has numerous candy/delicacy-making home-based industries. Workers wearing only short pants and shirts aggregate inside houses that were mostly dark. Breeding sites observed were mixing pails, drums, and axilled plants. Fogging only done in one village. House and Breteau indices were higher than standard values. Twenty-three (51%) of 45 samples were positive for chikungunya virus. Risk factor was being a candy/delicacy home industry worker (OR=9.50, 95%CI=2.53-35.63). Wearing long pants (OR=0.54, 95%CI=0.29-0.96) was protective.

Conclusion
There was a chikungunya fever outbreak in Nagcarlan, Laguna. Entry of a viremic host from neighboring endemic areas may have been the source. Increased mosquito breeding sites and Aedes mosquito density, limited vector control measures, and poor practice of self-protection measures led to the outbreak. We should regularly conduct search and destroy activities in houses and workplaces. The community, especially industry workers and their employers, should know what appropriate self-protection measures to practice or institutionalize. Cases should be monitored, reported, and properly managed.
**Aggressive environmental control to stop the largest dengue fever outbreak in Hong Kong, 2018**

**Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 329**

*Dr. Ambrose Wong, Dr. Yonnie Lam, Dr. SK Chuang*

**Background**
Dengue fever (DF) was not endemic in Hong Kong, though sporadic cases of locally acquired DF were reported. In August 2018, the Centre for Health Protection (CHP) of Hong Kong recorded a DF outbreak in a local park named Lion Rock Park (LRP).

**Methods**
We reviewed notifications of DF cases received by CHP from May to October 2018. We defined locally-acquired case of DF as those who have dengue fever compatible symptoms with laboratory confirmation, and have not travelled to endemic area within 14 days of symptom onset. All locally-acquired cases with exposure to LRP or its surrounding area were included in the outbreak. We conducted epidemiological and laboratory investigations for all cases for epidemiological linkage, possible common exposure and common source of infection.

**Results**
We identified 19 cases in the outbreak. They involved 10 males and 9 females (47.3%) with median age of 55 years (17-78). They had onset of symptoms from August 2 to 20. Majority presented with fever (94.7%) and myalgia (89.5%). None had severe dengue complications. Eleven cases had DENV-1 virus with identical nucleotide sequence. The outbreak was established on August 15 when epidemiological investigation of 3 locally acquired DF cases revealed geographical linkage to LRP. Risk assessment suggested the park was the major source of infection and we promptly recommended closure of the park on August 17 for intensive anti-mosquito operation to stop the spread of the disease. The outbreak was effectively controlled after closure of the park with the last case had onset of symptoms on August 20. The outbreak was declared over on October 10.

**Conclusion**
Prompt anti-mosquito control can stop an evolving dengue fever outbreak. Prompt epidemiological investigation for early targeted control can help to prevent the disease becoming endemic in Hong Kong.
Factors Associated with Asymptomatic Malaria Infection among Primary School Pupils in Buhigwe District, Kigoma, Tanzania

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 414

Dr. PILI KIMANGA, Dr. Rogath Kishimba, Dr. Mucho Mizunduko, Mr. Frank Chacky, Dr. Billy Ngasala

Background
Asymptomatic malaria is prevalent in highly endemic areas of Africa and is a new challenge for malaria prevention and control strategies. This study aimed at determining the factors associated with asymptomatic malaria infection among primary school children in Buhigwe district.

Methods
This was a cross sectional study involving 341 pupils aged between 7-18 years. A four stage cluster sampling technique was used to select the participants. Data was collected using structured questionnaire for pupils and observational checklist during home visit. Study participants were subjected to malaria rapid diagnostic test (mRDTs). Malaria microscopy was used to identify the type of species. Data was entered, cleaned using Microsoft excel and analyzed using EPI Info software version 3.5.4 and 7.

Results
A total of 341 primary schools pupils were recruited in the study with 100% response rate. The mean age of pupils was 11 years with 2.7 Standard Deviation. The prevalence of asymptomatic malaria infection was 29%. Pupils below 11 years had two higher odds of malaria infection than older ones [Adjusted Odds Ratio (AOR) = 2.6; 95% Confidence Interval (CI) 1.53 – 4.46]. Boys had twice higher odds of malaria than girls [AOR = 2.1; 95% CI 1.25 – 3.51]. Outdoor activities and presence of stagnant water around home were found to increase the odds of malaria infection [AOR = 3.0; 95% CI 1.65 – 5.47].

Conclusion
The epidemiology of malaria is very complex, involving several factors. Since asymptomatic malaria infection is high in this age group (pupils) there is a need of regular/scheduled testing and treatment at schools. There is a need of joining forces between the health systems and education system. Furthermore continual public education in these endemic areas on preventive measures is highly needed.
Dengue Outbreak among Hospital Staff in a Government Hospital - National Capital Region, Philippines, September 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 204

Dr. Ma. Ivy Rozeth Saavedra-Iturralde, Dr. Eugenia Mercedes Cañal, Dr. Alethea De Guzman, Dr. Ma. Nemia Sucaldito, Dr. Ferchito Avelino

Background
Dengue is endemic in the Philippines. Outbreaks usually affect villages and cities. There has been no reported outbreak in hospital settings. In September 2018, report was received regarding dengue cases and alleged death among staff in a tertiary specialty hospital for children in the National Capital Region. FETP team was deployed to conduct an investigation to identify risk factors.

Methods
We conducted a 1:4 unmatched case-control study. A suspect case was any hospital staff with fever (2-7 days) and at least two of the following: rashes, joint pains, headache from January 1-September 28, 2018. Confirmed case is suspect case positive for dengue NS1, IgM enzyme-linked immunosorbent assay, and/or polymerase chain reaction. Control is an asymptomatic staff negative for dengue confirmatory test. We interviewed hospital staff, reviewed medical records of staff diagnosed with dengue, conducted environmental survey, and collected sera.

Results
A total of 15 cases was identified. One died (CFR:7%). There were 12 (80%) females. Age ranged from 25-46 years (Median=32). Eight (67%) were assigned in wards. A building is constructed adjacent to the hospital. A heavy, continuous rainfall occurred in July 2018 which collected water in excavation site. Cases peaked by mid-August. Breeding sites seen in construction area, under air conditioning units and dish drainers. Aedes mosquitoes were in wards, outpatient departments, and staff rooms. Fourteen (93%) were positive for dengue NS1 and/or IgM. Risk factors were assignment in wards (crude OR 5.38; 95% CI: 1.16-27.90) and staying in staff room (crude OR 47.00; 95% CI: 4.13-2203.97).

Conclusion
This is the first recorded dengue outbreak in a hospital in the Philippines. The presence of admitted dengue patients as source of infection and increased Aedes mosquitoes due to numerous breeding sites led to the outbreak. The hospital should map dengue high-risk areas, organize teams for vector control activities, ensure immediate, appropriate case management, and enhanced surveillance among patients and hospital employees. We recommended including vector-borne diseases as part of hospital-acquired infection surveillance.
Factors Associated with Private Health Facilities Reporting Malaria in the National Health Management Information System in Zambia: A Cross Sectional Study

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 409

Ms. Angela Gama

Background
Zambia’s goal is to eliminate malaria in the year 2021. This requires the malaria surveillance system to capture all cases from both the public and private sectors. However, less than 40% of private facilities report on malaria in the Health Management Information System (HMIS). This study investigated factors associated with private health facilities reporting malaria in HMIS.

Methods
A cross-sectional study was conducted in the year 2018, in three provinces where approximately 85% of private facilities are found in Zambia. Of the 304 private facilities offering malaria services, a sample size of 139 (CI: 95%) was determined. A questionnaire, which included questions on years of operation, human resource and malaria surveillance, was administered to the heads of the randomly selected private facilities. The outcome variable was reporting malaria in the HMIS (defined as a private facility that submits their monthly reports to the district health office). Multivariable logistic regression was applied.

Results
Data were collected from 139 private facilities. Few (n=12/139, 9%) private facilities had someone trained in malaria surveillance. Private facility that had ≥5 nurses (AOR=4.92, 95% CI: 2.03, 11.93; P-value <0.01), operated for ≥20 years (AOR=3.22, 95% CI: 1.23, 8.42; P-value 0.02) had increased odds of reporting malaria in the HMIS compared to those that had been operating for <20 years. The heads of the private facilities that were aware of malaria surveillance had increased odds of reporting malaria in the HMIS (AOR=2.06 95% CI: 1.38, 3.99, P-value 0.01) compared to those that were not aware.

Conclusion
The private facilities that had ≥5 nurses; operated for ≥20 years and the heads of the private facilities being aware of malaria surveillance was associated with reporting malaria in HMIS. We recommend increasing the number of staff and training of private providers on malaria surveillance to improve reporting in the HMIS.
An outbreak of Severe Fever with Thrombocytopenia Syndrome (SFTS) caused by human-to-human transmission in a hospital, Jiangsu, East China, 2018

Wednesday, 30th October - 15:30: Poster Session (Stone Mountain Ballroom) - Poster - Abstract ID: 343

Mr. zhong zhang, Ms. Zhaorui Chang, Ms. Jianli Hu, Mr. Tao Ma, Mr. Jianfeng Liu, Dr. Huihui Liu

Background
SFTS is an emerging infectious disease with a high case-fatality rate; it is caused by a novel type of Bunya virus (SFTSV) transmitted usually by ticks. On July 22nd, two medical workers with fever reported SFTSV positive in a hospital, where two confirmed SFTS cases died few days ago. An investigation was launched to identify the source of infection and risk factors so as to put forward control measures.

Methods
A suspect case was defined as medical workers, funeral attendees, relatives of two deceased cases and residents in the county who developed fever and one of the following symptoms from June 15- August 15, 2018: blood platelet<100×10^9/L, WBC<4×10^9/L. PCR and IgM test were used to confirm cases. Symptomatic monitoring was implemented in major medical facilities. Medical records were reviewed. Funerary attendees, identified SFTS cases and their family members were interviewed.

Results
9 cases were identified (all confirmed), including 2 deceased index cases (A1 and A2) and 7 secondary cases (4 ICU medical workers and 3 funeral attendees of A2). The main symptoms included fever (100%), muscle soreness(100%), fatigue(100%). A1 was probably bitten by a tick and got infected when walking along a wooded railways. A2 lived in a heavily-forested hill. She mistook ticks on her dogs for lice and often killed them with her naked nails. They were admitted to the same ICU successively. A2 developed hemorrhage and died soon. A traditional Chinese funeral was held for her subsequently, including body cleaning and funeral clothes dressing. Only 30%(8/27) of ICU workers wore gloves and masks during treatment of SFTS cases. Medical workers and funerary attendees of A2 were enrolled in a cohort study. The result showed that exposure to blood or blood-soiled coats/bedding was associated with getting infected (RR=15.5, 95% CI=3.5-69).

Conclusion
Poor protective precautions in the hospital caused nosocomial infection and subsequent improper handling of bleeding corpses led to funeral infection. It was rarely reported that nosocomial and funeral infection coexisted in an outbreak. We suggested that nosocomial protective precautions be enhanced and a guideline for traditional Chinese funeral be drawn up and distributed to avoid similar outbreaks in east China.
Session A: Vaccine-preventable Diseases; Moderators: David Sugerman, Sara Lowther; Thursday, 31 October 2019, 10:30am; Venue: Dogwood
Analysis of Measles surveillance data- Bangladesh, 2013-2017

Thursday, 31st October - 10:30: Session A: Vaccine-preventable Diseases (Dogwood) - Oral - Abstract ID: 108

Dr. Farzana Islam Khan, Dr. Mallick Masum Billah, Dr. Priyakanta Nayak, Dr. Sultan Md. Shamsuzzaman, Dr. Meerjady Sabrina Flora

Background
Bangladesh targets to eliminate measles by year 2020. Expanded Program on Immunization (EPI) in Bangladesh provides two doses of measles-rubella (MR) vaccine routinely at nine months and 15 months of age, since 2012. With technical support from World Health Organization, EPI conducts measles surveillance consisting of immediate case-based reporting along with weekly active and passive reporting from 768 static health facilities all over the country. Health facilities report suspected measles patients having fever and rash with any one of cough or coryza or conjunctivitis and send specimens to national laboratory for confirmation of measles and rubella. In 2016, surveillance reported increasing incidence of measles. Our objectives were to estimate the incidence of measles and to identify the risk population.

Methods
We analyzed the measles surveillance data of Bangladesh from 2013-2017. We defined confirmed measles as patients having either laboratory confirmation of measles or epidemiological link with laboratory confirmed measles patients. Measles incidence per 1,000,000 population was calculated and compared with vaccine coverage data. Z-test was performed for comparison of proportions in two groups. For a case control study, we defined non-measles, non-rubella patients from the surveillance as controls. Multivariable regression model was performed to identify high-risk groups. Odds ratio (OR) and 95% confidence interval (95%CI) was calculated.

Results
During 2013-2017, 20% (5,303/24,029) of suspected patients were confirmed for measles. The reported incidence of confirmed measles was 1.3/1,000,000 in 2013, which increased to 22/1,000,000 in 2017, the highest in five years. Among confirmed patients of 2017, 13.4% (482/3,594) were <9 months of age. We found 43% (1558/3,594) of confirmed measles patients between age 9 months-5 years and of them 21% (329/1558) completed vaccination as per schedule. Cities had higher incidence (51.7/1,000,000) than non-cities (18.7/1,000,000) [p-value<0.0001]. Dhaka city had highest incidence (83.6/1,000,000) in 2017 with lowest MR vaccine coverage (67.3%) in 2016. Unvaccinated children (OR=4.2, 95%CI=3.9-4.6), age <5 years (OR=2.4, 95%CI=2.3-2.6) and city-dwellers (OR=2.2, 95%CI=2.0-2.4) were more likely to develop measles.

Conclusion
The reported incidence of measles is increasing in Bangladesh in recent years. Vaccination program should identify factors for incomplete or no vaccination among eligible children and evaluate the vaccination strategies, especially in Dhaka.
Rate of and factors associate with parents’ refusal to give birth dose vaccines against Hepatitis B and Tuberculosis, Alamudun district, Kyrgyzstan, Jan–April 2019

Dr. Bermet Mamytkanova

Background
Kyrgyzstan public health authorities contributed the countrywide measles outbreaks that occurred in 2015 (~17,000 cases) and in 2018 (~3,000 cases) to low vaccine coverage, partially caused by parental refusal to vaccinate children (PRV). As a proxy measure of PRV in general, we studied the level and determinants of parental refusal regarding Hepatitis B and Tuberculosis birth-dose vaccination in a cohort of newborns in Alamudin District of Bishkek, Kyrgyzstan capital city.

Methods
We prospectively monitored hospital births that occurred during Dec 2018-April 2019 (99% of deliveries occur in hospitals). We enrolled in our study all live births without medical contraindication for vaccinating (n=530). We reviewed maternity records and interviewed mothers within three days of delivery to ascertain PRV. We also collected information on mothers’ socio-demographic characteristics, knowledge and attitudes towards vaccination; and access to health information on vaccination. We used conditional logistical regression to study the vaccination refusal-determinant associations.

Results
Overall, there was 5% (25/530) PRV in the study group. 22% (118/530) of mothers believed vaccines are nonessential and had the highest PRV: 15% (18/118). Relatively high PRV rate was observed among mothers with only school education 9% (11/120). The lowest PRV rate was 1.7% (7/405) among women who acknowledged the need to vaccinate newborns. In multivariate analysis, mothers’ belief that vaccines are nonessential (OR=15.3; 95% CI=4.8-48.8) and probably school education ((OR=2.7; 95% CI=0.9-7.8) were associated with higher PRV.

Conclusion
The rate of PRV is high among mothers who believe the vaccines are nonessential, or with only school education. We believe mother who refuse birth-dose vaccines because of their beliefs will probably refuse other childhood vaccines - this can lead to increase in the pool of susceptible and vaccine-preventable disease outbreaks. PRV can be reduced if health care providers address parental vaccine concerns and stress the benefits and safety of vaccination.
Measles Outbreak Investigation and Vaccination Coverage Assessment - Rey Bouba Health District, North Cameroon, April 2018: A Case-Control study

Thursday, 31st October - 11:10: Session A: Vaccine-preventable Diseases (Dogwood) - Oral - Abstract ID: 81

Dr. Gisèle Efouba Mvondo, Dr. MBELLA Maurice Rocher, Dr. Eric MBOKE EKOUM, Mr. Ndode Corlins, Dr. Natacha NSIEWE, Dr. Armel EVOUNA, Dr. Georges Alain ETOUNDI MBALLA

Background
Measles, the fourth leading cause of death among children <5years, is a disease under surveillance in Cameroon. The country experienced multiple outbreaks from 2016 to 2017. In March 23rd, 2018, the national reference laboratory confirmed seven cases of measles from a village in Rey Bouba Health District (HD) in north Cameroon. The outbreak investigation which took place from 13 to 20 April 2018, aimed to identify cases, risk factors and vaccination coverage.

Methods
We conducted a case-control study and a vaccination coverage assessment. A measles case was anyone living in Rey-Bouba HD with fever, generalized maculopapular rash and/or cough, cold conjunctivitis, having an epidemiological link with a case. We matched one case with one control from the same neighborhood sex and age. We reviewed consultation records in health facilities and searched cases in the community. We recorded age, sex, location and vaccination status. Vaccination coverage among all under 15years healthy children around cases was assessed through mother’s reports and/or vaccination card. We performed univariate and multivariate analysis using odds ratios with a 95% Confidence interval.

Results
Overall, we identified 68 cases from February to April 2018. One died, case fatality rate was 1.47%. Median age was 4 years [6 months-22 years]. Female/male Sex ratio was 1.2. A nomad camp had the second highest attack rate, 3.23%. Of the 55 cases with vaccination information, 76.3% (42/55) were unvaccinated. We matched 55 cases with 55 controls.

The risk factors were: contact with cases (OR=7, 95%CI [1.3-35.3]) and bad personal hygiene (OR=6, 95%CI [1.5-22]). Overall, we enrolled 254 <15years children to assess vaccination coverage. Vaccinated children represented 41% (104/254) and among 61% (63/104) of them, vaccination card was unavailable.

Conclusion
Contact with a sick person and bad personal hygiene were risk factors. Low immunization coverage in the HD could explain this measles outbreak. A vaccination campaign was recommended in this HD, especially in the nomad camp and strengthening of routine immunization.
Multiple source outbreak of influenza types A and B in a Basic School, Greater Accra Region, Ghana – 2018

Mr. Raymond Razak Mahama, Mr. Francis Sena Nuvey, Dr. Ekua Essumanma Houphouet, Dr. Priscillia Nortey, Dr. Gloria Akosua Ansa, Dr. Afua Asabea Amoabeng, Dr. Gifty Harriet, Dr. Ernest Kenu, Prof. Edwin Afari

Background
On September 25, 2018, a report was received of a suspected influenza outbreak among pupils of University of Ghana Basic School (UGBS). More than half of a class of 33 pupils were absent from school. They all reportedly had influenza-like illness (ILI) symptoms of fever and cough. We investigated the outbreak to determine its magnitude, causative agent and implement control measures.

Methods
We interviewed the pupils and school staff members and reviewed the school infirmary records for clinical features and date of illness onset. A case of suspected ILI was defined as any person in UGBS presenting with fever (history or temperature ≥ 37.5°C) and cough from September 23 to October 26, 2018. We conducted active case finding to identify more cases. We collected oropharyngeal samples from suspected cases for laboratory testing and conducted environmental assessment.

Results
Among the 1,642 school population, 75 persons including four staff members met the ILI case definition (attack rate = 4.6%). There was no death. Median age of case-patients was 9 years (range = 4-53 years) with 38 (50.7%) being males. The index case, a 9-year-old female pupil who had influenza B Victoria, shared a room with her sister who had cough, fever and sore throat seven days prior to her illness. Of 31 oropharyngeal samples tested, 15 (48.4%) tested positive for influenza B Victoria, 5 (16.1%) for influenza A H1N1pdm09 and 2 (6.5 %) for influenza A H3N2. All classrooms in the school had at least four windows per class and the school environment was generally clean.

Conclusion
A multiple source outbreak of influenza types A and B occurred among pupils and staff members of UGBS between September 23 and October 26, 2018. Health education and rapid implementation of hand hygiene protocols and cough etiquette helped to control the outbreak.
First Confirmed Pertussis Outbreak in Ethiopia - Daramallo District, GamoGofa Zone, Southern Ethiopia, 2018

Thursday, 31st October - 11:50: Session A: Vaccine-preventable Diseases (Dogwood) - Oral - Abstract ID: 373

Dr. Adugnaw Tasie, Mr. Girma Abate, Dr. David Sugerman, Mr. Diriba Gemechu, Mr. Mohammed Nasir, Mr. Hailemichael Bizuneh, Mr. Zewdu Assefa, Dr. Feyesa Regessa, Dr. Beyene Moges

Background
Pertussis is a highly contagious vaccine-preventable respiratory illness caused by *Bordetella pertussis* bacteria. Globally, 24.1 million cases and 160,700 deaths from pertussis were reported in 2014. Pertussis outbreaks were rarely reported in Ethiopia.

On August 29, 2018, a funeral attendee reported from a remote village in Southern Ethiopia to Zonal health department, three respiratory illness-related deaths in one family, suspicious for pertussis. We investigated the outbreak to confirm the etiology, describe risk factors, and implement control measures.

Methods
An unmatched case-control study was conducted between October 11- December 30, 2018 in Daramallo District, GamoGofa zone. A modified WHO suspected case definition was used to identify cases. About 100 cases and 100 asymptomatic household/neighbor controls were selected based on geographical accessibility and interviewed with a semi-structured questionnaire. 25 nasopharyngeal swabs were collected and tested with Real Time-Polymerase Chain Reaction (RT-PCR). We assessed district's immunization coverage and cold chain system. Simple and multiple binary logistic regression was performed.

Results
A total of 1,847 cases and six deaths were identified during the outbreak period, attack rate =26.5/1,000 population and case fatality rate =0.32%. Majority 67.2% (n=1,241) of cases were under five children. About 12.7% (235) cases were unvaccinated. Of 25 specimens tested with RT-PCR, 13 were positive for *Bordetella pertussis*bacteria. Half (12/24) of district health posts had non-functional cold chain. History of contact with a case (aOR=4.17; 95%CI: 1.89-9.18), time since last vaccination >4years (aOR=8.70; 95%CI: 2.34-32.4) and sex being female (aOR=3.43; 95%CI: 1.6-7.34) were the main identified risk factors while full immunization (aOR=0.31; 95%CI: 0.13-0.70) was protective.

Conclusion
This is laboratory confirmed pertussis outbreak, occurred primarily due to low DTP3 vaccination coverage. Contact with a case and time since last vaccination greater than four years (due to waning immunity) were associated with developing pertussis infection. To control this epidemic; case treatment, prophylaxis (family members and high risk contacts) with macrolide antibiotics and vaccination campaigns were conducted. To prevent future outbreaks cold chain and routine DTP3 coverage of the district should be improved.
National surveillance data analysis on Adverse Events Following Immunizations for Combined Diphtheria Tetanus and Acellular Pertussis Vaccine: China, 2015 -2017

Thursday, 31st October - 12:10: Session A: Vaccine-preventable Diseases (Dogwood) - Oral - Abstract ID: 299

Mr. Siquan Wang, Ms. Keli Li, Ms. Disha Xu, Dr. Lijie Zhang

Background
Combined diphtheria tetanus and acellular pertussis vaccine (DTaP) was the most widely used vaccine in China's immunization program. Its safety was recognized. But in 2017, the unqualified DTaP vaccine incident had aroused great public concern about its safety. With the continuous hype of this event, public confidence about vaccines had been a significant loss. In order to analyze the characteristics of Adverse Events Following Immunization (AEFI) after DTaP vaccination, evaluate its safety, eliminate public doubts and consolidate public confidence, the surveillance data of DTaP AEFI were analyzed.

Methods
AEFI referd to a response that may cause damage to the organs and tissues of vaccine recipients during or after vaccination and was suspected to be related to vaccination. The AEFI data included both common and rare reactions. This study collected AEFI data and vaccination data through China Immunization Program Information Management System. Excel and SPSS were used for the statistical analysis. The incidence and composition ratio of AEFI were analyzed by descriptive epidemiological method.

Results
From 2015 to 2017, 214 million doses of DTaP vaccine were administered and 170,743 AEFI cases were reported with an incidence was 80/100,000. Male to female ratio was 1.4:1. The fourth dose had the highest incidence (145/100,000). 90% of adverse reactions, which occurred less than 1 day after vaccination. The incidence of common reaction was 76/100,000, rare reaction was 2.7/100,000, severe rare reaction was 0.1/100,000. The top three rare reactions were allergic rash (2.2/100,000), vascular edema (0.2/100,000) and aseptic abscess (0.1/100,000). There were 32 cases of anaphylaxis (0.01/100,000) were in severe rare reaction, and 5 of them died of anaphylactic shock.

Conclusion
DTaP vaccine was safe, severe rare reactions were rare. In order to further reduce the impact of AEFI on the health of vaccine recipients, vaccinated doctors should strengthen the screening of vaccination contraindications, further standardize the vaccination operation, improve on-site first aid ability for anaphylaxis. Parents should take their children to be vaccinated in time, and do a good job of observation after vaccination.
Session B: Animal Health;
Moderators: Navneet Dhand, Julio Pinto;
Thursday, 31 October 2019, 10:30am; Venue: Cherry
Case-control study of zoonotic brucellosis in South of Morocco, 2017

Dr. HIND MAJIDI, Dr. FOUAD LAAKABI, Prof. Mohammed Adnane Tazi, Dr. Ahmed RGUIG, Dr. Hind EZZINE, Dr. Mohamed Lakranbi, Dr. IMAD CHERKAOUI, Dr. MOHAMMED YOUBI, Prof. Asmae Khattabi, Dr. BOUCHRA ASSARAG, Prof. ABDELMOUIN BELALIA, Prof. HICHAM NEJMI

Background
Brucellosis is a highly contagious zoonosis affecting domestic animals and human population. On 2nd June 2017, Laâyoune-Sakia-El Hamra Region (LSHR) notified an outbreak of human Brucellosis at the central level, and two FETP residents carried out to investigate this episode. The aim of this investigation is to assess the magnitude, evaluate risk factors and recommend control measures.

Methods
We conducted descriptive survey until September 13th, 2017, and population-based case control study between 05th-8th June 2017. A total of 24 consecutive patients with brucellosis attending the hospital in LSHR, were matched in respect of age and sex with 48 controls selected from the same place of residence than cases. Clinical and laboratory information’s on patients and controls was supplemented with occupational, food behaviors and socio-economic data obtained by interview of cases and controls using a standard questionnaire. Data analysis was performed using SPSS.20.1

Results
Between June 2nd and September 13th, 142 cases were reported at LSHR. The incidence rate was 38, 6 cases/100,000 inhabitants. The mean age was 42 years (1-87) with a female/male ratio 1:1. Two cases were hospitalized for osteoarticular complications. Two cases have been confirmed positive for Brucella bovis abortis in blood cultures. Serological confirmation (Wright tests) was positive in 61 %. The geospatial repartition of cases was around the dairy industry. After controlling for confounding factors, significant risk factors for infection related to the raw milk consumption (OR=14,07; IC = 2,7-76,1; P= 0,002) due to seasonal lactation period in cattle.

Conclusion
Active screening in humans and animals, culling infected animals, calves vaccination and sensibilisation for consumption behavior have been recommended. Infected persons were referred to a treatment center and the health service was notified. Cross-sectoral collaboration including “One heath concept “ is key to understanding and managing public health risks at the human-animal-environment interface and improving global health security.
Cutaneous Anthrax Outbreak Associated with Handling Dead Animals, Rhino Camp Sub-county, Arua District, Uganda, January-May 2018

Ms. Vivian Ntono, Mr. Daniel Eurien, Ms. Lilian Bulage, Mr. Daniel Kadobera, Dr. Alex Riolexus Ario

Background
On the 9 February 2018, Arua District notified Uganda Ministry of Health of a confirmed anthrax outbreak in Rhino-camp sub-county. We investigated to determine scope, mode of transmission and exposures for transmission of anthrax to guide control and prevention measures.

Methods
We defined a suspected cutaneous anthrax case as onset of skin lesions (e.g., papule, vesicle or eschar) in a person residing in Rhino Camp sub-county, Arua District from 25 December, 2017 to 31 May, 2018. A confirmed case was a suspected case with PCR-positivity for *Bacillus anthracis* from a clinical sample. We identified cases by reviewing medical records at Rhino Camp Health Centre. We also conducted additional case search in the affected community with support from Community Health Workers. In a retrospective cohort study, we interviewed all households in Ombeniva village. We collected and tested 3 samples of hides of implicated animals using an anthrax rapid diagnostic test.

Results
We identified 14 suspected case-patients (1 confirmed, 13 suspected); no deaths. Only males were affected (AR: 12/10,000). Mean age of case-persons was 33yrs (SD: 22). Epidemic curve showed one animal death a month which peaked in February, stagnated in March and April and sharply declined in May. The outbreak lasted 5 months, from Jan-2018 to May-2018. Two parishes were affected with Awuvu parish (AR=31/10,000) being more affected compared to Eranva parish (AR: 2/10,000). 10 (56%) of 18 people that participated in skinning a dead animal compared to 4 (12 %) of 33 people that did not participate in skinning developed cutaneous anthrax (RR=4.5, 95% CI=1.7-12.6). We found evidence of animal slaughter on pastureland.

Conclusion
Handling dead animals was associated with this cutaneous anthrax outbreak in Arua District. We recommended public education about safe disposal of carcasses of animals that die suddenly.
EFFECTIVE PUBLIC HEALTH ACTION FOLLOWING AN ANTHRAX OUTBREAK AMONG HIPPOPTAMI AND CAPE BUFFALOS IN BWABWATA NATIONAL PARK, NAMIBIA WITH NO HUMAN CASES, OCTOBER-NOVEMBER 2017

Thursday, 31st October - 11:10: Session B: Animal Health (Cherry) - Oral - Abstract ID: 491

Ms. Annyet Likando, Prof. Kofi Nyarko, Ms. Rebekka Shikesho, Ms. Iyaloo Mwaningange

Background

Anthrax is a zoonotic bacterial disease caused by *Bacillus anthracis*. Anthrax outbreaks in wildlife are known to cause human disease in sub-Saharan Africa. Humans are mostly infected through contact with or consuming meat from infected animal carcasses. A massive suspected anthrax outbreak in hippopotami and Cape buffalo was reported in Bwabwata National Park, Namibia in September 2017 by the Ministry of Environment and Tourism (MET). The objectives of our response were to confirm *B. anthracis* as the cause of the outbreak, identify human exposures, administer post-exposure prophylaxis (PEP), and perform community sensitization.

Methods

The investigation team consisted of FELT students, Ministries of Health, Agriculture (MOA) and MET staff, and CDC-Atlanta official. We collected samples from a subset of carcasses for confirmatory testing, we conducted household surveys to identify exposed people and administered PEP, and sensitized health care workers and community members. A suspected human case was defined as an illness suggestive of cutaneous, ingestion, or inhalational anthrax between 24th September– 21st October, 2017. Carcasses were disposed of by burial or incineration and livestock vaccination was performed by the MOA.

Results

*B. anthracis* was confirmed as the cause of the outbreak by molecular and histopathological methods. Our household surveys identified 125 people exposed to affected carcasses in the villages of Mwitjiku, Kamutjonga and Divayi that are within 1 kilometer proximity to the Bwabwata National Park. Of these, 66 (53%) were females and 78 (62%) were unaware that the meat was infected. Additionally, 94 (75%) of exposed respondents reported consuming meat and 54 (43%) reported touching a carcass. By the end of the outbreak on December 3, 1,050 people were sensitized and provided PEP and 243 wildlife carcasses were disposed of. No human cases were identified.

Conclusion

This investigation highlights a successful One-Health approach to an anthrax outbreak in wildlife. Affected communities were sensitized and provided PEP, area livestock were vaccinated, and interventions were implemented to control the outbreak. There was no transmission to humans or livestock following the prompt public health actions. We recommended continuous surveillance for anthrax.
Campylobacter Positivity and Public Health Risks in Live Bird Markets, Busia, Kenya, 2018

Thursday, 31st October - 11:30: Session B: Animal Health (Cherry) - Oral - Abstract ID: 245

Dr. Josephat Mbai, Dr. Mark Obonyo, Dr. Christina Otieno, Dr. Zeinab Gura, Dr. Maurice Owiny, Mr. Samuel Njoroge, Prof. Eric Fevre

Background
Campylobacter is one of the pathogenic zoonotic agents whose circulation is facilitated by conducive environment in Live Bird Markets (LBMs). Annually, it causes bloody diarrheal illness, loss of 33 million healthy life years with deaths in children and the immunosuppressed worldwide. Live poultry traders (LPTs) are at increased risk of infection due to regular contacts with poultry and incur high costs associated with management of the disease. The epidemiological role of LBM in Campylobacteriosis causation has not been well explored in Kenya. We sought to identify elements in LBMs that could contribute to risk of transmission of Campylobacter.

Methods
In a cross-sectional survey using multi-stage cluster sampling, we randomly selected LBMs and enrolled all LPTs in each selected LBM. We used an interviewer-administered questionnaire to collect information on socio-demographics, flock-structure, biosecurity and risk perceptions on Campylobacteriosis. Likert-scale type questions on transmission pathways were used to evaluate zoonotic-risk. Those who agreed with the risk pathways were awarded a score of “one” and “zero” for disagreement. A score > median categorized respondents as low-risk and ≤ median as high-risk. Campylobacter detection in individual cloacal samples was done through culture and PCR. We calculated descriptive and analytic statistics to correlate socio-demographics and practices to risk-status.

Results
We enrolled 14 LBMs and 186 LPTs; mean age 46.5 ± 13.7 years; 162 (87.1%) were males and 131 (70.4%) were aged between 25 – 54 years. On average, markets had 13 poultry sellers (IQR 8 – 17); 109 (58.6%) LPTs separated poultry species, 146 (78.5%) traded in backyard-poultry, 72 (38.9%) practised onsite-slaughter, 66 (35.5%) accessed handwashing facilities, 54 (29%) identified risk pathways. Of those with cages 126/176 (71.6%) had accumulated litter. Campylobacter positivity in live-birds was 43/112 (38.4%), 95% Confidence Interval (CI): 29.4 – 48.1. Accumulation of litter [prevalence Odds Ratio (pOR): 16.05, 95% CI: 3.67–70.17] was associated with zoonotic-risk. Access to hand-wash facilities [pOR: 0.38 95% CI: 0.18–0.78], access to information, [pOR: 0.19, 95% CI: 0.08–0.43] were protective.

Conclusion
Campylobacter was present in LBMs. Poor sanitary measures could expose LPTs and their customers to public health risks. Improvement of hygiene in LBMs and education on prevention are recommended.
Knowledge, attitude and practices on acaricide use in Uganda’s cattle corridor

Thursday, 31st October - 11:50: Session B: Animal Health (Cherry) - Oral - Abstract ID: 148

Ms. Phoebe Nabunya, Ms. Doreen Tuhebwe, Mr. Manaseh Anziku, Ms. Rachel Faith Mirembe, Mr. Bunjo Kiku, Ms. Phiona Epuli Mara, Mr. Peter Onyango, Ms. Caroline Achieng, Mr. Adams Kamukama, Dr. Herbert Bakiika, Ms. Grace Ruto, Ms. Angela Kisakye, Mr. Steven Ssendagire

Background
Uganda has experienced repeated outbreaks of Crimean Congo Hemorrhagic Fever (CCHF). Rational use of acaricides is an effective intervention in the control of ticks, the major vectors for CCHF among cattle. We assessed farmers’ knowledge, attitudes and practices on acaricide use in Nakasongola, Luwero, Gomba and Sembabule district in order to inform future interventions against tick control.

Methods
The study was a cross sectional study which employed a structured tool to collect information on farmers’ knowledge, attitude and practices on acaricide use. Farms ranging from backyard to large scale farms were visited. Stratified sampling was used to obtain a representative sample from each farm size per district. An overall score of at least 5/7 questions on knowledge, 7/10 questions on attitude and 6/8 questions on the recommended practices was considered adequate. Modified Poisson regression was used to identify factors independently associated with the farmers’ practices on acaricide use.

Results
A total of 403 respondents of whom 84.3% were males, 50.5% had attained primary education and 78.6% married with a mean age of 41.7±13.6 years were interviewed. Thirty two percent of the farmers had poor practices including using concentrated acaricide (28.3%), using acaricide in diluted form (28.3%) and using acaricide more frequently (35.5%) than recommended. Negative practices were more among male farmers (APR=0.18; 0.62-0.98), farmers with poor attitude towards acaricide effectiveness (APR=0.83; 0.72-0.95) and those aged 31-45 years of age (APR=0.84; 0.71-0.99). Veterinary shop owners were major source of information for farmers (87.1%).

Conclusion
Poor practices were more among the male and younger farmers aged 31-45 years and those with a negative attitude towards acaricide use. Since veterinary shop owners are the major source of information for the farmers, veterinary officers should therefore be trained about proper acaricide use as well as regulated to ensure that they follow the standard protocol recommendations in place.
Session C: Viral Hepatitis and HIV; Moderators: Alex de Voux, Lindsey Hiebert; Thursday, 31 October 2019, 10:30am; Venue: Poplar
Hepatitis A Vaccine Immunogenicity 25 Years After Vaccination in Alaska

Thursday, 31st October - 10:30: Session C: Viral Hepatitis and HIV (Poplar) - Oral - Abstract ID: 218

Dr. Maya Ramaswamy, Dr. Dana Bruden, Dr. Mary Snowball, Dr. Julie Morris, Dr. Philip Spradling, Dr. Noele Nelson, Dr. Michael Bruce, Dr. Brian McMahon

Background
The Hepatitis A vaccine is recommended for children ≥ 1 year old, however the duration of vaccine protection is unknown. In 1991, a cohort of Alaska Native children 3 to 6 years old was recruited to assess initial response to a 3-dose Hepatitis A vaccine series and the duration of protection. We report on the 25 year follow up of the cohort.

Methods
Participants were randomized to three different schedules: A) 0, 1, and 2 months; B) 0, 1, and 6 months; and C) 0, 1, and 12 months. We assessed IgG antibody concentrations to Hepatitis A virus (anti-HAV) every 2-3 years by calculating the geometric mean concentration (GMC) and proportion of participants with protective levels of anti-HAV (≥ 20 miU/ml) at each time point. We estimated the amount of time until anti-HAV dropped below protective levels using a Kaplan-Meier survival analysis.

Results
Of the 144 participants, 43 (29.9%) were available at the 25 year follow up period. There was a statistically significant lower GMC among participants who received vaccines on schedule A compared to schedules B and C (A=42.9 miU/ml vs B=100.6 vs C=176.5, P=0.004). Overall, 81.4% (35/43) of participants had protective levels of anti-HAV, a 5.6% decrease from the previous measurement at 22 years after vaccination. In a survival analysis, using data from the entire cohort, 78.7% of participants had protective levels of anti-HAV at 25 years.

Conclusion
At 25 years following the initial vaccination series, four of five of participants exhibit protective levels of anti-HAV. The high level of protective antibodies in this cohort indicate that supplemental doses of hepatitis A vaccine are not needed at or before 25 years after completion of the vaccine series.
Evaluation of the HIV Viral Load laboratory based Surveillance System and characterisation of Viral Suppression in a rural County - Kenya, 2015–2018

Thursday, 31st October - 10:50: Session C: Viral Hepatitis and HIV (Poplar) - Oral - Abstract ID: 383

Dr. festus kigen, Dr. Maurice Owiny, Mr. Moses Melita, Mr. Hosea Serech, Dr. Zeinab Gura

Background
Key among UNAIDS global targets to accelerate efforts towards control of HIV pandemic is viral suppression of 90% among patients on antiretroviral therapy. Viral suppression is important in disrupting HIV transmission. We evaluated the viral load surveillance system and characterized suppression of HIV as reported in the system.

Methods
We evaluated the surveillance system attributes such as data quality, acceptability using CDC guidelines and reviewed records in the national viral load database of HIV patients tested for viral load in Homabay County in Kenya from 2015–2018. Variables collected included age, gender and antiretroviral regimen. We abstracted data using standardized tool and descriptive statistics calculated. We categorized Patients with less than 1000 copies of HIV per ml as virally suppressed

Results
We reviewed 224,822 records. Overall 1.6% of records had missing information on sex and 0.4% on age. The Laboratory sample rejection rate was 0.35%. High acceptability demonstrated by facilities reporting rate of 93.9%. Mean age was 35.8 years (SD ±14.6). Overall, viral suppression rate changed from 83% in 2015 to 89% in 2018. Female suppression rates (86.3%) were higher than male (83.5%). Paediatric (66.5%) and adolescent (67%) suppression rates were lower than for adult (87.8%). Suppression rate in the age group 1–10 years was 64.4% while for 50–60 years was 91.2%. Most common antiretroviral regimen was TDF/3TC/EFV (58.8%) with suppression rate of 91.6% while for ABC/3TC/LPVr was 74.1%. The system lacks a feedback mechanism from the clinics on patients receiving results.

Conclusion
The system had high data quality level and acceptability. Female viral suppression rates were higher than male while paediatric and adolescent suppression rates were lower as compared to adult rates. Patients on TDF/3TC/EFV regimen had the highest suppression rates of 91.6%. We recommended use of viral load surveillance data in monitoring treatment success particularly of paediatric and adolescent patients. We recommend variable on patients receiving result be added.
Determinants of First Line Antiretroviral Treatment Failure among Patients on Highly Active Antiretroviral Therapy in Selected Public Hospitals - Jimma, Southwest Ethiopia a Case Control Study

Mr. amrachu bekele, Mr. Tamrat Shaweno, Dr. Lelisa Sena

Background
Highly Active Antiretroviral Therapy (HAART) has substantially declined morbidity and mortality related to Human immunodeficiency virus/Acquired immunodeficiency syndrome (HIV/AIDS). Nevertheless, the failure of first-line ART regimens has emerged as a growing concern. Identifying and managing determinants of first-line ART failure is of utmost importance to attain viral load suppression and is crucial to achieving the 90-90-90 treatment target. However, there is limited evidence on these determinants in Ethiopia and the study area. Accordingly, we assessed the determinants of first-line ART failure among patients attending ART in Public Hospitals Jimma, Southwest Ethiopia.

Methods
A case-control study was conducted in selected public hospitals Jimma, from March 1-26, 2018. A sample of 384 (288 controls and 96 cases) were recruited. All cases were enrolled in the study, but controls were selected using simple random sampling. A case was an HIV patient aged ≥15 years on a first-line ART regimen with a documented treatment failure (virologic, immunologic or clinical). Controls were HIV patients ≥15 years on a first-line ART regimen with no evidence of therapeutic failure. Data was collected by interviewer-administered questionnaires and extracted from an electronic database. Bivariate and multivariate logistic regression analysis was used. Adjusted odds ratios and 95% confidence intervals were used to report independent variables associated with first-line ART failure at P-value<0.05.

Results
In this study, higher odds of first-line ART failure was detected among urban residents (AOR:2.2; 95%CI: 1.1, 3.6), smokers (AOR:5.9; 95%CI:3.2, 10.8), Khat users (AOR:2.2; 95%CI:1.3,3.7), poor treatment adherents (AOR:2.2; 95%CI: 1.1,4.5), tuberculosis coinfection (AOR:3.9; 95%CI:2.2, 6.8), prior exposure to ART (AOR:3.8; 95%CI:1.7, 8.1), zidovudine based regimen (AOR:4.8; 95%CI: 2.5,9.0) and longer duration on ART more than 73 months (AOR:1.9; 95%CI:1.2, 3.3).

Conclusion
This study evidenced that being an urban resident, TB co-infection, poor treatment adherence, and zidovudine-based regiment were positively and independently associated with first-line ART failure. Thus, enhanced adherence counseling should be provided for those urban residents as well as substance users to improve adherence to ART; early screening and management of tuberculosis is highly recommended. Moreover, close follow up of adverse effects of ARVs must be strengthened.
Incidence of active tuberculosis and risk factors for HIV patients infected with HIV at the start of antiretroviral treatment in Luanda 2016-2017

Thursday, 31st October - 11:30: Session C: Viral Hepatitis and HIV (Poplar) - Oral - Abstract ID: 385

Dr. Luis Bandeira, Dr. Tazi Nimi, Dr. João Pires

Background

In 2017, an estimated 920,000 people living with HIV (PLHIV) have fallen ill with Tuberculosis (TB) worldwide. Angola is one of 20 countries with the highest estimated numbers of incident TB cases among PLHIV. The objective of this study was to assess the incidence and risk factors for active TB among HIV patients during the first 12 months of initial antiretroviral therapy (ART) in a tertiary HIV specialized hospital in Luanda, Angola.

Methods

A cohort study with a 1-year follow-up period was conducted among 267 HIV patients who started ART and who had a negative screening for active TB in 2016. The outcome was the development of active TB during the follow-up period. Semi-structured questionnaires and review of clinical files were used for data collection. Significance level was set at p<0.05 for all hypothesis tests. Pearson chi-squared (χ2) tests, followed by multivariable logistic regression modelling were used to identify factors associated with active TB.

Results

The incidence of active tuberculosis was 12.0% (32 patients out of the 267 followed during the 12-months period), from which 59.4% (19) were between 30-49 years old and 65.6% (21) were female. From those 32 patients, 75% (24) developed pulmonary tuberculosis, whereas the remaining developed other forms of active TB. Independent associated factors for active TB were: viral load higher than 10,000 copies [OR = 16.8; 95% CI: 1.7-70; p <0.001]; and having less than 2 meals per day [OR = 17.2; 95%: 2.1-40; p <0.01].

Conclusion

The high incidence of tuberculosis in HIV patients makes it urgent to implement strategies that lead to timely identification, treatment, prophylaxis and prevention of TB among HIV patients on ART. Our study reinforces the results of other colleagues in Angola that clearly show the urgent need for stringent Isoniazide prophylactic therapy policy implementation and increased coverage among HIV patients with a negative TB screening.
HIV prevalence among women presenting in maternity ward of Katima Mulilo Hospital, Zambezi Region, Namibia (2013-2017)

Thursday, 31st October - 11:50: Session C: Viral Hepatitis and HIV (Poplar) - Oral - Abstract ID: 482

Ms. Rosalia Nairenge, Prof. Kofi Nyarko

Background
HIV/AIDS is a major public health concern globally. In Africa 25.7 million people are infected with HIV. HIV Prevalence rate among pregnant women in Namibia is 17.2%. Zambezi region has the highest (32.9%) HIV/AIDS prevalence in Namibia. The aim of study was to determine the prevalence and trend of HIV among pregnant women in Katima Mulilo maternity ward, from 2013 to 2017.

Methods
We conducted a cross-sectional study and reviewed delivery registers in the maternity ward from 2013-2017. We defined a case as any HIV positive pregnant women who presented at Katima Mulilo maternity ward for delivery between 2013-2017. Variables reviewed included age, physical address, parity, HIV and Antiretroviral Therapy (ART) status. Data was analyzed using Epi info 7 software. We calculated frequencies and proportions of deliveries among HIV positive pregnant women. Statistical significance was determined at P-value <0.05.

Results
There were 11647 total deliveries recorded between 2013-2017 in Katima Mulilo maternity ward. At the time of delivery 3590 (30.8%) were HIV positive. HIV positive cases increased over the years: 336 (9.7%) in 2013, 759 (21%) in 2014, 915 (24%) in 2015, 1064 (26%) in 2016, and 1064 (26%) in 2017, with a p-value=0.001. Women 20-29 years of age had the highest 3451 (45%) HIV prevalence compared to other age groups (p-value=0.001). Overall, HIV prevalence was highest in multi-gravida 3070 (82%) compared to primi-gravida 695 (18%). Most HIV cases came from Chotto 501 (13%) and Cowboy residential areas 301 (8%). A total of 3078 (86.2%) HIV positive mothers were on ART for >4 weeks, 10 (0.3%) were on ART for <4 weeks, 345 (9.7%) were given a combination of Nevirapine, Zidovudine and Lamivudine at onset of labour, 130 (3.6%) were not on any ART at the time of delivery and 7 (0.2%) refused ART at the time of delivery.

Conclusion
HIV/AIDS remains a major public health problem in Namibia specifically in Zambezi region. HIV prevalence increased yearly among pregnant women who presented in Katima Mulilo maternity ward. We recommended age and location specific targeted interventions to reduce new infections among women.
Session D: Award-Eligible Presentations;
Moderators: Kashef Ijaz, Patrick O’Carroll; Thursday, 31 October 2019, 10:30am; Venue: Willow
Piloting a hospital-based road traffic injury surveillance system in Nairobi County, Kenya, 2018–2019

Dr. Valerian Mwenda, Dr. Elvis Oyugi, Ms. Merissa Yellman, Dr. Philip Maseghe, Dr. Gladwel Gathecha, Dr. Zeinab Gura

Background
The World Health Organization estimates that the road traffic injury (RTI) death rate in Kenya is 27.8/100,000 population (1.5x the global rate). In Kenya, the National Transport and Safety Authority (NTSA) collects RTI crash scene information; however, it lacks critical variables and excludes victims taken to hospitals. Therefore, we adopted WHO guidelines for RTI surveillance to pilot an RTI surveillance system in Nairobi County’s two public trauma hospitals.

Methods
A prospective study design was employed. All RTI cases presenting at Kenyatta National Hospital and Mama Lucy Kibaki Hospital from 10/2018–4/2019 were included. RTI cases were defined as injuries involving ≥1 moving vehicles on public roads. Demographic characteristics, injury circumstances, and outcome information were collected using standardized case report forms. The Kampala Trauma Score (KTS) was used to assess injury severity. Descriptive statistics (medians and proportions) were used to characterize RTI cases.

Results
Of the 1,840 RTI cases reported during the 7-month period from October 1, 2018 to April 30, 2019, median age was 29.8 years (range=1–89 years), and 73.2 % (n=1346) were male. Forty percent of cases (n=740) were taken to hospital by bystanders. Median time to hospital was 2.1 hours (range=0.1-21.2 hours). Pedestrians constituted 54.1% (n=995) of cases. Of the 400 motorcyclist cases, 48.0% lacked helmets (with 28.0% unknown). Similarly, 65.7% of bicyclist cases (23/35) lacked helmets (with 28.6% unknown). Among the 386 motor vehicle occupants, 59.6% were not using seatbelts (with 19.9% unknown). Seven percent of the cases (n=129) reported alcohol use (with 49.0% unknown) and 8.8% (n=161) reported mobile phone use (with 59.7% unknown) before the crash. Eleven percent (n=199) were severely injured (KTS <11), and 11.4% (n=210) succumbed to their injuries either on arrival or during treatment.

Conclusion
We demonstrated that a hospital-based RTI surveillance system in Nairobi County is feasible and data collected can guide prevention. Primary enforcement, instant fines and tackling corruption can improve compliance to traffic laws and road safety regulations. Integrating systems for collecting key information on risk factors and outcomes from both the police and emergency departments can provide continuous, reliable, and systematic information on key variables to all stakeholders.
Survival Status and Predictors of Mortality among Patients with Multi-Drug Resistant Tuberculosis Treated in Treatment Initiating Centers Ethiopia, 2018: A Retrospective Cohort Study

Mr. Getahun Kebede

Background
Multi-drug-resistant tuberculosis (MDR-TB) is an urgent global public health crisis. In 2017, there were an estimated 558,000 new cases of MDR-TB, which caused 230,000 deaths globally. Ethiopia is among the 30 high MDR-TB burden countries as well the prevalence of MDR-TB in Tigray is high. However, little is known about the survival and predictors of mortality among patients with MDR-TB in our study area. We estimated survival status and identified predictors for MDR-TB mortality and the findings can be used as an input to design effective interventions that might help to reduce morbidity and mortality in Tigray Region.

Methods
We conducted a retrospective cohort study in patients with MDR-TB enrolled for treatment in seven Treatment Initiation Centers (TICs) from February, 2013 to April, 2018. Data were collected consecutively by using pre-tested data abstraction forms. All relevant variables were extracted from patient registration log books and patient cards. Data were entered and analyzed using STATA version 12 and results were presented using tabular frequency and graphs. A cox proportional hazard regression model was built, the final result was interpreted using adjusted hazard ratio (AHR) with 95% CI and Statistical significance was declared at p-value <0.05.

Results
We enrolled 387 patients, followed for a total of 486.8 person-years. The median age at initiation of treatment was 30 years (IQR=24-40). More than half of the patients, 223(57.6%) were males. During five years follow-up period 47(12.1%) patients died, resulting in an incidence rate of 9.6 deaths per 100 person-years in the cohort. The mean survival time was 1.9 years, with overall survival rate of 86.2% at the end of two years. HIV-infection [AHR=2.3, 95%CI =1.1-4.7], presence of commodities [AHR =2.7, 95%CI =1.2-6.03], adverse drug events [AHR=2.6, 95%CI=.2-5.65], and sputum culture non-conversion [AHR=7.7, 95%CI =3.6-16.5] independently predicted mortality.

Conclusion
The survival time of MDR-TB patients was low and the overall incidence rate of death was high. In addition, HIV-co-infection, commodities other than HIV, drug adverse effects and lack of sputum culture conversion at two months were factors associated with mortality. Targeted interventions are needed to reduce deaths among those were MDR-TB patients.
Fatalities Associated with Road Traffic Accidents in Kaduna State – Nigeria, 2012-2018

Thursday, 31st October - 11:10: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 644

Dr. KWADE ASUNDUWA, Dr. Mabel Aworh, Dr. Visa I Tyakaray, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Background
Globally, road traffic accidents (RTAs) account for 20-50 million injuries annually with a loss of about 1.5 million lives. Developing countries including Nigeria account for over 85% of these fatalities. RTAs which are unintended and preventable remain a threat to public health. The increasing level of RTAs in Kaduna State and consequent injuries and deaths strengthened the case for its regular analysis. We analyzed surveillance data to describe the pattern of injuries among fatal and non-fatal victims of RTAs.

Methods
We conducted a retrospective review of Road Traffic Crash reports in Kaduna State from 2012-2018. Data on recorded cases of RTAs were extracted from the Federal Road Safety Commission records. We collected information on socio-demographics, RTA occurrence, morbidities, and mortalities. We analyzed data using descriptive statistics and trend analysis.

Results
Incidence of injuries was 82.73 per 100,000 populations and mortality was 17.45 per 100,000 populations. The proportion of injured among people involved in RTA was 6,827/13,353 (51.1%). Case fatality among injured individuals was 1,440/6,827 (21.1%) during the years under review. Mortalities among injured males and females were 20.9% and 21.6% respectively. The trend of death among injured cases of RTAs in Kaduna State was significantly on the increase ($X^2_{trend} = 13.6; P-Value = 0.00023$). Commercial and private vehicles accounted for 1,456/2,494 (58.4%) and 930/2,494 (37.3%) respectively. Human factors 1,738/2,662 (65.3%) were the leading cause of RTAs followed by mechanical factors 888/2,662 (33.4%).

Conclusion
RTAs remain a significant cause of death in Kaduna State requiring holistic attention and approach towards curbing its occurrence. There is a need to establish interventions to curb RTAs and reduce reckless driving. We recommend that public awareness campaigns on prevention strategies should be targeted at vulnerable road users and commercial vehicle owners who contributed to the highest burden of RTAs.
Vertical transmission of HIV in the era of universal antiretroviral therapy in Zvimba district, Zimbabwe 2016-2017

Dr. Tapiwa Dhliwayo, Dr. Blessing Mutede, Dr. Agnes Mahomva, Ms. Tsitsi Juru, Dr. Gerald Shambira, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Background
Despite implementing the elimination of mother to child transmission (eMTCT) of HIV strategies in Zimbabwe, MTCT (vertical transmission) of HIV remains a public health challenge in some parts of the country. Zvimba district recorded MTCT rate of 7%, above the national target of 5%. We determined factors associated with vertical transmission of HIV among HIV positive mother-baby pairs in Zvimba from 2016-2017

Methods
We conducted a 1:2 unmatched case-control study with a random sample of 51 cases and 102 controls. A case was a mother-baby pair whose mother was HIV infected during pregnancy or breastfeeding and baby tested HIV positive post-weaning. Controls were mother-baby pairs with HIV infected mothers during pregnancy or breastfeeding and HIV negative babies post-weaning. We collected data on demographics, maternal, child, and health system factors associated with HIV vertical transmission. We generated frequencies, proportions, means, odds ratio (OR) and their corresponding 95% confidence intervals (CI). Independent factors were determined by step-wise logistic regression analysis.

Results
Among the cases, 71% (36/51) were residing at commercial farms compared to 48% (49/102) of controls. In 55% (28/51) of cases, diagnosis of HIV was made during breastfeeding compared to 2% (2/102) in controls. Independent risk factors were: primiparous mother [aOR=1.9, 95%CI (1.41-8.20)] and defaulting Anti-Retroviral Therapy (ART) for ≥ 1 month during pregnancy [aOR=15.57, 95%CI (2.69-90.12)]. Independent protective factors were: knowledge of HIV status during pregnancy [aOR=0.17, 95%CI (0.04-0.82)], family support on ART [aOR=0.11, 95%CI (0.01-0.88)], attending ≥4 antenatal care visits [aOR=0.17, 95%CI (0.05-0.58)], and sexual partner on ART during pregnancy [aOR=0.34, 95%CI (0.18-0.87)].

Conclusion
Mothers who defaulted ART had a higher risk of transmitting HIV to their infants. Access to antenatal care and earlier awareness of HIV status reduced chances of vertical transmission. Primiparous women need special attention regarding eMTCT services and commercial farms must also be targeted.
Measles Outbreak at Religious Study Camp: Findings from Response Against Non-Vaccinated Population, Mie prefecture, Japan, 2019

Thursday, 31st October - 11:50: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 305

Dr. Asuka Takeda, Dr. Chiaki Kawakami, Dr. Hajime Kamiya, Mr. Yasuyuki Hara, Dr. Hajime Kusuhara, Ms. Miharu Nishioka, Mr. Takehiro Ogura, Dr. Yoshito Iwade, Ms. Yasuko Kanaya, Mr. Takahiro Shimoo, Dr. Tamano Matsui, Dr. Tomimasa Sunagawa, Dr. Motoi Suzuki

Background
In 2015, the World Health Organization verified Japan for measles elimination. Nevertheless, tourist and business travelers have continued to occasionally import measles virus, which has led to outbreaks. Unlike other developed countries, Japan has never reported many cases among vaccine refusers. At the end of 2018, an unvaccinated measles patient joined a religious study camp for teenagers in Mie prefecture. Measles reports associated with that patient increased rapidly, and Mie prefecture requested FETP to support the outbreak investigation.

Methods
Cases were defined as either laboratory-confirmed or clinically diagnosed measles patients reported to Mie prefecture with report dates 7 January—1 February, 2019. We included clinically diagnosed cases because some cases refused testing at medical facilities due to their beliefs. We calculated descriptive statistics for case data that were collected by local health centers (e.g., demographic information, vaccine history, contact investigation) and attack rates. Genotype analysis by RT-PCR at Mie institute of public health was performed when possible.

Results
A total 49 persons met the case definition, including 24 (49%) secondary cases associated with the camp. The median age was 17 years (IQR 14-22), and 55% were teens. Overall, 73% of cases and 83% of secondary cases were unvaccinated. Tertiary and quaternary case-patients were associated by family (36%), school (24%), and medical facilities (20%). The secondary attack rate at the religious camp was 71%. Among 42 cases with a specimen genotyped, all were D8.

Conclusion
This is the first measles outbreak response among a group of vaccine-refusers in Japan. Despite two-dose measles-containing vaccination coverage >95% in Mie prefecture, measles spread among the unvaccinated religious group with a high secondary attack rate. High vaccination coverage among contacts outside the religious group and quick response likely prevented the outbreak from spreading further or lasting longer. Therefore, we recommend achieving and maintaining high vaccination coverage nationwide to prevent secondary infections from non-vaccinated persons and the provision of more information on vaccines to vaccine refusers.
Measles Outbreak Investigation in Ginnir District of Bale Zone, Oromia Region, Southeast Ethiopia, May 2019

Thursday, 31st October - 12:10: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 395

Mr. Falaho Kalil, Mr. Desta Gemeda

Background
Measles is vaccine-preventable viral infection of humans, primarily affecting children <5 years. During early 2019, outbreak of measles occurred in Ginnir district of Bale zone, Southeast Ethiopia. We investigated to describe the outbreak and identify risk factors.

Methods
We conducted a descriptive and 1:2 unmatched case-control study in Ginnir district from March 18 to April 29, 2019. Fifty-six cases and 112 neighborhood controls were recruited. For descriptive study, we identified 1043 cases recorded on the line-list and for case-control study, cases were identified using active case search. Suspected measles cases were defined as any person with fever and maculopapular rash and cough, coryza or conjunctivitis. Confirmed case is a suspected case with positive IgM antibody. Mothers of case-patients and controls were interviewed using structured questionnaire. We estimated vaccination coverage (VC) and vaccine efficacy (VE) in children aged 9–59 months from case-control study. We conducted bivariate and multivariable logistic regression.

Results
In four-months period, a total of 1,043 suspected measles cases epidemiologically linked to five laboratory confirmed cases reported from Ginnir district. Of which, 555(53.2%) were males and 714 (68.5%) were <5 years. The median age of cases was 36 months (IQR=12-60 months). The overall attack rate (AR) was 63/10,000 population with case fatality ratio of 0.5% (5 deaths/1043). Children <1 year (182/1043) were the most affected age groups (AR=34.3/1000), of which 150(82.4%) were not vaccinated against measles, while 27 (18%) were eligible for vaccination (9-11 months). From the total measles cases, 824(79%) were not vaccinated against measles. Last-year (2017/18) administrative measles vaccine coverage of the district was 76.7%. The last four years (2015-2018) immunization coverage data suggests there is a pool of susceptible population. Being unvaccinated against measles (AOR=5.4, 95%CI=2.2-13.4), travel history (AOR=4.02, 95%CI=1.2-13.6), contact with measles case-patient (AOR=5.6, 95%CI=2.12-14.4) and mothers knowledge of measles transmission (AOR=0.36, 95%CI=0.15-0.87) were associated with measles infection. VE was 90% (95%CI: 69-97%). The estimated measles vaccination coverage was 65.7% (95%CI: 54.4–76.7%).

Conclusion
This confirmed measles outbreak was caused by failure to vaccinate, as indicated by the high VE, low administrative coverage, 79% unvaccinated cases and pool of susceptible population. Strengthening routine and supplementary immunization are required.
Outbreak Investigation of acute viral hepatitis E – Landikotal, Pakistan 2017

Thursday, 31st October - 12:30: Session D: Award-Eligible Presentations: The presentations in this session will be judged in consideration for an award. For more information, please see the Award Selection Procedures, available on the conference website. (Willow) - Oral - Abstract ID: 524

Dr. Izza Badar, Dr. Rizwan Ahmed, Dr. Tariq Ismail, Dr. Mirza Amir Baig

Background
On March 24, 2017, Landikotal Agency Hospital reported suspected cases of acute viral hepatitis. We conducted an outbreak investigation to assess the magnitude, evaluate risk factors, and recommend control measures.

Methods
Active case finding was done to identify the cases and a case control study was conducted. A case was defined as anorexia, nausea or vomiting, yellow discoloration of sclera and dark urine in a person residing in the camp colony, from February 10, 2017 to May 20, 2017. Age and gender matched controls were identified from the same area in a ratio of 1:2. Information regarding the source of drinking water was obtained. Frequencies were calculated, attack rates determined and odd ratios calculated at 95% CI and p-value <0.05. A total of 98 water samples including the four water sources were sent to a local lab for microbial analysis.

Results
A total of 52 cases (males=67%) were found with an attack rate (AR) of 3.4% and case fatality rate=3.8%. The mean age was 28 years (range 17-54). Most affected age group was 15 to 29 years (AR=8.7%). Hospital admission was required for 29% cases. Of the 52 cases, 23 reported drinking water from the Masjid tank (OR 4.4, 95% CI 2.0-9.4) and 11 from Dance Party (DP) tank (OR 3.2 95% CI 1.2-8.6). Eight reported drinking boiled water (OR 0.37 95% CI 0.16-0.88). Of the four water samples sent, two (Masjid and DP Tank) were found to be heavily contaminated with coliforms following heavy rains in hills.

Conclusion
The most probable cause of the outbreak was drinking water from Masjid and DP tanks. Heavy rains in the hills contaminated the springs supplying these tanks. Awareness on consuming boiled water was imparted to the residents. On our recommendation, a sand filter was installed and chlorination of water reservoirs was done.
Session A: Infections Transmitted through Food and Water; Moderators: Marina Kamaruddin, Martyn Kirk; Friday, 1 November 2019, 10:30am; Venue: Dogwood
An investigation on a food poisoning caused by Vibrio parahaemolyticus in a restaurant, in Sichuan Province, China, 2018

Mr. jie li, Ms. Runyou Liu, Mr. Xingyu Zhou

Background
Vibrio parahaemolyticus is widely found in seawater and seafood. It has spread to the inland areas in recent years and has been detected in salty foods with high salt content. It has become one of a major food safety risk factor in the inland areas of China. On August 19, 2018, a hospital reported multiple patients with abdominal pain, diarrhea, and vomiting. The patients had a meal at the H restaurant before the onset of illness, in Sichuan, China. We conducted this investigation to identify the cause, the mode of transmission and prevent similar outbreaks.

Methods
We defined a probable case as diarrhea (≥3 episodes/day) or vomiting Among the people who eat at the H restaurant on August 18, 2018, case searches were conducted by checking the outpatient logs of medical institutions in the region, interviewing restaurant practitioners, making phone calls or entering the home., analyze epidemic curves to find suspicious meals, conduct case-control studies and food hygiene surveys on suspicious meal foods, and collect case stools, anal swabs, and remaining foods for laboratory testing.

Results
A total of 61 cases were found, the attack rate was 8.03% (61/760), and the clinical manifestations were mainly diarrhea (100%), abdominal pain (96.7%), nausea (49.2%), and vomiting (41%); the point source exposure was shown in the prevalence curve, the average incubation period was 16h, and the case-control results showed that the pig head meat (OR=3.31, 95% CI=1.08-10.17) was suspicious food; the vibrio parahaemolyticus was detected in 2 cases’ stool samples, food semi-finished pig head meat and food made with pig’s head meat. PFGE results showed that the strains were homologous．

Conclusion
The food poisoning was caused by eating pork head contaminated by Vibrio parahaemolyticus. It is necessary to pay attention to the supervision of high-salt foods such as cured meat, and strengthen the monitoring and evaluation of the risk of Vibrio parahaemolyticus in such foods to prevent similar incidents.
An outbreak caused by the co-infection of Sapovirus and Norovirus at a university in Jiangxi Province, China, 2018

Friday, 1st November - 10:50: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 342

Ms. Xianxiang Ding, Mr. Guomin Zhang, Dr. Lijie Zhang

Background
65 students presented with diarrhea in a Jiangxi university were reported from Nov 25th to 28th, 2018. We conducted an investigation to determine the etiology, identify risk factors, and recommend preventive and control measures.

Methods
Suspected cases were defined as onset with diarrhea, or vomiting among students or staff at the university from Nov 15th - Dec 12th, 2018. Confirmed cases were students or staff with Sapovirus or Norovirus nucleic acid positive. We reviewed medical records, interviewed students and staff to search for cases. A case-control study was conducted to evaluate associated risk factors. Environmental investigation of food and water sources was conducted to identify possible sources of exposure. Samples from cases, water, utensils and canteen workers were taken for testing including Sapovirus and Norovirus by PCR testing.

Results
363 suspected and 20 confirmed case were identified, attack rate was 3.1% (375/12,000) for students, 3.2% (8/250) for canteen workers, no teacher cases. Student cases distributed in 12 departments of the university. Clinical features included diarrhea (88%), abdominal pain (77%), nausea (58%), vomiting (38%) and fever (14%). There were two canteens and their water were supplied by different reservoirs, all canteen worker cases worked in the first canteen. 83.9% (52/62) student cases ate at the first canteen compared with 75.4% (46/68) controls (OR = 2.5, 95% CI: 1.1-5.8). 13 water specimens and 20 stool specimens were positive. The reservoir which supplied the first canteen was contaminated with positive Sapovirus and Norovirus test. Sewage was beside the reservoir. Heavy rains right before outbreak may have played a role.

Conclusion
This outbreak was caused by the co-infection of Sapovirus and Norovirus. The source of infection was secondary to contaminated reservoirs. We recommend reconstructing the water reservoirs to assure no cross-contamination, and the water source should be strictly disinfected before supply.
Acute gastro-enteritis outbreak following intake of food offered to the deity in an urban locality, Coimbatore District, Tamil Nadu, India, 2018

Dr. S Abishek, Dr. Ponnaiah Manickam

Background
On 4 April, 2018, a cluster of gastro-enteritis was reported among devotees of religious festival held in a locality of Coimbatore District, South India. No outbreaks were reported from this locality during 2014-18. We identified potential sources for implementing control measures.

Methods
We defined case as occurrence of vomiting, abdominal cramps and loose watery stools among attendees within 24 hours of eating food items offered at the festival on 3 April, 2018. We searched cases door-to-door. We described cases by time (epicurve) and calculated attack rate. We did a retrospective cohort study of festival attendees. We compared food-specific attack rates and calculated relative risk (RR) and 95% Confidence Interval (CI). We tested blood and stool specimen for pathogens. We interviewed food handlers and did environmental investigations.

Results
Of 61 attendees, 52 had illness (Overall attack rate=85%; Male=75%, Female=96%). Following food distribution in the morning, cases started reporting from 4 pm and reached peak at 10 pm and the last case was reported on 4 April evening [Median time=12 hours]. Attendees reported diarrhea (96%), vomiting (85%) and abdominal cramps (77%). Incidence was higher among those who ate specific sweet (49 of 51) than who did not (3 of 10) [RR=3.2; 95% CI: 1.2 to 8.2]. This sweet was prepared by hand mixing of dried rice flakes, palm jaggery and ghee on previous night and was stored at room temperature. We did not identify pathogens in the blood but for E. coli in the stools. Food items were unavailable for testing. Ghee was adulterated with palmolein oil.

Conclusion
Symptoms and incubation period were suggestive of illness due to Bacillus cereus though not confirmed. The implicated sweet could have been contaminated potentially by food handlers, improper storage and or delayed preparation/serving. We recommended food safety and hygiene during preparation and shortening of time interval of serving.
Foodborne gastroenteritis outbreak among patrons of a local eatery, Fijai, Western Region, Ghana-2018

Ms. Vida Kwofie, Mr. Daniel Agudey, Ms. Irene Amedzro, Ms. Safiatu Tarl Abdullai, Mr. Charles Lwanga Noora, Ms. Joyce Bagina, Mr. Ebenezer Kofi Mensah, Dr. Ernest Kenu

Background
Foodborne diseases (FBD), a major global public health threat, though underreported are occasionally the cause of outbreaks in Ghana. On 29th June 2018, the Western Regional Health Directorate received report of suspected FBD outbreak in Fijai. Patrons of an eatery in Fijai reported to the community health centre with abdominal cramps, vomiting and diarrhoea. We investigated to characterize the outbreak and implement control and preventive measures.

Methods
We conducted a retrospective cohort study. We defined FBD case-patient as any person at Fijai who ate from the eatery from 26-30 June, 2018 and presented with abdominal cramps, vomiting or diarrhoea. We conducted active case-finding, interviewed patrons of the eatery and reviewed medical records of patients for data on demographics and clinical information. Descriptive data analysis and food specific attack rate ratios (ARR) and their corresponding 95% confidence intervals (CI) were computed. We inspected the food production facilities and cultured stool specimens from patients and food handlers.

Results
Of 45 case-patients, 68.8% (31/45) females were identified with overall attack rate of 48.9% (45/92) with no fatality. Sex specific attack rates were 65.5% (19/29) and 49.2% (31/63) for males and females respectively. Median age of case-patients was 22 years, (interquartile range [IQR]: 15.5-32 years). Patrons who ate vegetables were 4.6 times more likely to develop FBD (ARR=4.6; 95% CI= 1.90-11.09) compared to those who ate other food items. No leftover food was available for testing. Generally the food production site was untidy. *Vibrio parahaemolyticus* was isolated from stool specimen of 3 case-patients whose specimens were collected.

Conclusion
A point source FBD outbreak caused by *Vibrio parahaemolyticus* occurred among patrons of an eatery in Fijai. The most probable vehicle of transmission was contaminated vegetables. Prompt case management, community education and training of food handlers on food hygiene were control and preventive measures.
Norovirus GII.P16-GII.4 Sydney outbreak among wildfire evacuation shelter populations — Butte County, California, November 2018

Dr. Ellora Karmarkar, Dr. Seema Jain, Mr. Jeffrey Higa, Ms. Jazmin Fontenot, Ms. Regina Gallick Bertolucci, Ms. Thalia Huynh, Dr. Gwendolyn Hammer, Ms. Alice Brodkin, Ms. May Thao, Mr. Blake Brousseau, Ms. Danielle Hopkins, Ms. Emily Kelly, Ms. Madison Jablonski-Sheffield, Mr. Sandy Henley, Ms. Holly Whittaker, Mr. Chao-Yang Pan, Ms. Alice Chen, Dr. Janice Kim, Dr. Lori Schaumleffel, Dr. Erin Epson, Dr. Shua Chai, Dr. Debra Wadford, Dr. Duc Vugia, Dr. Linda Schultz-Lewis, DVM, MPVm

Background
On November 8, 2018, Camp Fire, California’s largest wildfire to date, displaced ~52,000 persons, with >1,100 evacuated to 9 shelters in Butte and surrounding counties. Before the fire, norovirus GII.P16 GII.4 Sydney was reported in the community. On November 10, 2 evacuees from 2 shelters experienced acute gastrointestinal illness (AGI). To identify AGI cases and prevent transmission, Butte County Public Health Department (BCPHD) initiated shelter surveillance and assessed on-site infection prevention and control (IPC), assisted by the California Department of Public Health.

Methods
On November 10, BCPHD distributed paper logs to shelter staff to enter information on persons with AGI (vomiting or diarrhea). When feasible, symptomatic persons submitted stool specimens. We defined confirmed cases as AGI among shelter staff/evacuees with a norovirus-positive stool specimen detected by real-time reverse-transcription polymerase chain reaction; norovirus-positive specimens were genotyped. Probable cases were AGI among staff/evacuees without associated specimens. We analyzed demographics, AGI trends, and assessed IPC.

Results
During November 10–December 1, 292 cases (16 confirmed, 276 probable) were identified among a fluctuating population of ~1100 people across 8 shelters (attack rate ~27%). Twenty-one of 292 cases (7%) sought hospital evaluation and 12 (4%) were staff. Of 255 patients with data, median age was 63 years (interquartile range 52-71). Sixteen (94%) of 17 available specimens were positive for norovirus GII.P16-GII.4 Sydney. The outbreak peaked on November 14 with 54 new cases. On-site assessment revealed deficiencies in surveillance, isolation, cleaning services, and handwashing. In response, we established illness screening at registration, isolation protocols, 24-hour on-site cleaning, and handwashing champions. By December 1, there were no incident cases.

Conclusion
Mass sheltering, limited surveillance, and suboptimal IPC likely facilitated norovirus transmission after Camp Fire. Disaster relief balances numerous competing urgencies; however, prioritizing effective shelter surveillance and IPC is necessary to proactively identify and contain outbreaks.
A water-borne outbreak of norovirus and multiple diarrheagenic Escherichia coli infections during Eid-Karasu, Turkey, August 2018

Friday, 1st November - 12:10: Session A: Infections Transmitted through Food and Water (Dogwood) - Oral - Abstract ID: 677

Dr. Zeynep Ozge OZGULER, Dr. Mehmet Akif SEZEROL, Dr. Serap CETIN COBAN, Dr. Fehminaz Temel

Background
On August 24, 2018, City Health Directorate reported more than a 10-fold increase in patients with diarrhea in emergency room of Karasu public hospital (the only health center available during Eid in this district). We investigated the cause of the outbreak and implemented control measures.

Methods
A suspected case was a Karasu district resident diagnosed with gastroenteritis-related ICD-10 codes (R11, K52) among outpatients during 20-27 August. A probable case was a suspected case with diarrhea and vomiting. We conducted a case-control investigation, among 175 randomly selected probable cases and their neighbor controls through face-to-face interview. Exposure was characterized by hygiene habits, consumption of tap, fountain and bottled water. We compared exposures of probable cases with neighbor controls (175:175) to calculate odds ratios (ORs) and 95% confidence intervals (CIs). We collected six clinical specimens and 19 water samples. Pathogens were identified using culture methods and PCR.

Results
Attack rate of suspected cases, widespread in the district, was 2.9% (1815/62866). The number of cases peaked on 22 August and the epidemic curve revealed a point-source outbreak. Of probable cases, 74.3% (130/175) drank tap water, compared with 62.3% (109/175) of controls (OR=1.8, 95%CI=1.1-2.8). Shiga-toxin producing Escherichia coli, enteropathogenic E. coli, and enteroaggregative E. coli and norovirus were isolated from human specimens. Thirteen water samples (including the one from the main water tank supplying the whole district) tested positive (>1CFU/100ml) for total Coliform (1-920 CFU/100ml) and/or Escherichia coli (1-720 CFU/100ml). Free chlorine levels were below 0.2 ppm in seven samples. Main water storage tank and pipes were in bad condition.

Conclusion
Epidemiological and environmental investigations pointed towards contamination of water distribution system with fecal pathogens. Upon decision in a multi-stakeholder meeting, water tank was hyperchlorinated and chlorination devices were implemented, renewal of water distribution system was decided. We conducted health education on hygiene practices and safe water consumption. Number of cases decreased following the interventions.
Session B: Vaccine-preventable Diseases; Moderators: Sara Lowther, Oyeladun Okunromade; Friday, 1 November 2019, 10:30am; Venue: Cherry
Epidemiology of Rubella in Nigeria, 2013-2017

Dr. Aisha Sadauki, Dr. Oyeladun Okunromade, Dr. Arhyel Malgwi, Dr. Mahmood Dalhat, Dr. Hyelshilni Waziri, Dr. Muhammad Shakir Balogun, Dr. Chikwe Ihekweazu

Background
Rubella is a mild illness in children but may result in congenital rubella syndrome (CRS) when it affects pregnant women. Nigeria tests for rubella as part of measles case-based surveillance but is yet to commence CRS surveillance or introduce a rubella vaccine into the national immunization programme. We described the epidemiology of rubella cases from measles case-based surveillance data and analysed risk factors for rubella IgM positivity.

Methods
We extracted data of all rubella positive cases from 2013 to 2017 from the national routine measles case-based surveillance system. The database includes patients with suspected measles, according to the WHO clinical case definition. Based on an algorithm, samples are tested for measles IgM; samples that test negative or indeterminate for measles IgM are tested for rubella-specific IgM. We described the data and calculated odds ratios (OR) with 95% confidence intervals (CI) to determine factors associated with rubella IgM positivity.

Results
Of the 17,549 measles IgM-negative samples tested, 1,548 (8.8%) tested positive for rubella IgM. The median age of the rubella positive patients was 4 years (range: 1 month to 60 years). Sixty (3.9%) of the rubella-positive cases were women of child-bearing age (WCBA). Cases occurred predominantly during the dry season with 915 (60%) occurring between December and March. Patients >5 years of age (OR= 1.6; 95% CI: 1.4-1.7), those from the southern region of the country (OR= 1.7; 95% CI: 1.5-2.0) and those who had received two or more doses of measles vaccines (OR= 1.3; 95% CI: 1.2-1.5) were more likely to test positive for rubella. There was no relationship between settlement type (urban /rural) (OR=1.1; 95% CI: 1.0-1.2) and sex (OR= 1.0; 95% CI: 0.9-1.1) and rubella positivity.

Conclusion
The on-going rubella transmission in Nigeria affecting WCBA portends a high risk of CRS. We have finalized plans to establish surveillance for CRS. We recommend introduction of a rubella containing vaccine into the national immunisation schedule.
Investigation and control of Measles Outbreak in Dehdadi district, Balkh Province, Afghanistan, 2017

Friday, 1st November - 10:50: Session B: Vaccine-preventable Diseases (Cherry) - Oral - Abstract ID: 320

Dr. Aminullah Shirpoor

Background
Measles is a most contagious infection known to humans and ranks among the top four childhood killers worldwide. Despite immunization progression, unfortunately Afghanistan is still an endemic country for measles outbreaks. Over 20 of the 34 provinces in Afghanistan, of the 25,000 reported cases in 2017, 1235 cases reported by Balkh province

Methods
On December 2016 the index suspected measles case reported by surveillance focal point from an internally displaced people (IDP) encampment in Dehdadi District. Outbreak investigation conducted, a measles case defined as any person with fever, maculopapular rash, conjunctivitis and cough or coryza in the Dehdadi district since 3rd Dec 2016. Rapid assessment conducted in the area for vaccine coverage and active case finding. Blood serum specimen collected and shipped to Central Public Health Laboratory in Kabul and confirmed by ELISA-IgM test.

Results
Of the 546155 population 359 suspected measles cases identified attack rate AR = 6.6/10000 and male to female ratio 1.3:1. Of the173 cases tested for measles IgM, 131(75.7%) (95% CI 68.6, 81.9) confirmed. There were 17 deaths that indicated the case fatality rate (CFR) (4.7%) (95% CI 2.5, 6.9). The mean age of cases was 30.6 months and ranged 1 month -29 years. One dose of vaccination coverage among the IDP population was 18%, while only 6 (1.67%) of all cases had received one dose of measles vaccine. We conducted two rounds of village-wide immunization campaigns and vaccinated 61084 children, subsequently, cases ceased.

Conclusion
To eradicate measles, high vaccination coverage must be maintained, and this must be the focus of local and national authorities. Low vaccination coverage looks likely caused the outbreak. The high contagiousness of measles requires initial widespread supplemental vaccination to stop a large epidemic; small efforts will not be successful.
An Internet-Based Survey of Influenza Vaccination Uptake among Health-Care Workers – China, 2018-2019 Season

Friday, 1st November - 11:10: Session B: Vaccine-preventable Diseases (Cherry) - Oral - Abstract ID: 347

Mr. yayun tan, Dr. Luzhao Feng, Dr. Ying Qin, Ms. ZHIBIN Peng, Dr. Jiandong Zheng, Mr. Tiantian Li, Mr. Wei Zhang, Ms. Jing Zhang, Ms. Qian Xu, Mr. Zhiqiang Guo, Ms. Junhua Yao, Ms. Fen Pang, Ms. Teng Ma, Ms. Wenjing Duan, Dr. Yali Zhang

Background
The influenza vaccine coverage rate (VCR) among Chinese health-care workers (HCWs) is low (<15%). To increase VCR, the Chinese National Health Commission has required all hospitals to provide free influenza vaccination for HCWs since October 2018. However, this policy hasn’t been fully implemented. This study aims to investigate the current influenza VCR and its associated factors among HCWs.

Methods
During March - April 2019, we conducted an internet-based survey randomly selecting respondents from Dingxiangyuan, the biggest online forum for HCWs. Information of demographics, occupation, hospital policy on influenza vaccination, influenza vaccination status during the 2018-2019 season, and reasons for vaccine refusal were collected.

Results
Among 135,438 HCWs sampled, 4,078 HCWs (3316 physicians, 540 nurses, 178 laboratory technicians/pharmacists, and 44 administrative/support staff) from 31 provinces completed the questionnaire. The overall self-reported VCR in HCWs was 12%, whereas in those in primary level hospitals were 15% and other level hospitals 11% ($\chi^2=7.55$, $P<0.01$). Only 19% HCWs replied that the hospital they worked in had a free vaccination policy. HCWs in hospitals with a free vaccination policy had a significant higher VCR (32%) than those at hospitals without a free vaccination policy (6.7%) ($\chi^2=400.94$, $P<0.01$). The VCR was 38% among those who were required by hospitals to receive, 17% not required but encouraged by hospital, and 6.1% neither required nor encouraged ($\chi^2=254.32$, $P<0.01$). Reasons for not being vaccinated ($n=3,606$) included: being too busy (51%), thinking influenza is a mild disease (35%), unavailable free vaccination (24%), and not knowing the location of vaccination sites (22%).

Conclusion
The current influenza VCR remains very low among HCWs in China. Compliance in hospitals with the policy of providing free influenza vaccination for HCWs should be improved. Providing in-hospital vaccination sites to increase the accessibility of influenza vaccination service, improving communication of risks and benefits of influenza vaccination, and requiring or encouraging HCWs to receive vaccination are recommended.
Measles outbreak investigation and public health response in Kasserine district. Tunisia, 2019

Dr. Mhamdi Dalel, Dr. Moncef Mhamdi, Dr. Hajer Letaief, Prof. Nissaf Ben Alaya

Background
Measles is a mandatory notifiable disease in Tunisia. In Kasserine district (Central west Tunisia), the annual incidence of measles is 1 to 2 cases per year and the overall vaccination coverage is 90%. A measles outbreak occurred on January 2019 in Kasserine. We describe the local outbreak investigation and public health response.

Methods
An intensive door-to-door active search was carried out to identify measles cases. Any person with generalized maculopapular rash and fever was defined as suspected case. A suspected case with positive laboratory results was considered laboratory confirmed. Information on personal details, residence, time of onset and immunization status were obtained. Measles immunization catch-up campaign and mass vaccination campaigns targeting 6-11 months; health care professionals and contacts were initiated.

Results
From January 2019 to May 2019, 1532 cases and 21 deaths were reported in Kasserine. The attack rate was 0.3%. The highest attack rate was among infants <1 year (4.2%). The median was 8 years old and the sex ratio was 1.05. The vaccination status was documented for 995 cases: 645 (54%) cases were not vaccinated against measles and 350 (27%) had at least one dose of measles vaccine before the outbreak. The measles immunization catch-up campaign involved 922 children. The 6-11 months vaccination campaign involved 6198 infants. In total, 1798 contacts and 57 health professionals were vaccinated. Mass health education campaign promoting measles vaccination was conducted in all health care facilities and through Facebook and local radio stations.

Conclusion
This outbreak occurred due to a large number of none or incompletely vaccinated children. Investigation provided an opportunity to identify high-risk groups and weaknesses in the routine immunization. Strengthening of routine immunization, surveillance, early response actions are strongly recommended.
Japanese Encephalitis vaccination coverage and its associated factors in Phu Thien district, Gia Lai province, Vietnam, 2018

Mr. Thang Hoang Nghia, Dr. Duoc Pham Tho, Mrs. Thao Phan Thi Thanh Thao, Ms. Quyen Phan Thi Le, Ms. Oanh Tran Thi Hoang

Background
In 2017, Japanese Encephalitis (JE) infections contributed to 24% (29/119) of total Encephalitis patients in the Central Highland of Vietnam. Among those, Phu Thien district had most JE patient in Gia Lai province (seven of 22 patients), who were ethnic minorities residing in five communes. Knowing the vaccination coverage is important to control and eliminate JE (vaccine-preventable disease) in the district. This study aimed to identify the vaccination coverage for JE in the district and its associated factors.

Methods
We performed a cross sectional study from April to August 2018 in Phu Thien district. Using multistage cluster sampling, we randomly selected 280 households with children aged 1-15 from each of five communes that reported JE cases in 2017. We used pre-designed questionnaire to collect information on demographic and vaccination-related factors. Child vaccination history was verified through reviewing vaccination cards or medical records at commune health station (CHS). We used STATA 14.0 with descriptive analysis to define the JE vaccination coverage, and multivariate analysis to identify its associating factors.

Results
Of 282 children under the study, 154 (54.6%) children received three JE basic doses. Only 36.8% (85/231) of parents correctly answered all questions about JE vaccination. Most of parents received JE vaccination information from commune health workers (139, or 63.47%). Factors influencing vaccination coverage included going to kindergarten (OR= 4.08; 95%CI: 1.77 – 9.42), parents over aged 30 (OR=3.6; 95%CI: 1.32 – 9.79), living less than 1km from CHS (OR=7.16; 95%CI: 0.99 – 51.68), JE vaccination knowledge (OR=2.49; 95%CI: 1.38 - 4.47), and source of JE vaccination information received from commune healthcare workers (OR=2.75; 95%CI: 0.16 - 6.53).

Conclusion
Low JE vaccination coverage in Phu Thien district should be improved through various interventions. These include enhancing parents’ awareness via direct communication by commune health workers, especially for households located over 1km from CHS, young parent, and children do not go to kindergarten.
Maternal Knowledge and Infant Uptake of Valid Hepatitis B Birth Dose at Routine Immunization Clinics in Enugu State - Nigeria, 2018

Dr. Uchechukwu Okenwa, Prof. Magbagbeola D Dairo, Dr. Eniola Bamgboye, Dr. Olufemi Ajumobi, Dr. Muhammad Shakir Balogun, Dr. Patrick Nguku

Background
The prevalence of Hepatitis B virus infection (HBV) is 13.7% and approximately 19 million Nigerians are chronically infected. The risk of developing chronic HBV is greatest (90%) in infected infants. World Health Organization recommends Hepatitis B birth dose for all infants within 24 hours of birth as the most cost-effective measure to prevent perinatal HBV. We assessed and identified the predictors of maternal knowledge and infants' uptake of valid Hepatitis B birth dose (HepB-BD).

Methods
We conducted a hospital-based cross-sectional survey among 344 mother-infant attendees of routine immunization clinics selected by multi-stage sampling technique in Enugu State, Nigeria. We collected data on socio-demographic characteristics, delivery history, maternal knowledge and infant's receipt of valid HepB-BD with interviewer-administered questionnaire. Maternal knowledge was assessed using nine domain questions. Overall, good knowledge was defined as a score of >50%. Only infants who received first Hepatitis B dose within 24 hours were considered to have received valid BD. We calculated frequencies, performed Chi square test and logistic regression.

Results
One hundred and two (29.7%) mothers knew HBV can be transmitted from mother to child; 119 (34.6%) and 156 (45.3%) knew their infant should receive valid HepB-BD and four doses for full immunization of HepB respectively. Overall, 114 (31.1%) mothers had good knowledge of HBV and 88 (26.9%) of 327 (95.1%) who delivered at the health facilities had valid HepB-BD. Predictors of maternal knowledge were tertiary education (adjusted Odds Ratio (aOR): 2.1, 95%CI: 1.3-3.5) and living in rural areas (aOR: 0.5, 95%CI: 0.3-0.9). Predictors of valid HepB-BD uptake were maternal knowledge (aOR: 2.4, 95%CI: 1.4-4.0) and delivery at health facilities offering immunization services (aOR: 5.4, 95%CI: 2.5-11.9).

Conclusion
Knowledge and uptake of valid HepB-BD were low. Health education on benefits of valid HepB-BD was given to mothers after administration of questionnaires. We disseminated findings to the State health ministry and recommended administration of HepB-BD at place of delivery to improve its uptake.
Session C: Occupational and Environmental Health; Moderators: Carmen Sanchez Vargas, Thomas Waite; Friday, 1 November 2019, 10:30am; Venue: Poplar
Determining the utility of national real-time ambulance syndromic surveillance to identify and monitor the adverse health impact of extreme weather events and seasonal respiratory infections in England

Friday, 1st November - 10:30: Session C: Occupational and Environmental Health (Poplar) - Oral - Abstract ID: 143

Mr. Simon Packer, Mr. Paul Loveridge, Ms. Ana Soriano, Dr. Roger Morbey, Dr. Dan Todkill, Mr. Ross Thompson, Ms. Tracy Rayment-Bishop, Dr. Richard Pebody, Ms. Cathryn James, Ms. Hilary Pillin, Dr. Alex Elliot, Prof. Gillian Smith

Background
Severe respiratory infections (SRI) and extreme weather events are significant global health threats. The National Ambulance Surveillance System (NASS), established in England in 2018 is one of the first syndromic surveillance systems with full coverage of ambulance dispatch data. NASS collects data on 18 syndromes through the submission of daily line lists with chief presenting complaint (CPC) codes generated during an ambulance call. We aimed to determine the utility of NASS to monitor extreme temperature events and SRI for public health action.

Methods
Daily total calls were calculated between 01/Apr/2016 and 27/Mar/2019. Median daily “Heat/Cold” CPC calls were compared to known temperature events (KTE) [significant events occurring in 2018 identified a priori] and “Breathing Problems” CPC calls were compared to periods above national thresholds for antiviral prescription (influenza season).

Wilcoxon signed-rank test compared median calls between extreme temperature days (ETD) [within 5th or 95th Central England Temperature percentiles]/influenza season days and non-ETD/non-influenza season days.

Results
During the study period, 12,585,084 calls were recorded. In 2018, median daily “Heat/Cold” calls were higher during KTE: heatwave (16/day, 736 total) and extreme cold weather events (28/day, 339 total) compared to all other days in 2018 (6/day, 1,672 total). Median daily “Heat/Cold” calls on ETD days (15/day) were significantly higher than non-ETD days (5/day, p<0.001). “Breathing Problems” calls peaked at the start of all influenza seasons. Median daily “Breathing Problems” calls were significantly higher during influenza season (1,652/day) compared to non-season days (1,546/day, p<0.001).

Conclusion
NASS data can be used to identify adverse health impacts and inform public health action during extreme temperature and influenza events. NASS is a low resource, rapid and flexible surveillance option providing real-time data on a range of indicators. We recommend other countries consider the use of ambulance data for the surveillance of pandemic influenza, emerging SRI and extreme temperature events.

Friday, 1st November - 10:50: Session C: Occupational and Environmental Health (Poplar) - Oral - Abstract ID: 577

Dr. Tamuno-Wari Numbere, Dr. Ikeola Adeoye, Prof. Olufunmilayo Fawole, Dr. O Morakinyo, Dr. Mabel Aworh, Dr. Adedoyin A Fetuga, Dr. Ibitein Okeafor, Dr. Muhammad Shakir Balogun

Background
Air pollution is directly linked to respiratory diseases that account for almost 10% of child deaths, making air pollution one of the leading dangers to children’s health. There has been a rise in atmospheric pollution in Rivers State within the past few years, and the current prevalence of asthma in children in Rivers State is unknown. We therefore investigated to determine the prevalence of asthma associated with atmospheric particulate matter among children in Rivers State.

Methods
We conducted this comparative cross-sectional study among children 5-14 years living in oil-producing (OP) and non-oil producing (NOP) areas in Rivers State. We selected 440 children (220 per group) using a three-stage sampling technique. We collected data on socio-demographic characteristics and risk factors for asthma using the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire. We performed descriptive statistics, identified risk factors by calculating adjusted odds ratio (AOR) and 95% confidence intervals (CI) using unconditional logistic regression.

Results
Mean age of children was 9.2 ± 2.7 years in OP area and 9.2 ± 2.9 years in NOP area. Most 116 (52.7%) in OP and 121 (55.0%) in NOP areas were males. Prevalence of asthma was 35.9% (95% CI: 35.5-36.3) in OP area and 6.4% (95% CI: 6.1-28.2) in NOP area. Family history of asthma (OR=8.1; 95% CI: 3.9-17.0) and presence of a smoker in the house (OR=7.3; 95% CI: 2.4-22.3) were associated with asthma. Controlling for age, family history (AOR= 7.0; 95% CI: 3.5-13.8) and living in an OP area (AOR: 4.7; 95% CI: 2.3-9.7) were risk factors for asthma.

Conclusion
This study demonstrated a high prevalence of asthma among children living in OP areas. Risk factors identified were family history of asthma and place of residence. We counseled caregivers on measures to reduce exposure to air pollutants. We recommended that the State Ministry of Health should strengthen surveillance for asthma within the communities. We also recommended to the Ministry of Environment to ensure compliance with the existing laws on air pollution and improve monitoring and regulatory control of the oil industry.
Necrotizing fasciitis (NF), agriculture business and factors associated with NF-related disability and mortality, Thailand, 2014 - 2018

Dr. Panupong Tantirat, Dr. Thanit Rattanathumsakul, Dr. Hirunwut Praekunatham

Background
Necrotizing fasciitis (NF), a rare skin and soft tissue bacterial infection, can cause severe complications, including amputation and death. In Thailand, the nationwide situation of NF has never been investigated. The objectives of this study are to describe demographic characteristics and spatiotemporal pattern of NF and to determine factors influencing disability and mortality.

Methods
Cross-sectional study using secondary data was conducted. All patients diagnosed as NF were extracted from Thailand's national health databases. Variables selected for descriptive study include demographic, geographic and disease characteristics. Spatial distribution was tested using Moran's I statistic. Cyclic, trend and seasonality were assessed using Buy-ballet table with model fitting. Multivariable analysis using binomial logistic regression was performed to determine factors associated with disability or mortality.

Results
During 2014-2018, of 90,683 NF cases, 4.9% died. Median age is 59.4 years old (Q1-Q3 48.8 – 69.3). Annual incidence proportions show an upward trend, ranging from 26.1-32.6 per 100,000 population; while, monthly incidence proportions are highest between May and August, which is crop planting season. As indicating by local Moran's I, high incidence areas are clustered in northeastern Thailand, where most local people work in agricultural sector. Most of the patients developed NF at ankle and foot (43.2%) followed by lower leg (26.7%). The amputation rate among the NF cases was 8.0%. As analyzed using multivariable analysis, the significant risk factor for amputation are found in patients with underlying diabetes (OR 7.94, 95%CI 7.34-8.61). Risk factors for mortality include being elderly (OR 1.82, 95%CI 1.68-1.98), hypertension (OR 1.16, 95%CI 1.07-1.27), cirrhosis (OR 4.67, 95%CI 4.17-5.21), and malignancy (OR 1.88, 95%CI 1.55-2.26).

Conclusion
NF causes significant morbidity and mortality in Thailand. Occurrence of NF is highly seasonal. Health workers in the rural northeast should be trained in early diagnosis and aggressive treatment for NF, especially among the elderly and patients with diabetes, hypertension, cirrhosis and malignancy.
Effectiveness of Quality Improvement on Occurrence of Needle Stick Injuries in Harare City, Zimbabwe, 2017: A Quasi-experimental Study

Friday, 1st November - 11:30: Session C: Occupational and Environmental Health (Poplar) - Oral - Abstract ID: 140

Ms. Zvanaka Sithole, Dr. Prosper Chonzi, Dr. Gerald Shambira, Ms. Tsitsi Juru, Dr. Notion Gombe, Mr. Simbarashe Chiwanda, Prof. Mufuta Tshimanga

Background
Globally, healthcare workers (HCWs) incur an estimated two million needle stick injuries (NSIs) per year and 90% of these injuries occur in Africa. In Zimbabwe, neither the prevalence nor the factors associated with HCW-acquired NSI are known. Harare city recorded an increase in NSIs among nurses from 1% (n=5) in 2013 to 7% (n=30) in 2016, highest being from the Southern District. We designed and evaluated the effectiveness of a quality improvement (QI) approach towards reduction of NSI incidence.

Methods
We conducted a quasi-experimental study among 83 purposively selected nurses in southern District. We designed and implemented an intervention package comprising training, deployment of social behavioral change materials and workflow re-organization. We measured effectiveness of the intervention using Plan, Do Check Act cycle. Data on intervention effectiveness was collected pre and six months post-implementation using structured questionnaires. Analysis was presented using frequencies, means, and proportions.

Results
Lack of knowledge 99% (82/83), unorganized activities 60% (50/83) and limited space in the treatment rooms 59% (49/83), were the major reasons for NSI before intervention. Pre-intervention, 10% (8/83) of the nurses had good knowledge level while 96% (80/83) had good knowledge level post-intervention. The NSI incidence rates pre-intervention was 0.97 NSI/month and 0.17 NSI/month post-intervention, a decline rate of 82% (p< 0.01). Total cost saved by the intervention was USD5 777.00.

Conclusion
Lack of knowledge on occurrence of NSI, unorganized activities, and limited working space in the treatment rooms were the major reasons for NSIs before the intervention. The QI intervention was effective in reducing incidence of NSI. We recommended HCW trainings on NSI, promotion of socio-behavioral change and workflow re-organization in order to offset economic efforts directed at managing NSIs.
Urogenital schistosomiasis outbreak in a Basic School, Ketu North District, Volta Region, Ghana-2018

Dr. Paul Dsane-Aidoo, Ms. Magdalene Akos Odikro, Mr. Holy Alomatu, Dr. Donne Ameme, Mr. Desmond Ametepi, Dr. Priscillia Nortey, Dr. Ernest Kenu, Prof. Edwin Afari

Background
Schistosomiasis, a neglected parasitic infection caused by trematode worms affects approximately 220 million people globally. Its prevalence ranges from 10-50% in the Volta Region of Ghana, mostly affecting basic school children. On November 28 2018, the Disease Surveillance Department received reports of increase in suspected Schistosomiasis among pupils of a basic school in the Volta Region. On November 29 2018, a field epidemiology team was sent to determine the magnitude, risk factors and to implement control measures.

Methods
We conducted sex and age-matched case control study. A case of Schistosomiasis was any pupil of the school with blood-stained urine with laboratory confirmed microscopic Schistosoma egg in terminal urine samples, from September to November 2018. We identified cases from the school and from hospital records. We selected two appropriate controls per case-patient from the school. Socio-demographic and exposure data were collected with a structured questionnaire. We assessed the banks of the water bodies for snails. Descriptive analysis and conditional logistic regression were performed to calculate matched odds ratio (mORs) with 95% confidence intervals (CI).

Results
Of 880 pupils, 112 case-patients were identified (attack rate = 12.7%) with 72 (64%) being males. Median age of cases was 15 years (Interquartile range [IQR] = 5-18). Sixty-three (44.4%) of pupils versus 73 (78.5%) of controls reportedly swam in a dam (mOR = 6.59, 95% CI = 3.03-14.3). Of the two dams in the community; unlike swimming in dam B (mOR =1.1, 95% CI = 0.3-4.3), swimming in dam A (mOR=5.9, 95% CI = 2.03-17.6) was a risk factor for Schistosomiasis. No snails were observed at the banks of both dams.

Conclusion
Swimming in dam A was the main risk factor for the Schistosomiasis outbreak. Health education and mass drug administration of Praziquantel were control measures for the school and the entire community.
Evaluation through outbreak simulation exercise points to need for considerable improvement in the capacity of peripheral health workers for outbreak detection and response, South India, 2018

Friday, 1st November - 12:10: Session C: Occupational and Environmental Health (Poplar) - Oral - Abstract ID: 242

Dr. Karishma Kurup, Dr. Ponnaiah Manickam, Dr. M Prakash, Dr. G Velmurugan

Background
Outbreaks are emergencies, requiring skilled peripheral health workers in the health system. Performance during outbreaks bring out skills of health workforce at different levels of the health system. In view of the lack of evaluations of knowledge and practices of peripheral health workers regarding outbreak investigation and response, we conducted a survey to estimate the performance level of health workers in outbreak detection and response.

Methods
Using inputs from the manual of India’s Integrated Disease Surveillance Programme (2015) for health workers and following expert discussions, we developed a simulation exercise based on hepatitis and fever outbreak to ascertain knowledge and skills in outbreak detection and response. Following pilot-test, we finalised the instrument in the local language. In an outbreak investigation, health sector plays the first role in detection and response. Hence the simulation exercise was self-administered among all health inspectors (n=39) responsible for outbreak investigation working in a district in South India. We collected socio-demographic factors, training, education level, awareness about the surveillance program, outbreak triggers and prior experience with an outbreak. We assigned 0.25 score for each correct response (Range: 0 to 10.75). We categorised score of < 75% as poor performance. Academic ethics committee of ICMR-National Institute of Epidemiology approved the protocol.

Results
All the health inspectors were male except one. Median age was 51 years [Interquartile range (IQR) 37.5-54). Median years of service was 12 (IQR 5.3-23), 22 received training and 15 had prior exposure to an outbreak in the previous year. Overall performance of health staff was poor with the highest mark being below 40%. Median score in section of history taking was 0.25 [IQR: 0-0.5], 31% (n=12) scored zero. The median score in the section of data entry, analysis and outbreak detection was 0.25 (IQR 0-0.25), 28% (n=11) scored zero. Median score in section of outbreak response was 0.75 (IQR 0.75-1.13), 5% (n=2) scored zero.

Conclusion
Peripheral health workers performed poorly in a simulation exercise on outbreak preparedness and response. Currently, practices of outbreak investigation are taught through traditional methods. We recommend practical field-epidemiology training with periodic field/facility-based evaluations to improve their performance.
Session D: Maternal and Child Health; Moderators: Latifat Ibisomi, Brian McCarthy; Friday, 1 November 2019, 10:30am; Venue: Willow
Epidemio-clinical profile of childhood cancers in Yaounde at the Mother and Child Center, 2016-2017

Background
Incidence of childhood cancers ranges from 50 to 200 per million children worldwide and mortality remains high in developing countries. In Cameroon, few data are available, with 62 round cell tumors recorded in children in Yaoundé between 2004 and 2007. We described the epidemiological profile of childhood cancers in the national reference center in Yaoundé.

Methods
We conducted a retrospective study from 2016 to 2017 in the Mother and Child Center. We collected data from registry and medical records of the pediatric oncology unit. We listed socio-demographic features, clinical stage, average consultation time (from symptoms onset to specialized consultation) and treatment features. We used Fischer Exact test with statistical significance of $p<0.05$.

Results
We recorded 266 children (average of 11 new cases per month). The M/F sex ratio was 1.44, with males being mostly affected [59% (157/266); $p=0.0004$]. Mean age was 6.9 years ($\pm 4.6$ years). About 63.5% (127/200) reside outside Yaoundé. These children came from a household with a median number of 4 children (1-15) with 35% (34/95) had an unemployed or unknown/deceased father. Diagnosis was confirmed among 75.2% (200/266) children. A hematologic malignancy was found in 65.4% (174/266). Initial clinical signs were reported among 47.7% (127/266): tumor syndrome 50.4% (64/127), intermittent fever 49.6% (63/127) and digestive signs 44.8% (57/127). The most common cancers were acute lymphocytic leukemia, 18.5% (48/259), and Burkitt's lymphoma, 16.9% (44/259). Clinical stage was reported among 49.8% (129/259) of children: 49.6% (64/129) at stage III and 20.9% (27/129) at stage IV. The median consultation time was 1.7 months (IQR: 0.9-3.9 months) and median confirmation time was 6 days (IQR: 0-13 days). Of the 266 children registered, only 2 were relapsed. Anti-carcinogenic treatment was initiated in 71.8% (179/249) of children and chemotherapy done in 94.9% (170/179). The CFR was 45.1% (120/266) with 118 children whose evolution is unknown; and 50% (57/114) of deaths occurred in the first month after consultation.

Conclusion
Most of childhood cancers were referred from outside Yaoundé and were diagnosed at advanced clinical stages with long delay of specialized consultation. Further study are needed to quantify the national burden of pediatric cancers and address improving early diagnosis and providing proven treatments.
Factors associated with neonatal deaths among neonates admitted to the David Bernardino Pediatric Hospital, 2017-2018, Luanda, Angola

Dr. Dora Victorino, Dr. Joaquim Dias, Dr. Balbina Felix, Dr. João Pires

Background
In 2016, WHO estimated that 2.6 million deaths, or roughly 46% of all under-five deaths, occurred during the neonatal period. UNICEF estimates that 29 neonates die in every 1,000 live births in Angola. We aimed to evaluate the risk factors for neonatal deaths at a tertiary and reference Pediatrics Hospital - David Berbardino Pediatric Hospital (DBPH) - in Luanda, Angola.

Methods
A 1:2 case-control study was conducted between July 2017 and July 2018, among 587 newborns (196 cases – neonatal deaths and 391 controls – neonatal survivals) who were admitted at DBPH. Semi-structured questionnaires were used for primary data, whereas secondary data was obtained through the review of clinical files. Significance level was set at p<0.05 for all hypothesis tests. Contingency tables with Pearson chi-squared (χ2) tests and pairwise correlations were used to identify factors associated with neonatal deaths. Multivariable logistic regression modeling was used to identify independent factors associated with neonatal deaths and respective adjusted OR.

Results
The risk factors for neonatal death were: interval between the present and previous child less than 2 years (OR = 5.2, 95% CI 3.2 - 8.5, p <0.001), mother’s alcoholism (OR = 3.9, 95% CI 12.4 - 6.5, p <0.001); having less than 4 prenatal consultations (OR = 2.4, 95% CI 1.6-3.6, p = 0.001); very preterm baby - born prior to 32 weeks gestation - (OR = 6.9, 95% CI 4.3-11.3, p <0.001); baby born with gastroschisis (OR = 18.9, 95% CI 7.6-46.7, p <0.001), and baby born with esophageal atresia (OR = 17.9, 95% CI, 4.6-68.9, p <0.001).

Conclusion
As described in other studies, birth defects and very preterm newborns showed the strongest association with neonatal mortality. One limitation of our study was that it was performed at a tertiary hospital and it would be interesting to validate our results in other settings of care in Angola. However, there is a need to strengthen and invest in care in Angola, particularly around the time of birth and the first week of life. Further, DBPH needs to ensure that all newborns have access to WHO recommended essential newborn care, especially preterm babies.
Association between Incidence of Hand-Foot-and-Mouth Disease and Meteorological Factors in Jiangyin City, China, 2012-2017

Mr. Jun Li, Ms. Yanru Zhang, Dr. Quan Chen, Dr. Rongqiang Zu

Background
Hand-Foot-and-Mouth Disease (HFMD) has become an increasing burden in the Asia Pacific Region including China. In order to take more effective measures to prevent HFMD, the impacts of meteorological factors on incidence of HFMD in Jiangyin City were explored.

Methods
The daily cases of HFMD from China Information System for Disease Control and Prevention and the date of daily average temperature, air pressure and relative humidity from National Meteorological Information Center were collected from 2012 to 2017 in Jiangyin City. Chi-square test, pearson correlation analysis and multiple linear regression were conducted to evaluated the association between the incidence of HFMD with meteorological factors by software SPSS 16.0.

Results
A total of 21791 HFMD cases were reported in Jiangyin City during 2012-2017, the yearly incidence rate was 131.09/100000 to 317.18/100000 and statistically significant fluctuation was observed ($\chi^2$ trend=99.85,$P<0.001$). There was a significant positive correlation between the daily incidence of HFMD with daily average temperature and daily average relative humidity ($r=0.364, P<0.001$; $r=0.085, P<0.001$), while negative correlation with daily average pressure was found ($r=-0.433,P<0.001$). Further analysis showed that the risk of HFMD was in the peak under the temperature of 20-30 $^\circ$C ($RR=7.74$), and the pressure of 1000-1010 hpa could have the greatest effect on HFMD ($RR=17.05$), and the relative humidity of 60%-80% might lead to the risk of HFMD in the highest level ($RR=1.30$). Multiple linear regression showed that both daily average temperature and daily mean pressure had an effect on the number of daily HFMD (both $P<0.05$).

Conclusion
Meteorological factors may have a significant impact on the incidence of HFMD in Jiangyin City. 20-30$^\circ$C,1000-1010hpa and relative humidity of 60%-80% may lead to the highest risk of HFMD, these data can certainly be used to strengthen surveillance systems in the early warning of HFMD.

Friday, 1st November - 11:30: Session D: Maternal and Child Health (Willow) - Oral - Abstract ID: 426

Dr. Victoria Fields, Dr. Norbert Soke, Dr. Ann Reynolds, Dr. Lin Tian, Dr. Lisa Wiggins, Dr. Matthew Maenner, Dr. Carolyn DiGuiseppi, Dr. Tanja Kral, Dr. Laura Schieve

Background
Pica, the repeated ingestion of nonfood items lacking nutritional value, has been reported in clinical samples of people with developmental disabilities (DDs). It is considered a type of self-injurious behavior (SIB), can result in life-threatening medical consequences, and studies suggest higher mortality rates for pica than for other types of SIB. Little is known about the prevalence of pica in children with or without DDs. Children with autism spectrum disorder (ASD), because of their high risk for SIB, may have a particularly high risk for pica. We assessed pica in children with and without ASD and other DDs.

Methods
We used data from the Study to Explore Early Development, a multi-site case-control study that includes 3–5 year-old children. Children with ASD (n=1426) and other (non-ASD) DDs (n=1735) were recruited from multiple clinics and schools at each site. Population-based controls (POP) (n=1578) were recruited from randomly-sampled birth records. We subdivided children with ASD according to whether they had intellectual disability (ID) and children with other DDs according to whether they had ID and/or some ASD characteristics. Data to define final case groups/subgroups were based on research-reliable developmental assessments. Pica was ascertained through parental report using a developmental assessment form. We examined pica prevalence in each group. We compared ASD and DD groups to the POP group via odds ratios (aOR) adjusted for maternal and child sociodemographic factors.

Results
Pica prevalence among POP controls was 3.5%. In comparison, pica was reported frequently in children with ASD+ID, ASD without ID and DDs that included either ID, ASD characteristics, or both (prevalence range 9.7% to 28.1% for these five groups). Differences between these ASD and DD group children and POP group children remained after adjustment (aOR range 2.6 to 10.4, all statistically significant). However, pica prevalence was not elevated in children with DD with neither ID nor ASD characteristics (3.2%, aOR=0.9).

Conclusion
Pica is common in young children with ASD, ASD characteristics, and/or ID. These findings inform the specialized healthcare needs of children with these conditions. Futures studies should provide more in-depth assessment of pica, including pica frequency, severity, and associated health consequences.
An institution-based study on risk factors associated with mortality in children under five years old with Severe Acute Malnutrition in Limpopo Province-South Africa, 2014-2018

Friday, 1st November - 11:50: Session D: Maternal and Child Health (Willow) - Oral - Abstract ID: 449

Ms. Fhatuwani Gavhi, Dr. Villyen Motaze, Dr. Lazarus Kuonza

Background
Mortality in children <5 with Severe Acute Malnutrition (SAM) reaches up to 30% in South Africa despite the implementation of the World Health Organization SAM management guidelines. We aimed to identify risk factors associated with mortality among children <5 hospitalized with SAM in Limpopo Province public hospitals from 2014 to 2018.

Methods
We conducted a cross-sectional review of hospital records of children <5 who were admitted with SAM in five hospitals of Limpopo Province. We extracted socio-demographic and clinical history data from hospital records using a data capture sheet. We used univariable and multivariable logistic regression to identify risk factors associated with mortality.

Results
We included 956 children with 480 (50.2%) males and 476 (49.8%) females. The median age was 13 months (range 2 to 59 months) with 73.8% (706/956) of the children aged between 7 and 24 months. Overall, 248 (25.9%) of 956 children with SAM died from 2014 to 2018. Diarrhoea and lower respiratory tract infections (LRTIs) were the most common complications with 610 (63.8%) and 405 (42.4%) cases respectively. Factors associated with mortality included history of herbal medication ingestion (adjusted Odds Ratio (aOR): 2.0, 95% Confidence Interval (CI): 1.2-3.4, p=0.007), diarrhoea (aOR: 1.9, 95% CI: 1.1-3.2, p=0.009), LRTIs (aOR: 1.6, 95% CI: 1.2-2.5, p=0.042), anemia (aOR: 4.3, 95% CI: 2.5-7.2, p<0.001), hypoglycemia (aOR: 12.7, 95% CI: 6.2-26.3, p<0.001) and human immunodeficiency virus (HIV) infection (aOR:1.8, 95% CI: 1.1-3.1, 0.016).

Conclusion
Herbal medication and health conditions such as diarrhoea, LRTIs, anemia, hypoglycemia and HIV infection were associated with increased mortality in children with SAM. These risk factors should be taken into consideration when managing children with SAM.
Microcephaly in neonates in the context of Zika epidemic-Metropolitan Region, Dominican Republic, 2016-2017

Friday, 1st November - 12:10: Session D: Maternal and Child Health (Willow) - Oral - Abstract ID: 625

Dr. Rannily Rojas, Dr. K. Romero, Dr. R. Pimentel

Background
In 2015, indigenous cases of Zika virus (ZIKV) were detected in Brazil; as well as an unusual increase in microcephaly in areas affected by outbreaks. In the Dominican Republic, the ZIKV epidemic began in January 2016, in the Metropolitan Region (MR), registering 486 suspected cases in pregnant women residing in MR; 36.2% (96/265) confirmed by laboratory. In 2016, microcephaly surveillance was initiated, 49% (42/85) of confirmed ZIKV microcephaly cases corresponded to MR. We set out to compare the prevalence of microcephaly in the epidemic and post-epidemic years of Zika.

Methods
Descriptive study using birth records of five hospitals where 61.3% of all births in the country occur. Case definition: all newborns (alive or dead) with head circumference (HC) at birth below -2 standard deviation (SD), according to the standardized INTERGROTHTH-21st references, considering the variations by gestational age and sex. Serious case if the HC was less than -3ED. We calculate frequency measurements, confidence intervals (95% CI) for microcephaly according to the age and nationality of the mother, type of pregnancy and childbirth, sex, gestational age.

Results
In 2016, 931 cases of microcephaly were identified in 34,649 births, for a prevalence of 2.69% [95% CI = 2.52-2.86]; no significant changes compared to 2017; 1057 cases were identified in 35,437 births 2.98% [95% CI = 2.81-3.16]. The prevalence of microcephaly (HC less than -2 ED) was higher in premature births 5.83% [5.08-6.58] and 5.76% [5.01-6.51], received vaginally 3.47% [3.18-3.76] and 3.67% [3.38-3.95] and multiple pregnancies 4.85% [3.45-6.24] and 7.26% [5.56-8.96], in 2016 and 2017 respectively. In the first half-2016, it was 2.19% [CI 95% = 1.96-2.42], while in the second half it increased to 3.10% [CI 95% = 2.85-3.34]. In contrast, during the first half of 2017, it was 2.50% [95% CI = 2.26-2.74], and in the second half of 3.37% [95% CI = 3.11-3.62].

Conclusion
There were no differences in the prevalence of microcephaly comparing the epidemic and post-epidemic year of Zika in the Dominican Republic. We recommend strengthening surveillance of congenital malformations and investigating the causes of microcephaly in the country.
Spousal Communication, Fertility Preference and Contraceptive Uptake Among Couples in Oyo State: A Rural-Urban Comparison

Friday, 1st November - 12:30: Session D: Maternal and Child Health (Willow) - Oral - Abstract ID: 585

**Dr. Lois Olajide, Dr. Ayodeji Ayodeji, Dr. Eniola Bamgboye, Dr. Muhammad Shakir Balogun**

**Background**
Increasing global population and its consequences constitutes a preeminent public health challenge. A key cost-effective intervention is the use of contraceptives whose uptake is still low especially in developing countries. Spousal communication (SC) and fertility preference (FP), known to be key determinants of contraceptive uptake (CU) have been studied mainly in isolation among women. We therefore examined the influence of these factors simultaneously amongst couples in rural and urban areas of Oyo state, Nigeria.

**Methods**
We conducted a comparative cross-sectional study among reproductive age women and their partners using a two-stage cluster sampling technique in one rural and one urban area of Oyo State. We collected data using semi-structured, interviewer-administered questionnaires. Key variables were CU, SC (measured using the SC index), and FP. Levels of agreement were determined using Cohen's kappa statistic. We identified predictors of CU by estimating adjusted odds ratios (aOR) and confidence intervals (CI) with multivariable logistic regression.

**Results**
Overall, 66.3% of the couples in the rural compared to 77.3% in the urban setting had good SC about family planning (p=0.003). A higher proportion of couples in rural (56.7%) compared to those in urban (43.3) desired more children (p<0.001). CU was similar in both areas (p= 0.541) (34.1% rural: 31.7 urban). Women with tertiary education (aOR=2.31; 95%CI=1.30-4.10), in the richer and richest wealth quintiles (aOR=1.82, 95%CI= 1.02-3.25) or with good SC (aOR= 2.86; 95%CI= 1.83-4.47) were more likely to use contraceptives. However, couples where both partners desire more children were less likely to use contraceptives (aOR=0.50; 95%CI= 0.27-0.95).

**Conclusion**
Our findings demonstrate low levels of CU and poor SC and desire for larger families were associated with this. We, therefore, recommend incorporating spousal communication in FP programs as well as focusing on couples, especially those with primary education and in the lower socioeconomic classes as previous attention had been solely on women to increase uptake of contraceptive use.
# Authors Index

<table>
<thead>
<tr>
<th>Authors</th>
<th>Page Numbers</th>
<th>Authors</th>
<th>Page Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abade, A.</td>
<td>7, 55, 77, 101, 150</td>
<td>Alfredo, R.</td>
<td>163</td>
</tr>
<tr>
<td>Abamuslimova, N.</td>
<td>3</td>
<td>Alhawarat, M.</td>
<td>125</td>
</tr>
<tr>
<td>Abate, G.</td>
<td>177</td>
<td>Aliddeki, D.</td>
<td>160</td>
</tr>
<tr>
<td>Abd-Elatif, E.</td>
<td>2</td>
<td>Aliyu Na’uzo, M.</td>
<td>12</td>
</tr>
<tr>
<td>Abdu-Aguiye, R.</td>
<td>103</td>
<td>Almeida, W.</td>
<td>53</td>
</tr>
<tr>
<td>Abdul Rahman, R.</td>
<td>62</td>
<td>Alomatu, H.</td>
<td>218</td>
</tr>
<tr>
<td>Abdullai, S.</td>
<td>107, 203</td>
<td>Alowfi, A.</td>
<td>99</td>
</tr>
<tr>
<td>Abdulmalik, Y.</td>
<td>10</td>
<td>Alredainy, R.</td>
<td>54</td>
</tr>
<tr>
<td>Abdulrahim, N.</td>
<td>122</td>
<td>Alves, R.</td>
<td>67</td>
</tr>
<tr>
<td>Abebe, A.</td>
<td>9</td>
<td>AMABO CHI, F.</td>
<td>128, 162</td>
</tr>
<tr>
<td>Abishek, S.</td>
<td>202</td>
<td>Amedzro, I.</td>
<td>63, 107, 203</td>
</tr>
<tr>
<td>Aboasba, B.</td>
<td>66</td>
<td>Ameme, D.</td>
<td>63, 84, 91, 107, 113, 218</td>
</tr>
<tr>
<td>Abu-Slaih, A.</td>
<td>50</td>
<td>Ametepi, D.</td>
<td>218</td>
</tr>
<tr>
<td>Aburoman, R.</td>
<td>50</td>
<td>Amo-Addae, M.</td>
<td>72</td>
</tr>
<tr>
<td>Achieng, C.</td>
<td>184</td>
<td>Amoabeng, A.</td>
<td>176</td>
</tr>
<tr>
<td>Adebowale, A.</td>
<td>164</td>
<td>Amoh-Youboah, A.</td>
<td>107</td>
</tr>
<tr>
<td>Adekanye, U.</td>
<td>137</td>
<td>Angleri, P.</td>
<td>129</td>
</tr>
<tr>
<td>Adeoye, I.</td>
<td>215</td>
<td>Ansa, G.</td>
<td>176</td>
</tr>
<tr>
<td>Adewuyi, P.</td>
<td>72, 141</td>
<td>António, R.</td>
<td>163</td>
</tr>
<tr>
<td>Afari, E.</td>
<td>63, 91, 176, 218</td>
<td>ANYA, p.</td>
<td>128</td>
</tr>
<tr>
<td>Agarwal, Y.</td>
<td>42</td>
<td>Apolot, R.</td>
<td>31</td>
</tr>
<tr>
<td>Agostini, M.</td>
<td>67</td>
<td>Aqel, A.</td>
<td>125</td>
</tr>
<tr>
<td>Aguedey, D.</td>
<td>107, 203</td>
<td>Ario, A.</td>
<td>86, 120, 160, 181</td>
</tr>
<tr>
<td>AHID, S.</td>
<td>146</td>
<td>Armendariz, S.</td>
<td>129</td>
</tr>
<tr>
<td>Ahmad, J.</td>
<td>82</td>
<td>Armstrong, B.</td>
<td>30</td>
</tr>
<tr>
<td>Ahmed, D.</td>
<td>18</td>
<td>Arthur Quarm, J.</td>
<td>63</td>
</tr>
<tr>
<td>Ahmed, M.</td>
<td>147</td>
<td>Asaad, M.</td>
<td>50</td>
</tr>
<tr>
<td>Ahmed, R.</td>
<td>198</td>
<td>ASSARAG, B.</td>
<td>60, 70, 96, 121, 146, 151, 180</td>
</tr>
<tr>
<td>Ajayi, I.</td>
<td>149, 164</td>
<td>Assefa, Z.</td>
<td>177</td>
</tr>
<tr>
<td>Ajumobi, O.</td>
<td>12, 102, 164, 212</td>
<td>ASUNDUWA, K.</td>
<td>194</td>
</tr>
<tr>
<td>Akos Odikro, M.</td>
<td>58, 113, 218</td>
<td>ATEBA ABINA, A.</td>
<td>73</td>
</tr>
<tr>
<td>akrim, M.</td>
<td>121</td>
<td>Atsu-Agbo Agboyie, D.</td>
<td>63</td>
</tr>
<tr>
<td>Akulumo, M.</td>
<td>80</td>
<td>Attia, R.</td>
<td>138</td>
</tr>
<tr>
<td>Al Amad, M.</td>
<td>10, 66</td>
<td>AVCI, E.</td>
<td>158</td>
</tr>
<tr>
<td>Al Serouri, A.</td>
<td>10</td>
<td>Avelino, F.</td>
<td>36, 38, 65, 89, 166, 169</td>
</tr>
<tr>
<td>Al-Esawi, H.</td>
<td>99</td>
<td>Aworh, M.</td>
<td>33, 194, 215</td>
</tr>
<tr>
<td>Alden, N.</td>
<td>95</td>
<td>Ayepah, C.</td>
<td>107</td>
</tr>
<tr>
<td>Name</td>
<td>Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ayodeji, A.</td>
<td>227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ayugi, B.</td>
<td>144</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Azam, N.</td>
<td>106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babirye, S.</td>
<td>80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babu, B.</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Badar, I.</td>
<td>198</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bagina, J.</td>
<td>203</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bah, M.</td>
<td>127</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bah, N.</td>
<td>141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baig, M.</td>
<td>93, 198</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bainomugisha, K.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bakiika, H.</td>
<td>45, 184</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baldeh, I.</td>
<td>141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balinandi, S.</td>
<td>32, 86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balogun, M.</td>
<td>12, 34, 59, 81, 102, 103, 137, 149, 164, 194, 207, 212, 215, 227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bamberg, W.</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bamgboye, E.</td>
<td>102, 212, 227</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banda, J.</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandeira, L.</td>
<td>189</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandoh, D.</td>
<td>63, 84, 113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangure, D.</td>
<td>92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banwell, C.</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bara, H.</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barcena Barbeira, P.</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bareja, C.</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrera, C.</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barreto, G.</td>
<td>67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barter, D.</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bashir, T.</td>
<td>106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Batista, D.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bauri, M.</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bekele, a.</td>
<td>188</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belakhel, L.</td>
<td>96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BELALIA, A.</td>
<td>60, 70, 96, 121, 146, 151, 180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belongia, E.</td>
<td>69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ben Alaya, N.</td>
<td>105, 210</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BENFOUILA, F.</td>
<td>151</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bernard, J.</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bernard, S.</td>
<td>37, 161</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Betancourt, C.</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>beyene, d.</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bezerra Monteiro de Oliveira, A.</td>
<td>130</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bhatnagar, P.</td>
<td>18</td>
</tr>
<tr>
<td>BILLONG, S.</td>
<td>162</td>
</tr>
<tr>
<td>binbin, h.</td>
<td>25</td>
</tr>
<tr>
<td>Biondo, E.</td>
<td>129</td>
</tr>
<tr>
<td>Birungi, D.</td>
<td>86</td>
</tr>
<tr>
<td>Bishara Daggash, B.</td>
<td>59</td>
</tr>
<tr>
<td>Bizuneh, H.</td>
<td>177</td>
</tr>
<tr>
<td>Blanco, M.</td>
<td>38</td>
</tr>
<tr>
<td>Boateng, G.</td>
<td>63</td>
</tr>
<tr>
<td>BOFIA BOYOUGUENO, H.</td>
<td>88</td>
</tr>
<tr>
<td>BOHIMBO M., R.</td>
<td>88, 162</td>
</tr>
<tr>
<td>Bonaya, N.</td>
<td>116</td>
</tr>
<tr>
<td>Boopathi, K.</td>
<td>153</td>
</tr>
<tr>
<td>Borg, M.</td>
<td>165</td>
</tr>
<tr>
<td>bourjilate, f.</td>
<td>121</td>
</tr>
<tr>
<td>Brice Wilfrid, B.</td>
<td>37</td>
</tr>
<tr>
<td>Brodkin, A.</td>
<td>204</td>
</tr>
<tr>
<td>Brousseau, B.</td>
<td>204</td>
</tr>
<tr>
<td>Brousseau, G.</td>
<td>95</td>
</tr>
<tr>
<td>Brown, J.</td>
<td>61</td>
</tr>
<tr>
<td>Bruce, M.</td>
<td>186</td>
</tr>
<tr>
<td>Bruden, D.</td>
<td>186</td>
</tr>
<tr>
<td>Bruzadelli, F.</td>
<td>53</td>
</tr>
<tr>
<td>Bukassa, G.</td>
<td>60, 121</td>
</tr>
<tr>
<td>Bulage, L.</td>
<td>160, 181</td>
</tr>
<tr>
<td>Bunani, N.</td>
<td>148</td>
</tr>
<tr>
<td>Burakoff, A.</td>
<td>95</td>
</tr>
<tr>
<td>Burdorff, A.</td>
<td>95</td>
</tr>
<tr>
<td>Buregyeya, E.</td>
<td>135</td>
</tr>
<tr>
<td>Butt, T.</td>
<td>106</td>
</tr>
<tr>
<td>Buxton, J.</td>
<td>155</td>
</tr>
<tr>
<td>Cagadas, J.</td>
<td>166</td>
</tr>
<tr>
<td>Cai, J.</td>
<td>74</td>
</tr>
<tr>
<td>Calvo, V.</td>
<td>129</td>
</tr>
<tr>
<td>Camphor, H.</td>
<td>26</td>
</tr>
<tr>
<td>Castro, L.</td>
<td>142</td>
</tr>
<tr>
<td>Cañal, E.</td>
<td>36, 166, 169</td>
</tr>
<tr>
<td>CETIN COBAN, S.</td>
<td>205</td>
</tr>
<tr>
<td>Chackly, F.</td>
<td>16, 168</td>
</tr>
<tr>
<td>Chai, S.</td>
<td>204</td>
</tr>
<tr>
<td>Chanachai, K.</td>
<td>124</td>
</tr>
<tr>
<td>Chang, Z.</td>
<td>44, 171</td>
</tr>
<tr>
<td>Chaoui, A.</td>
<td>96</td>
</tr>
<tr>
<td>Name</td>
<td>Page Reference</td>
</tr>
<tr>
<td>--------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Charaa, N.</td>
<td>105</td>
</tr>
<tr>
<td>Che Mat Din, S.</td>
<td>76</td>
</tr>
<tr>
<td>Chen, A.</td>
<td>204</td>
</tr>
<tr>
<td>Chen, J.</td>
<td>40</td>
</tr>
<tr>
<td>Chen, Q.</td>
<td>223</td>
</tr>
<tr>
<td>CHERKAOUI, I.</td>
<td>121</td>
</tr>
<tr>
<td>Chery, O.</td>
<td>132</td>
</tr>
<tr>
<td>Chibuye, S.</td>
<td>159</td>
</tr>
<tr>
<td>Chin nayah, T.</td>
<td>76</td>
</tr>
<tr>
<td>Chipendo, T.</td>
<td>64</td>
</tr>
<tr>
<td>Chiwanda, S.</td>
<td>64, 92, 100, 195, 217</td>
</tr>
<tr>
<td>Chochua, S.</td>
<td>95</td>
</tr>
<tr>
<td>Chonzi, P.</td>
<td>100</td>
</tr>
<tr>
<td>Choudhary, S.</td>
<td>42, 68</td>
</tr>
<tr>
<td>Chu, T.</td>
<td>15</td>
</tr>
<tr>
<td>Chuang, S.</td>
<td>167</td>
</tr>
<tr>
<td>Chung, J.</td>
<td>69</td>
</tr>
<tr>
<td>Cilwick, A.</td>
<td>95</td>
</tr>
<tr>
<td>Clamor, F.</td>
<td>65</td>
</tr>
<tr>
<td>Clements, M.</td>
<td>30</td>
</tr>
<tr>
<td>Coimbra, L.</td>
<td>67</td>
</tr>
<tr>
<td>Competiello, N.</td>
<td>129</td>
</tr>
<tr>
<td>Conteh, A.</td>
<td>119</td>
</tr>
<tr>
<td>Corlins, N.</td>
<td>73, 175</td>
</tr>
<tr>
<td>Corvil, S.</td>
<td>17, 127</td>
</tr>
<tr>
<td>Cruz, A.</td>
<td>163</td>
</tr>
<tr>
<td>Cueto, M.</td>
<td>57</td>
</tr>
<tr>
<td>Cueto, S.</td>
<td>57</td>
</tr>
<tr>
<td>Dagnra, A.</td>
<td>140</td>
</tr>
<tr>
<td>Dahbi, i.</td>
<td>146</td>
</tr>
<tr>
<td>Dairo, M.</td>
<td>81, 102, 212</td>
</tr>
<tr>
<td>Dale, A.</td>
<td>95</td>
</tr>
<tr>
<td>Dael, m.</td>
<td>210</td>
</tr>
<tr>
<td>Dalhat, M.</td>
<td>103, 207</td>
</tr>
<tr>
<td>Dan-Nwafor, C.</td>
<td>34</td>
</tr>
<tr>
<td>Dawa, S.</td>
<td>128</td>
</tr>
<tr>
<td>Dadmulira, J.</td>
<td>45</td>
</tr>
<tr>
<td>De Guzman, A.</td>
<td>36, 38, 65, 89, 166, 169</td>
</tr>
<tr>
<td>de los Reyes, V.</td>
<td>38, 65, 89</td>
</tr>
<tr>
<td>Demas, S.</td>
<td>114</td>
</tr>
<tr>
<td>Deml, S.</td>
<td>152</td>
</tr>
<tr>
<td>Derseh, L.</td>
<td>109</td>
</tr>
<tr>
<td>Dhliwayo, T.</td>
<td>195</td>
</tr>
<tr>
<td>Diallo R.M., F.</td>
<td>37, 161</td>
</tr>
<tr>
<td>Dias, J.</td>
<td>222</td>
</tr>
<tr>
<td>Diaz, J.</td>
<td>129</td>
</tr>
<tr>
<td>Di Guseppi, C.</td>
<td>224</td>
</tr>
<tr>
<td>Dikid, T.</td>
<td>42</td>
</tr>
<tr>
<td>Ding, X.</td>
<td>201</td>
</tr>
<tr>
<td>Dirbi, J.</td>
<td>147</td>
</tr>
<tr>
<td>DISSONGO, J.</td>
<td>162</td>
</tr>
<tr>
<td>Dixon, M.</td>
<td>83</td>
</tr>
<tr>
<td>Dijkeussi Katcho, T.</td>
<td>162</td>
</tr>
<tr>
<td>Domawa, A.</td>
<td>119</td>
</tr>
<tr>
<td>Dominguez, C.</td>
<td>129</td>
</tr>
<tr>
<td>Dor, V.</td>
<td>132</td>
</tr>
<tr>
<td>DOSSIM, S.</td>
<td>140</td>
</tr>
<tr>
<td>Doumbouya, F.</td>
<td>17</td>
</tr>
<tr>
<td>Dsane-Aidoo, P.</td>
<td>218</td>
</tr>
<tr>
<td>Dsani, E.</td>
<td>91</td>
</tr>
<tr>
<td>Duan, W.</td>
<td>209</td>
</tr>
<tr>
<td>Duba, Q.</td>
<td>22</td>
</tr>
<tr>
<td>Efouba Mvondo, G.</td>
<td>175</td>
</tr>
<tr>
<td>Egyir, B.</td>
<td>91</td>
</tr>
<tr>
<td>Ekirapa, E.</td>
<td>31</td>
</tr>
<tr>
<td>Ekiri, A.</td>
<td>137</td>
</tr>
<tr>
<td>Elazhari, m.</td>
<td>121</td>
</tr>
<tr>
<td>Elghazaly, M.</td>
<td>23</td>
</tr>
<tr>
<td>Eliah, P.</td>
<td>150</td>
</tr>
<tr>
<td>Elliot, A.</td>
<td>214</td>
</tr>
<tr>
<td>Elmdaghr, n.</td>
<td>121</td>
</tr>
<tr>
<td>Elías, J.</td>
<td>129</td>
</tr>
<tr>
<td>Ephadze, N.</td>
<td>117, 136</td>
</tr>
<tr>
<td>Epson, E.</td>
<td>204</td>
</tr>
<tr>
<td>Epulimara, P.</td>
<td>184</td>
</tr>
<tr>
<td>ESSO ENDALLE, L.</td>
<td>56</td>
</tr>
<tr>
<td>Essumanma Houphouet, E.</td>
<td>176</td>
</tr>
<tr>
<td>Eteng, W.</td>
<td>34</td>
</tr>
<tr>
<td>ETOUNDI MBALLA, G.</td>
<td>56, 73, 88, 128, 162, 175, 221</td>
</tr>
<tr>
<td>Eurien, D.</td>
<td>120, 181</td>
</tr>
<tr>
<td>EVOUNA, A.</td>
<td>73, 128, 162, 175, 221</td>
</tr>
<tr>
<td>EZZINE, H.</td>
<td>121, 180</td>
</tr>
<tr>
<td>faddane, k.</td>
<td>121</td>
</tr>
<tr>
<td>Faisal, D.</td>
<td>46</td>
</tr>
<tr>
<td>Faiyaz, A.</td>
<td>38</td>
</tr>
<tr>
<td>Faria, F.</td>
<td>67</td>
</tr>
<tr>
<td>Name</td>
<td>Page Numbers</td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Fawole, O.</td>
<td>81, 215</td>
</tr>
<tr>
<td>Felix, B.</td>
<td>222</td>
</tr>
<tr>
<td>Feng, J.</td>
<td>43</td>
</tr>
<tr>
<td>Feng, L.</td>
<td>209</td>
</tr>
<tr>
<td>Ferreira, M.</td>
<td>53</td>
</tr>
<tr>
<td>Ferrieri, P.</td>
<td>152</td>
</tr>
<tr>
<td>Fetuga, A.</td>
<td>102, 215</td>
</tr>
<tr>
<td>Fevre, E.</td>
<td>183</td>
</tr>
<tr>
<td>Field, E.</td>
<td>110</td>
</tr>
<tr>
<td>Fields, V.</td>
<td>224</td>
</tr>
<tr>
<td>Flannery, B.</td>
<td>69</td>
</tr>
<tr>
<td>Flint, J.</td>
<td>11</td>
</tr>
<tr>
<td>Fontenot, J.</td>
<td>204</td>
</tr>
<tr>
<td>Forsting, S.</td>
<td>15</td>
</tr>
<tr>
<td>Fotakis, M.</td>
<td>165</td>
</tr>
<tr>
<td>Frank, C.</td>
<td>34</td>
</tr>
<tr>
<td>Frederick, M.</td>
<td>27</td>
</tr>
<tr>
<td>Frimpong, J.</td>
<td>113</td>
</tr>
<tr>
<td>Fry, A.</td>
<td>69</td>
</tr>
<tr>
<td>Fuertes, L.</td>
<td>142</td>
</tr>
<tr>
<td>Gabalfin, P.</td>
<td>166</td>
</tr>
<tr>
<td>Gachari, M.</td>
<td>83</td>
</tr>
<tr>
<td>Gaglani, M.</td>
<td>69</td>
</tr>
<tr>
<td>Galdavadze, K.</td>
<td>117</td>
</tr>
<tr>
<td>Galgalo, T.</td>
<td>83</td>
</tr>
<tr>
<td>Galipo, E.</td>
<td>137</td>
</tr>
<tr>
<td>Gallick Bertolucci, R.</td>
<td>204</td>
</tr>
<tr>
<td>Gama, A.</td>
<td>170</td>
</tr>
<tr>
<td>Ganeshkumar, P.</td>
<td>139</td>
</tr>
<tr>
<td>Gao, S.</td>
<td>39</td>
</tr>
<tr>
<td>Gathecha, G.</td>
<td>192</td>
</tr>
<tr>
<td>Gaub, K.</td>
<td>61</td>
</tr>
<tr>
<td>Gautier, J.</td>
<td>132</td>
</tr>
<tr>
<td>Gavhi, F.</td>
<td>225</td>
</tr>
<tr>
<td>Gbondo, A.</td>
<td>114</td>
</tr>
<tr>
<td>Gebech, G.</td>
<td>114, 119</td>
</tr>
<tr>
<td>Geleisvili, M.</td>
<td>75</td>
</tr>
<tr>
<td>Gemechu, D.</td>
<td>177</td>
</tr>
<tr>
<td>Gemedu, D.</td>
<td>197</td>
</tr>
<tr>
<td>Genchwere, J.</td>
<td>131</td>
</tr>
<tr>
<td>Ghafari, C.</td>
<td>15</td>
</tr>
<tr>
<td>Ghrah, R.</td>
<td>105</td>
</tr>
<tr>
<td>Gibson, J.</td>
<td>77, 101</td>
</tr>
<tr>
<td>Gidado, S.</td>
<td>103</td>
</tr>
<tr>
<td>Githuku, J.</td>
<td>83</td>
</tr>
<tr>
<td>Glynn-Robinson, A.</td>
<td>26</td>
</tr>
<tr>
<td>GODONOU, A.</td>
<td>140</td>
</tr>
<tr>
<td>Gombe, N.</td>
<td>64, 92, 100, 195, 217</td>
</tr>
<tr>
<td>Goulbourne, L.</td>
<td>209</td>
</tr>
<tr>
<td>Govha, E.</td>
<td>64</td>
</tr>
<tr>
<td>Grajeda, P.</td>
<td>13</td>
</tr>
<tr>
<td>Guerra, M.</td>
<td>114, 119</td>
</tr>
<tr>
<td>Guo, Z.</td>
<td>209</td>
</tr>
<tr>
<td>Hakizimana, L.</td>
<td>114, 119</td>
</tr>
<tr>
<td>HALATOKO, W.</td>
<td>140</td>
</tr>
<tr>
<td>HAMDI, A.</td>
<td>70</td>
</tr>
<tr>
<td>Hammer, G.</td>
<td>204</td>
</tr>
<tr>
<td>Han, Y.</td>
<td>44</td>
</tr>
<tr>
<td>Hancock, A.</td>
<td>61</td>
</tr>
<tr>
<td>Hansen, G.</td>
<td>152</td>
</tr>
<tr>
<td>Hara, Y.</td>
<td>196</td>
</tr>
<tr>
<td>Hariri, S.</td>
<td>19</td>
</tr>
<tr>
<td>Harriet, G.</td>
<td>176</td>
</tr>
<tr>
<td>Harrison, R.</td>
<td>27</td>
</tr>
<tr>
<td>Harvey, P.</td>
<td>18, 68</td>
</tr>
<tr>
<td>Hassan, H.</td>
<td>62</td>
</tr>
<tr>
<td>Heinzerling, A.</td>
<td>27</td>
</tr>
<tr>
<td>Helena Cezar, M.</td>
<td>130</td>
</tr>
<tr>
<td>Henley, S.</td>
<td>204</td>
</tr>
<tr>
<td>Herlihy, R.</td>
<td>95</td>
</tr>
<tr>
<td>Hessissn, L.</td>
<td>146</td>
</tr>
<tr>
<td>Hidayati, T.</td>
<td>4</td>
</tr>
<tr>
<td>Higa, J.</td>
<td>204</td>
</tr>
<tr>
<td>Hoang Nghia, T.</td>
<td>211</td>
</tr>
<tr>
<td>Hussain, A.</td>
<td>71</td>
</tr>
<tr>
<td>Hussain, M.</td>
<td>93</td>
</tr>
<tr>
<td>Hussein, A.</td>
<td>16</td>
</tr>
<tr>
<td>Huynh, T.</td>
<td>204</td>
</tr>
<tr>
<td>Iblan, I.</td>
<td>125</td>
</tr>
<tr>
<td>Idris, S.</td>
<td>164</td>
</tr>
<tr>
<td>Idubor, O.</td>
<td>95</td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Ihekweazu, C.</td>
<td>34, 207</td>
</tr>
<tr>
<td>Ikoona, E.</td>
<td>114, 119</td>
</tr>
<tr>
<td>Ikwunne, O.</td>
<td>149</td>
</tr>
<tr>
<td>Ilboudo, S.</td>
<td>37</td>
</tr>
<tr>
<td>Ilori, E.</td>
<td>34</td>
</tr>
<tr>
<td>Ingwani, A.</td>
<td>64</td>
</tr>
<tr>
<td>Ipadeola, O.</td>
<td>34</td>
</tr>
<tr>
<td>Irungu, J.</td>
<td>83</td>
</tr>
<tr>
<td>Ismail, R.</td>
<td>62</td>
</tr>
<tr>
<td>Ismail, T.</td>
<td>198</td>
</tr>
<tr>
<td>Issaka, Y.</td>
<td>37</td>
</tr>
<tr>
<td>Isuju, J.</td>
<td>98</td>
</tr>
<tr>
<td>Iturra, A.</td>
<td>129</td>
</tr>
<tr>
<td>Iwade, Y.</td>
<td>196</td>
</tr>
<tr>
<td>Jablonski-Sheffield, M.</td>
<td>204</td>
</tr>
<tr>
<td>Jackson, L.</td>
<td>69</td>
</tr>
<tr>
<td>Jackson, M.</td>
<td>69</td>
</tr>
<tr>
<td>Jackson, R.</td>
<td>27</td>
</tr>
<tr>
<td>Jacob, B.</td>
<td>77, 156</td>
</tr>
<tr>
<td>Jain, S.</td>
<td>42, 204</td>
</tr>
<tr>
<td>Jakeli, M.</td>
<td>117</td>
</tr>
<tr>
<td>Jallow, A.</td>
<td>141</td>
</tr>
<tr>
<td>Jallow, M.</td>
<td>141</td>
</tr>
<tr>
<td>James, C.</td>
<td>214</td>
</tr>
<tr>
<td>Jammeh, A.</td>
<td>141</td>
</tr>
<tr>
<td>Jaramillo Corrales, A.</td>
<td>13</td>
</tr>
<tr>
<td>Jaruwattananon, T.</td>
<td>124</td>
</tr>
<tr>
<td>Javed, S.</td>
<td>29</td>
</tr>
<tr>
<td>Jedrzejowski, H.</td>
<td>15</td>
</tr>
<tr>
<td>Jiang, K.</td>
<td>25</td>
</tr>
<tr>
<td>Jimoh, O.</td>
<td>59</td>
</tr>
<tr>
<td>Johnston, H.</td>
<td>95</td>
</tr>
<tr>
<td>Juru, T.</td>
<td>64, 92, 100, 195, 217</td>
</tr>
<tr>
<td>Jusof, Z.</td>
<td>62</td>
</tr>
<tr>
<td>Juya, A.</td>
<td>77</td>
</tr>
<tr>
<td>K J, R.</td>
<td>18</td>
</tr>
<tr>
<td>K. Pauline, Y.</td>
<td>37, 161</td>
</tr>
<tr>
<td>Kabuswe, K.</td>
<td>5</td>
</tr>
<tr>
<td>Kabwama, S.</td>
<td>86</td>
</tr>
<tr>
<td>Kadobra, D.</td>
<td>120, 160, 181</td>
</tr>
<tr>
<td>Kaevakore, M.</td>
<td>11</td>
</tr>
<tr>
<td>KAHHOULI, M.</td>
<td>70</td>
</tr>
<tr>
<td>Kakulu, R.</td>
<td>150</td>
</tr>
<tr>
<td>Kalil, F.</td>
<td>197</td>
</tr>
<tr>
<td>Kamarudin, M.</td>
<td>62</td>
</tr>
<tr>
<td>Kamazizwa, V.</td>
<td>64</td>
</tr>
<tr>
<td>KAME, V.</td>
<td>162</td>
</tr>
<tr>
<td>Kamei, S.</td>
<td>71</td>
</tr>
<tr>
<td>KAMGA, Y.</td>
<td>162</td>
</tr>
<tr>
<td>Kamiya, H.</td>
<td>196</td>
</tr>
<tr>
<td>Kamukama, A.</td>
<td>184</td>
</tr>
<tr>
<td>Kanaya, Y.</td>
<td>196</td>
</tr>
<tr>
<td>Kanchanasaka, B.</td>
<td>124</td>
</tr>
<tr>
<td>Kane, M.</td>
<td>161</td>
</tr>
<tr>
<td>Karmarkar, E.</td>
<td>204</td>
</tr>
<tr>
<td>Kasapo, C.</td>
<td>159</td>
</tr>
<tr>
<td>kasika, m.</td>
<td>131</td>
</tr>
<tr>
<td>Kasongo Kayembe, J.</td>
<td>17</td>
</tr>
<tr>
<td>Kasuji, F.</td>
<td>144</td>
</tr>
<tr>
<td>Kauki, G.</td>
<td>7</td>
</tr>
<tr>
<td>Kawakami, C.</td>
<td>196</td>
</tr>
<tr>
<td>Kayiwa, J.</td>
<td>160</td>
</tr>
<tr>
<td>Kazauro, M.</td>
<td>156</td>
</tr>
<tr>
<td>Kebede, G.</td>
<td>193</td>
</tr>
<tr>
<td>Keita, S.</td>
<td>17, 127</td>
</tr>
<tr>
<td>Kelly, E.</td>
<td>204</td>
</tr>
<tr>
<td>Khamasi, E.</td>
<td>63, 84, 91, 107, 113, 176, 203, 218</td>
</tr>
<tr>
<td>Khader, Y.</td>
<td>117, 136</td>
</tr>
<tr>
<td>Khan, F.</td>
<td>50</td>
</tr>
<tr>
<td>Khattabi, A.</td>
<td>173</td>
</tr>
<tr>
<td>Khemtong, S.</td>
<td>70, 180</td>
</tr>
<tr>
<td>Khetsuriani, N.</td>
<td>124</td>
</tr>
<tr>
<td>Khoza, B.</td>
<td>75</td>
</tr>
<tr>
<td>Khttab, M.</td>
<td>5</td>
</tr>
<tr>
<td>Kibira, S.</td>
<td>146</td>
</tr>
<tr>
<td>Kibuule, M.</td>
<td>80</td>
</tr>
<tr>
<td>kigen, f.</td>
<td>187</td>
</tr>
<tr>
<td>Kihara, R.</td>
<td>83</td>
</tr>
<tr>
<td>Kiku, B.</td>
<td>184</td>
</tr>
<tr>
<td>Kim, J.</td>
<td>204</td>
</tr>
<tr>
<td>KIMANGA, P.</td>
<td>168</td>
</tr>
<tr>
<td>KINDE, R.</td>
<td>140</td>
</tr>
<tr>
<td>Kinyaru, E.</td>
<td>47</td>
</tr>
<tr>
<td>Kirk, M.</td>
<td>30</td>
</tr>
<tr>
<td>Name</td>
<td>Pages</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Kisaakye, E.</td>
<td>86, 120</td>
</tr>
<tr>
<td>Kisaka, S.</td>
<td>135</td>
</tr>
<tr>
<td>Kisaky, A.</td>
<td>98, 148, 184</td>
</tr>
<tr>
<td>Kisangau, E.</td>
<td>82, 116</td>
</tr>
<tr>
<td>Kishimba, R.</td>
<td>7, 16, 87, 101, 131, 150, 168</td>
</tr>
<tr>
<td>Kissi-Appiah, E.</td>
<td>113</td>
</tr>
<tr>
<td>Kissinga, H.</td>
<td>87</td>
</tr>
<tr>
<td>Kiwanuka, G.</td>
<td>98</td>
</tr>
<tr>
<td>Klena, J.</td>
<td>32</td>
</tr>
<tr>
<td>Kobusingye, O.</td>
<td>98</td>
</tr>
<tr>
<td>Kohler, P.</td>
<td>77</td>
</tr>
<tr>
<td>KOKI NDOMBO, P.</td>
<td>221</td>
</tr>
<tr>
<td>Komakhidze, T.</td>
<td>75</td>
</tr>
<tr>
<td>Korda, R.</td>
<td>30</td>
</tr>
<tr>
<td>KOUAMEN TCHOUNKEU, G.</td>
<td>56</td>
</tr>
<tr>
<td>Kral, T.</td>
<td>224</td>
</tr>
<tr>
<td>Krievins, P.</td>
<td>61</td>
</tr>
<tr>
<td>kumar, K.</td>
<td>18</td>
</tr>
<tr>
<td>Kumar, S.</td>
<td>93</td>
</tr>
<tr>
<td>Kumar, V.</td>
<td>68</td>
</tr>
<tr>
<td>Kuncoro, T.</td>
<td>154</td>
</tr>
<tr>
<td>Kuo, M.</td>
<td>155</td>
</tr>
<tr>
<td>Kuonza, L.</td>
<td>79, 225</td>
</tr>
<tr>
<td>Kurup, K.</td>
<td>219</td>
</tr>
<tr>
<td>Kussevi, M.</td>
<td>51</td>
</tr>
<tr>
<td>Kusuhara, H.</td>
<td>196</td>
</tr>
<tr>
<td>Kwaga, J.</td>
<td>33</td>
</tr>
<tr>
<td>KWECHE PETCHU, C.</td>
<td>128</td>
</tr>
<tr>
<td>Kwesiga, B.</td>
<td>86, 120</td>
</tr>
<tr>
<td>Kwofie, V.</td>
<td>107, 203</td>
</tr>
<tr>
<td>Kyeremaa Yeboa, N.</td>
<td>58</td>
</tr>
<tr>
<td>Kyondo, J.</td>
<td>32</td>
</tr>
<tr>
<td>LAAKABI, F.</td>
<td>180</td>
</tr>
<tr>
<td>Ladva, C.</td>
<td>69</td>
</tr>
<tr>
<td>Lakranbi, M.</td>
<td>121, 180</td>
</tr>
<tr>
<td>Lal, R.</td>
<td>41</td>
</tr>
<tr>
<td>Lam, Y.</td>
<td>167</td>
</tr>
<tr>
<td>Lambert, S.</td>
<td>110</td>
</tr>
<tr>
<td>Lambonkale, A.</td>
<td>60</td>
</tr>
<tr>
<td>Lami, F.</td>
<td>54</td>
</tr>
<tr>
<td>Lansana, P.</td>
<td>119</td>
</tr>
<tr>
<td>Larco, G.</td>
<td>129</td>
</tr>
<tr>
<td>Laurent, M.</td>
<td>37</td>
</tr>
</tbody>
</table>
MAJIDI, H. 180 Mhembe, C. 64
Makayoto, L. 20, 22 Mhiche, A. 150
Makhlof, M. 105 Mhondoro, M. 92
Makumbi, F. 144 Migambi, P. 94
Malgwi, A. 207 Mill, C. 155
Malo, J. 110 Mirembe, B. 86
Malta, J. 67 Mirembe, R. 184
Mamytkanova, B. 174 Mishra, A. 42
Manickam, P. 153, 202, 219 Misombo Kalabela, A. 60, 140
Mansour, A. 133 Mizunduko, M. 168
Mansur, E. 106 Mkupasi, E. 131
Manzanero, R. 112 mmbaga, E. 55
Maramraj, K. 42 Moges, B. 177
Martin, E. 69 Moghalles, S. 66
Maseghe, P. 192 Mohammed, B. 137
Massa, K. 150 Mohd Arshad, A. 62
Masum Billah, M. 173 Monje, F. 120, 160
Materna, B. 27 Monto, A. 69
Mathias, N. 161 Moraes, C. 67
Matjokotja, T. 79 Morakinyo, O. 215
Matsui, T. 196 Morbey, R. 214
Maurice Rocher, M. 175, 221 Morris, J. 186
Mba, N. 33 Moshiro, C. 101
Mbai, J. 183 MOSSI MAKEMBE, H. 162
Mbatha, D. 22 Motaze, V. 225
MBENGUE, J. 162 moumnni Abdou, h. 121
MBOKE EKOUM, E. 175 mounach, s. 96
Mbona Tumwesigye, N. 98 Moyo, S. 79
McCollum, A. 119 Mucyo, Y. 94
Mcharo, J. 7 Mukete-Hilundutah, E. 24, 134
McLean, H. 69 Mulambya, J. 5
McMahon, B. 186 Mulambya, N. 5, 159
Md. Shamsuzzaman, S. 173 Mulei, S. 32
Mdose, H. 79 Muneza, F. 98
Mediaide Carrera, R. 165 Murhekar, M. 123
Melillo, T. 165 Musarurwa, P. 64, 100
Melita, M. 20, 187 Musewa, A. 86
Memon, N. 93 Mushangwe, B. 64
MENDJIME, P. 128 Mutebi, A. 31
MENGUE ESSINDI, A. 88 Mutebe, B. 195
Mensah, E. 107, 203 Mutethya, G. 20
MESKI, F. 96, 151 Muwangunzi, P. 58
Mghamba, J. 7, 77, 131 Muwanguzi, D. 86
Mhamdi, M. 210 Muñoz, M. 142
<table>
<thead>
<tr>
<th>Name</th>
<th>Page</th>
<th>Other Names</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>MWAKAPASA, E.</td>
<td>55</td>
<td>Njoroge, S.</td>
<td>183</td>
</tr>
<tr>
<td>Mwaningange, I.</td>
<td>182</td>
<td>Nooh, R.</td>
<td>99</td>
</tr>
<tr>
<td>Mwavita, J.</td>
<td>82</td>
<td>Noor, A.</td>
<td>83</td>
</tr>
<tr>
<td>Mwenda, V.</td>
<td>192</td>
<td>Noora, C.</td>
<td>203</td>
</tr>
<tr>
<td>Mwewa, H.</td>
<td>5</td>
<td>NORADECHANON, K.</td>
<td>124</td>
</tr>
<tr>
<td>Mzjaji, A.</td>
<td>99</td>
<td>Nortey, P.</td>
<td>176, 218</td>
</tr>
<tr>
<td>Mzjaji, J.</td>
<td>99</td>
<td>Nounan, G.</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Noveau, P.</td>
<td>129</td>
</tr>
<tr>
<td>Nabunya, P.</td>
<td>184</td>
<td>Nowalk, M.</td>
<td>69</td>
</tr>
<tr>
<td>Nagu, N.</td>
<td>150</td>
<td>Nserekho, G.</td>
<td>160</td>
</tr>
<tr>
<td>Nah, E.</td>
<td>112</td>
<td>Nshimiyamana, L.</td>
<td>52</td>
</tr>
<tr>
<td>Naiga, H.</td>
<td>49</td>
<td>NSIEWE, N.</td>
<td>175</td>
</tr>
<tr>
<td>Nair, A.</td>
<td>68</td>
<td>Nsuka, M.</td>
<td>163</td>
</tr>
<tr>
<td>Nairenge, R.</td>
<td>190</td>
<td>Ntaganira, J.</td>
<td>52, 94</td>
</tr>
<tr>
<td>Nakafeero, M.</td>
<td>98</td>
<td>Ntono, V.</td>
<td>120, 160, 181</td>
</tr>
<tr>
<td>Nakashidze, N.</td>
<td>136</td>
<td>Numeroere, T.</td>
<td>215</td>
</tr>
<tr>
<td>Nakiire, L.</td>
<td>160</td>
<td>Nurjanna, N.</td>
<td>4</td>
</tr>
<tr>
<td>Nanduri, S.</td>
<td>95</td>
<td>Nuvey, F.</td>
<td>176</td>
</tr>
<tr>
<td>Nanzalauka, F.</td>
<td>159</td>
<td>Nuwaha, F.</td>
<td>148</td>
</tr>
<tr>
<td>Nanzalauka, F.</td>
<td>5</td>
<td>Nuwamatsiko, R.</td>
<td>98</td>
</tr>
<tr>
<td>Nanziri, C.</td>
<td>160</td>
<td>Nwaha Nwaha, M.</td>
<td>56</td>
</tr>
<tr>
<td>Nasir, M.</td>
<td>6, 177</td>
<td>Nwankwo, L.</td>
<td>164</td>
</tr>
<tr>
<td>Nassar, A.</td>
<td>10</td>
<td>Nwokoro, U.</td>
<td>164</td>
</tr>
<tr>
<td>Nayak, P.</td>
<td>173</td>
<td>Nyabereka, R.</td>
<td>64</td>
</tr>
<tr>
<td>Ndjengwa, R.</td>
<td>24</td>
<td>Nyakarahuka, L.</td>
<td>32</td>
</tr>
<tr>
<td>Ndlovu, N.</td>
<td>92</td>
<td>Nyanga, A.</td>
<td>7, 150</td>
</tr>
<tr>
<td>Ndumu, D.</td>
<td>86, 120</td>
<td>Nyarko, K.</td>
<td>24, 134, 182, 190</td>
</tr>
<tr>
<td>Negesse, A.</td>
<td>109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEJMI, H.</td>
<td>151, 180</td>
<td>Obi, I.</td>
<td>164</td>
</tr>
<tr>
<td>Nelson, N.</td>
<td>186</td>
<td>Obonyo, M.</td>
<td>47, 183</td>
</tr>
<tr>
<td>Ngabirano, T.</td>
<td>58</td>
<td>Ocom, F.</td>
<td>160</td>
</tr>
<tr>
<td>Ngare, B.</td>
<td>47</td>
<td>Odongo, W.</td>
<td>95</td>
</tr>
<tr>
<td>Ngasala, B.</td>
<td>168</td>
<td>Ofori, O.</td>
<td>107</td>
</tr>
<tr>
<td>NGEGBAI, A.</td>
<td>119</td>
<td>Ogbonna, U.</td>
<td>114, 119</td>
</tr>
<tr>
<td>Ngenokesho, P.</td>
<td>24</td>
<td>Ogundimu, A.</td>
<td>95</td>
</tr>
<tr>
<td>NGO SACK, F.</td>
<td>221</td>
<td>Ogura, T.</td>
<td>196</td>
</tr>
<tr>
<td>Ngona Mandro, C.</td>
<td>17</td>
<td>Ogutu, J.</td>
<td>20, 22</td>
</tr>
<tr>
<td>NGONO NOAH, D.</td>
<td>221</td>
<td>Ojo, J.</td>
<td>81</td>
</tr>
<tr>
<td>Nguku, P.</td>
<td>12, 34, 59, 102, 149, 194, 212</td>
<td>Okeafor, I.</td>
<td>215</td>
</tr>
<tr>
<td>Nichols, J.</td>
<td>95</td>
<td>Okeke, L.</td>
<td>59</td>
</tr>
<tr>
<td>Nicolas, M.</td>
<td>37, 161</td>
<td>Okenwa, U.</td>
<td>212</td>
</tr>
<tr>
<td>Nimi, T.</td>
<td>189</td>
<td>Okolocha, E.</td>
<td>33</td>
</tr>
<tr>
<td>Niragire, E.</td>
<td>52</td>
<td>Okunromade, O.</td>
<td>207</td>
</tr>
<tr>
<td>Nishioka, M.</td>
<td>196</td>
<td>Okure, G.</td>
<td>114, 119</td>
</tr>
<tr>
<td>Name</td>
<td>Page</td>
<td>Name</td>
<td>Page</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>-----------------------</td>
<td>------</td>
</tr>
<tr>
<td>Ola, J.</td>
<td>38</td>
<td>Phimsin, B.</td>
<td>124</td>
</tr>
<tr>
<td>Olajide, L.</td>
<td>227</td>
<td>Pillin, H.</td>
<td>214</td>
</tr>
<tr>
<td>Olayinka, A.</td>
<td>59</td>
<td>Pimentel, R.</td>
<td>226</td>
</tr>
<tr>
<td>Olorukooba, A.</td>
<td>164</td>
<td>Pinto, R.</td>
<td>53</td>
</tr>
<tr>
<td>OMBAKU, K.</td>
<td>128</td>
<td>Pires, J.</td>
<td>51, 163, 189, 222</td>
</tr>
<tr>
<td>OMOLQ, J.</td>
<td>52</td>
<td>Pode, D.</td>
<td>163</td>
</tr>
<tr>
<td>Onyango, P.</td>
<td>184</td>
<td>Polkinghorne, B.</td>
<td>26</td>
</tr>
<tr>
<td>Opare, D.</td>
<td>63</td>
<td>Portela, C.</td>
<td>67</td>
</tr>
<tr>
<td>Oporia, F.</td>
<td>98</td>
<td>Praekunatham, H.</td>
<td>216</td>
</tr>
<tr>
<td>Orach, C.</td>
<td>49</td>
<td>Prairie, J.</td>
<td>15</td>
</tr>
<tr>
<td>Ortega, E.</td>
<td>119</td>
<td>Prakash, M.</td>
<td>219</td>
</tr>
<tr>
<td>Othman, A.</td>
<td>105</td>
<td>Pramono, D.</td>
<td>154</td>
</tr>
<tr>
<td>Otieno, C.</td>
<td>183</td>
<td>Prasetyaningsih, E.</td>
<td>41</td>
</tr>
<tr>
<td>Otshudianjeka, J.</td>
<td>37, 161</td>
<td>Prosper, M.</td>
<td>128</td>
</tr>
<tr>
<td>Owiny, M.</td>
<td>22, 183, 187</td>
<td>Putra, R.</td>
<td>154</td>
</tr>
<tr>
<td>Oyugi, E.</td>
<td>20, 22, 82, 83, 116, 192</td>
<td>Qadri, M.</td>
<td>93</td>
</tr>
<tr>
<td>Ozawa, S.</td>
<td>31</td>
<td>Qin, Y.</td>
<td>209</td>
</tr>
<tr>
<td>OZGULER, Z.</td>
<td>205</td>
<td>Quispe, M.</td>
<td>13</td>
</tr>
<tr>
<td>P, G.</td>
<td>123</td>
<td>R, S.</td>
<td>123</td>
</tr>
<tr>
<td>Pacheco Garcia, O.</td>
<td>142</td>
<td>Raghavan, A.</td>
<td>18</td>
</tr>
<tr>
<td>Packer, S.</td>
<td>214</td>
<td>Raheem, M.</td>
<td>93</td>
</tr>
<tr>
<td>Paduang, S.</td>
<td>124</td>
<td>Ramaswamy, M.</td>
<td>186</td>
</tr>
<tr>
<td>Paichadze, N.</td>
<td>98</td>
<td>Rattanathumsakul, T.</td>
<td>216</td>
</tr>
<tr>
<td>Pambasange, M.</td>
<td>163</td>
<td>Ray, N.</td>
<td>68</td>
</tr>
<tr>
<td>Pan, C.</td>
<td>204</td>
<td>Rayment-Bishop, T.</td>
<td>214</td>
</tr>
<tr>
<td>Pan, S.</td>
<td>39</td>
<td>Recoder, M.</td>
<td>129</td>
</tr>
<tr>
<td>Pang, F.</td>
<td>209</td>
<td>Reed, C.</td>
<td>83</td>
</tr>
<tr>
<td>Patel, M.</td>
<td>69</td>
<td>Reese, H.</td>
<td>19, 95</td>
</tr>
<tr>
<td>Patil, A.</td>
<td>42</td>
<td>Regessa, F.</td>
<td>177</td>
</tr>
<tr>
<td>Pattabi, K.</td>
<td>123</td>
<td>Reis, M.</td>
<td>69</td>
</tr>
<tr>
<td>Paula Júnior, F.</td>
<td>53</td>
<td>Renjith, A.</td>
<td>153</td>
</tr>
<tr>
<td>Paula, O.</td>
<td>53</td>
<td>Reynolds, A.</td>
<td>224</td>
</tr>
<tr>
<td>Pebody, R.</td>
<td>214</td>
<td>RGUIG, A.</td>
<td>151, 180</td>
</tr>
<tr>
<td>PEHLIVANTÜRK, G.</td>
<td>158</td>
<td>ribeiro, c.</td>
<td>67</td>
</tr>
<tr>
<td>Peng, J.</td>
<td>43</td>
<td>Ribeiro, I.</td>
<td>67</td>
</tr>
<tr>
<td>Peng, Z.</td>
<td>209</td>
<td>Rodriguez, M.</td>
<td>129</td>
</tr>
<tr>
<td>Pennini, V.</td>
<td>129</td>
<td>Rojas, R.</td>
<td>226</td>
</tr>
<tr>
<td>Percio, J.</td>
<td>67</td>
<td>Romero, K.</td>
<td>226</td>
</tr>
<tr>
<td>Perez, L.</td>
<td>112</td>
<td>Ropa, B.</td>
<td>11</td>
</tr>
<tr>
<td>Permatasari, I.</td>
<td>4</td>
<td>Rotich, R.</td>
<td>83</td>
</tr>
<tr>
<td>Pham Tho, D.</td>
<td>211</td>
<td>Rugema, L.</td>
<td>52</td>
</tr>
<tr>
<td>Phan Thi Le, Q.</td>
<td>211</td>
<td>Ruksachat, N.</td>
<td>124</td>
</tr>
<tr>
<td>Phan Thi Thanh Thao, T.</td>
<td>211</td>
<td>Rusisiro, B.</td>
<td>94</td>
</tr>
<tr>
<td>Name</td>
<td>Page</td>
<td>Name</td>
<td>Page</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-------</td>
<td>---------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Rusli, R.</td>
<td>46</td>
<td>Sheriff, M.</td>
<td>119</td>
</tr>
<tr>
<td>Ruto, G.</td>
<td>184</td>
<td>SHEY NSAGHA, D.</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shikesho, R.</td>
<td>182</td>
</tr>
<tr>
<td>Saad, H.</td>
<td>108</td>
<td>Shimoo, T.</td>
<td>196</td>
</tr>
<tr>
<td>Saavedra-Iturralde, M.</td>
<td>36, 169</td>
<td>Shiraku, E.</td>
<td>47</td>
</tr>
<tr>
<td>Sabitu, K.</td>
<td>164</td>
<td>Shirpoor, A.</td>
<td>208</td>
</tr>
<tr>
<td>Sabrina Flora, M.</td>
<td>173</td>
<td>Shoemaker, T.</td>
<td>32</td>
</tr>
<tr>
<td>sabur, a.</td>
<td>2</td>
<td>Silva, A.</td>
<td>67</td>
</tr>
<tr>
<td>Sackey, S.</td>
<td>63, 91</td>
<td>Silva, B.</td>
<td>51</td>
</tr>
<tr>
<td>Sadanandan, R.</td>
<td>18</td>
<td>Silva, D.</td>
<td>53</td>
</tr>
<tr>
<td>Sadauki, A.</td>
<td>207</td>
<td>Silva, I.</td>
<td>67</td>
</tr>
<tr>
<td>SADEUH, S.</td>
<td>88</td>
<td>Singh, S.</td>
<td>42, 68</td>
</tr>
<tr>
<td>Sainey BF, C.</td>
<td>141</td>
<td>Sithole, Z.</td>
<td>217</td>
</tr>
<tr>
<td>SALOU, M.</td>
<td>140</td>
<td>Skoff, T.</td>
<td>19</td>
</tr>
<tr>
<td>Sambou, S.</td>
<td>141</td>
<td>Smith, G.</td>
<td>214</td>
</tr>
<tr>
<td>Samwel, A.</td>
<td>101</td>
<td>Smith, K.</td>
<td>152</td>
</tr>
<tr>
<td>Sannneh, B.</td>
<td>141</td>
<td>Snowball, M.</td>
<td>186</td>
</tr>
<tr>
<td>Santos, E.</td>
<td>53</td>
<td>Soke, N.</td>
<td>224</td>
</tr>
<tr>
<td>Sarita, R.</td>
<td>18</td>
<td>Solomon, H.</td>
<td>6</td>
</tr>
<tr>
<td>Sariwongchan, R.</td>
<td>124</td>
<td>Solomon, S.</td>
<td>6</td>
</tr>
<tr>
<td>SASI KUMAR, H.</td>
<td>123</td>
<td>Soriano, A.</td>
<td>214</td>
</tr>
<tr>
<td>Satapathy, A.</td>
<td>18</td>
<td>Sow, K.</td>
<td>161</td>
</tr>
<tr>
<td>Sathasivam, J.</td>
<td>76</td>
<td>Spradling, P.</td>
<td>186</td>
</tr>
<tr>
<td>Schaumleffel, L.</td>
<td>204</td>
<td>Ssebagereka, A.</td>
<td>31</td>
</tr>
<tr>
<td>Schertzer, A.</td>
<td>155</td>
<td>Ssendagire, S.</td>
<td>148, 184</td>
</tr>
<tr>
<td>Schieve, L.</td>
<td>224</td>
<td>Ssennyonjo, A.</td>
<td>148</td>
</tr>
<tr>
<td>Schultz-Lewis, DVM, MPVm, L.</td>
<td>204</td>
<td>Stone, N.</td>
<td>95</td>
</tr>
<tr>
<td>Sembuche, S.</td>
<td>7, 77, 131, 150, 156</td>
<td>Strella, T.</td>
<td>129</td>
</tr>
<tr>
<td>Sena, L.</td>
<td>188</td>
<td>Su, C.</td>
<td>48</td>
</tr>
<tr>
<td>Sengu, N.</td>
<td>119</td>
<td>Sucaldito, M.</td>
<td>36, 38, 65, 89, 166, 169</td>
</tr>
<tr>
<td>Serech, H.</td>
<td>187</td>
<td>Sufyan, M.</td>
<td>12</td>
</tr>
<tr>
<td>Serrat, V.</td>
<td>129</td>
<td>Sugerman, D.</td>
<td>6, 177</td>
</tr>
<tr>
<td>Sesay, M.</td>
<td>119</td>
<td>Sugiarto, S.</td>
<td>4</td>
</tr>
<tr>
<td>SEZEROL, M.</td>
<td>205</td>
<td>Sugunan, A.</td>
<td>123</td>
</tr>
<tr>
<td>Shabani, H.</td>
<td>101</td>
<td>Sulaiman, S.</td>
<td>62</td>
</tr>
<tr>
<td>Shabeyanga, R.</td>
<td>64</td>
<td>Sumbal, N.</td>
<td>29</td>
</tr>
<tr>
<td>Shadfan, B.</td>
<td>125</td>
<td>Sun, J.</td>
<td>43</td>
</tr>
<tr>
<td>Shambira, G.</td>
<td>64, 92, 100, 195, 217</td>
<td>Sunagawa, T.</td>
<td>196</td>
</tr>
<tr>
<td>Shang, N.</td>
<td>19</td>
<td>Sundaramoorthy, L.</td>
<td>139</td>
</tr>
<tr>
<td>Shariff, M.</td>
<td>47</td>
<td>Susilaningsih, T.</td>
<td>4</td>
</tr>
<tr>
<td>Shaweno, T.</td>
<td>188</td>
<td>Suzuki, M.</td>
<td>196</td>
</tr>
<tr>
<td>Shen, T.</td>
<td>40</td>
<td>Svanidze, S.</td>
<td>136</td>
</tr>
<tr>
<td>Sheriff, A.</td>
<td>119</td>
<td>Syarif, S.</td>
<td>46</td>
</tr>
<tr>
<td>Name</td>
<td>Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syed Shaikh, S.</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T P, V.</td>
<td>42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachie-Menson, A.</td>
<td>107</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taddege, T.</td>
<td>109</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Takeda, A.</td>
<td>196</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Talib, H.</td>
<td>62, 76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tan, y.</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tantirat, P.</td>
<td>216</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanwar, S.</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tao, Z.</td>
<td>74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tarimo, D.</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariq, M.</td>
<td>106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tasie, A.</td>
<td>177</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tatenda, Y.</td>
<td>31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taylor, J.</td>
<td>152</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tazi, M.</td>
<td>60, 146, 180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temel, F.</td>
<td>158, 205</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temu, S.</td>
<td>87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thakur, V.</td>
<td>139</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thangarajah, D.</td>
<td>110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thao, M.</td>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thompson, R.</td>
<td>214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tian, L.</td>
<td>224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Todkill, D.</td>
<td>214</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOPAL, S.</td>
<td>158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torbosh, A.</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Torres, M.</td>
<td>129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tran Thi Hoang, O.</td>
<td>211</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trevenar, S.</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tshimanga, M.</td>
<td>64, 92, 100, 195, 217</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuhebwe, D.</td>
<td>45, 184</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tukur, D.</td>
<td>12, 103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tumusiime, A.</td>
<td>32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuo, X.</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tusiime, P.</td>
<td>160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyakaray, V.</td>
<td>194</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ujang, N.</td>
<td>62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukponu, W.</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Umeokonkwo, C.</td>
<td>103</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urio, L.</td>
<td>7, 87</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usman, R.</td>
<td>164</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Valenzuela, E.</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van Beneden, C.</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vandi, M.</td>
<td>114, 119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Velmurugan, G.</td>
<td>219</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victorino, D.</td>
<td>222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vontas, J.</td>
<td>165</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vugia, D.</td>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wang, H.</td>
<td>39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wang, L.</td>
<td>25, 145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wang, S.</td>
<td>178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wansau, Z.</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Waziri, H.</td>
<td>207</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wengenack, N.</td>
<td>152</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whitehouse, E.</td>
<td>119</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whittaker, H.</td>
<td>204</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiarlyanti, W.</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wibowo, T.</td>
<td>41</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wichaidit, W.</td>
<td>124</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wiggins, L.</td>
<td>224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wilson, K.</td>
<td>77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windham, G.</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wondimu, J.</td>
<td>6, 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wong, A.</td>
<td>167</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wong, L.</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wu, P.</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wubshet, M.</td>
<td>147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wullar, O.</td>
<td>84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xavier, A.</td>
<td>53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xia, Y.</td>
<td>143, 145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xu, D.</td>
<td>178</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xu, Q.</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xu, Z.</td>
<td>126</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yadav, R.</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yan, H.</td>
<td>145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yang, J.</td>
<td>48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yang, R.</td>
<td>74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yao, J.</td>
<td>209</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yasin, M.</td>
<td>115</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yañez Trujillano, H.</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name</td>
<td>Page(s)</td>
<td>Page(s)</td>
<td>Page(s)</td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>Yellman, M.</td>
<td>192</td>
<td></td>
<td>74, 178, 201</td>
</tr>
<tr>
<td>Yesuf, A.</td>
<td>147</td>
<td></td>
<td>39, 43</td>
</tr>
<tr>
<td>Yilmaz Nemli, H.</td>
<td>158</td>
<td></td>
<td>209</td>
</tr>
<tr>
<td>Yondu, S.</td>
<td>150</td>
<td></td>
<td>40, 74, 143, 145, 209, 223</td>
</tr>
<tr>
<td>YOUBI, M.</td>
<td>96, 121, 180</td>
<td></td>
<td>171</td>
</tr>
<tr>
<td>Yu, Y.</td>
<td>74</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>YUSUF, O.</td>
<td>149</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>Zailani, M.</td>
<td>62</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Zemei, D.</td>
<td>135</td>
<td></td>
<td>86, 120</td>
</tr>
<tr>
<td>Zerriouh, F.</td>
<td>50</td>
<td></td>
<td>69</td>
</tr>
<tr>
<td>Zhang, G.</td>
<td>74</td>
<td></td>
<td>44, 223</td>
</tr>
<tr>
<td>zhang, G.</td>
<td>201</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Zhang, J.</td>
<td>209</td>
<td></td>
<td>79</td>
</tr>
<tr>
<td>Zhu, B.</td>
<td></td>
<td></td>
<td>86, 120</td>
</tr>
<tr>
<td>Zerriouh, F.</td>
<td></td>
<td></td>
<td>69</td>
</tr>
<tr>
<td>Zhu, B.</td>
<td></td>
<td></td>
<td>86, 120</td>
</tr>
<tr>
<td>Zhou, X.</td>
<td></td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Zulu, D.</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Zuma, K.</td>
<td></td>
<td></td>
<td>79</td>
</tr>
</tbody>
</table>