2nd

AFRICAN CONFERENCE

ON EMERGING INFECTIOUS DISEASES AND BIOSECURITY 2016

ABSTRACT BOOK

27TH-29TH, JULY, 2016
EKO-HOTEL, LAGOS, NIGERIA

27th-29th, July, 2016
Eko-hotel, Lagos, Nigeria

2nd African Conference On Emerging Infectious Diseases And Biosecurity 2016

Organizers: Lagos State Government (Ministry of Health), The Conference Advisory Panel GET Consortium, Mothergold (MG), West African Taskforce for the Control of Emerging and Re-emerging Infectious Diseases (WATER) The Pan-African Network for the Popularization of Science & Technology and Science Communication. (AFRICAN GONG)

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WELCOME MESSAGE FROM THE HONOURABLE COMMISSIONER FOR HEALTH, LAGOS STATE, DR. JIDE IDRIS, ON THE 2ND AFRICAN CONFERENCE ON EMERGING INFECTIOUS DISEASES AND BIO-SECURITY TO BE HELD IN EKO HOTEL AND SUITES, VICTORIA ISLAND, LAGOS, NIGERIA FROM 27TH TO 29TH JULY, 2016, HELD ON 21ST JULY, 2016.

The Lagos State Government in collaboration with Global Emerging Pathogens Treatment Consortium (GET), the West African Task Force for Emerging and Re-Emerging Infectious Disease Outbreaks (WATER), African Gong and the Global Partnership Programme (GPP), Canada is organising a 3-day "Second African Conference on Emerging Infectious Diseases and Bio-Security" in Lagos from the 27th to the 29th of July, 2016.

The theme of the Conference is "STRENGTHENING AFRICAN HEALTH SYSTEMS- BUILDING RESILIENCE AND CAPACITY TO TACKLE EPIDEMIC THREATS: BIOSECURITY AND INFRASTRUCTURE IN THE AFTERMATH OF THE EBOLA OUTBREAK".

The conference has the following sub-themes:

1. Era of Emerging infectious Diseases (EID) and the aftermath of the Ebola outbreak.
2. Bio-Security and Bio-banking.
3. Public Learning and Understanding of Science (PLUS).
4. Forum to discuss an Ebola vaccine Strategy.

The first Conference, held on the 18th January, 2015, in Dakar, Senegal, was jointly organised by RARS (African Network for the Research on AIDS), GET (Global Emerging Pathogens Treatment Consortium), RESAPSI (African Network of Practitioners providing care for people living with HIV/AIDS) WATER (West African Task Force to combat Ebola, Emerging and Re-emerging threats) and the MSAS (Ministry of Health and Social Action of Senegal), to review the response to the 2014 EVD outbreak in the West African Sub-Region, evaluate potential EVD treatment options, explore measures to expedite potential vaccine and treatment strategies and to emphasise the importance of African led initiatives against EVD.

Lagos State Ministry of Health, representatives of Health Ministries of Guinea, Liberia, Sierra Leone, the Republic of Mauritania, West African Health Organisation (WAHO), New Partnership for Africa's Development (NEPAD), Bill and Melinda Gates Foundation, World Health Organisation (WHO) and other bilateral and multilateral partners attended the Conference.

The overall aim of the first Ebola Virus Disease (EVD) Conference was to continually emphasize the key importance of the African response in combating Ebola, advocating various treatment strategies and preparedness against future outbreaks.

The specific objectives of the African Voice and Leadership Conference on Ebola are:

I. Accelerating the evaluation of treatments and potential vaccines against Ebola.

ii. Facilitating the collection and assessment of plasma, and other blood products of Ebola convalescent patients as a means of potential treatment for people infected with the EVD virus.

iii. Reinforcing the leadership of Africa scientists in the fight against Ebola and other emergent highly pathogenic viral haemorrhagic infections, such as Lassa Fever and Dengue Fever.

iv. Strengthening genuine community engagement in the response against the outbreak, including research efforts.

Some recommendations from the Dakar conference include:

I. To encourage policymakers, African scientists and the communities to show leadership in the fight against the current outbreak for an emphasis on an African regional vision regarding discussion, policy making, and the research and treatment actions in response to the epidemics.

ii. To promote the support to African governments and the engagement in the production of Hyper-immune globulin to speed up the evaluation of the treatments and vaccines against the Ebola virus and other deadly diseases.

iii. Promote the strong and effective support for policymakers and various stakeholders to develop the capacities of African scientists and strengthen the capacity of health, research, and governance bodies in the sub-region in the area of biosecurity, biobanking and bioethics of public health crises scenarios.

At the end of the first conference, it was resolved that:

I. The Conference should hold YEARLY.

ii. The next Conference should be held in Nigeria and hosted by the Lagos State Government in recognition of its leading role in the rapid containment of EVD in the country and because the first conference was initially scheduled to hold in the State before it was deferred to one of the neighbouring countries around the epicentres of the EVD outbreak.

iii. The resolutions of the Dakar conference would be ratified during the Lagos conference.

I need to remind all that Ebola virus disease and other highly pathogenic emerging and re-emerging epidemic prone diseases remain threats to the West African Sub-Region and all hands must be on deck prevent and control their epidemics.

You may recall that Twenty Eight Thousand, Six Hundred and Forty Five (28,645) people were infected during the last Ebola Disease (EVD) outbreak in six (6) countries in the West African sub-Region, out of who Eleven Thousand, Three Hundred and Twenty Four (11,324) died, representing 39.5% Case Fatality Rate (WHO/CDC, April 2016). All deaths from the epidemic, except 14, occurred in Liberia, Sierra Leone and Guinea. Liberia was worst hit with 4,810 deaths. Nigeria recorded 8 deaths, while Mali recorded 6 deaths. All the affected countries have however been declared Ebola free.

Also, Lassa Fever outbreak occurred in Nigeria between November 2015 and March 2016, in Twenty one (21) States of the federation, including Lagos State. The total laboratory confirmed cases were 80, out of which 50 persons died, representing 62.5% case Fatality Rate.

We also need to remind ourselves that about three weeks ago, 3 cases of Zika virus infection were diagnosed in Guinea Bisau. Nigeria also recorded a case of Dengue Fever a few weeks ago.

I have highlighted these to underscore the need for the West African Sub-Region to be on full alert and strengthen our disease Surveillance mechanism and scale up our emergency preparedness and response platforms.
The second International Conference will hold for three days, from 27th to 29th of July, 2016, at the Eko Hotel and Suites. The conference is being organised to consolidate the gains of the first conference, review the status of implementation of the resolutions, chart the way forward for prevention and control of Emerging and Re-emerging Infectious Diseases and bring the issue of Bio-security to the front burner. It is intended to help develop the continents own strategic intervention and response mechanisms to increasing outbreak of Emerging Infectious Disease (EID) and biological terrorism threats. These home-grown responses will be aligned with the evolving Global Health Security Agenda (GHSA) and the "One Health" paradigms envisioned by World Health Organisation (WHO), International Animal Health (OIE) and Food and Agriculture organisation (FAO). Topics such as Global Bio-security,

Leadership and Governance, Research on potential treatment for deadly infectious diseases, Bioethics, Bio-banking, Strengthening health systems and Infection control will also be deliberated on.

The conference will also address the sub-optimal of infrastructure and technical capacity for an indigenous response to contain biological threats from highly infectious pathogens, with the aim of abating almost complete dependence on the developed world for effective response. In addition, the conference will create an opportunity for the continent to derive biotechnological sustainability capacity and knowledge, bringing together diverse participants from across the world and Africa in particular.

The participants at the conference will include policy makers, scientists, health care professionals, emerging diseases survivors (especially Ebola survivors), development partners and Community opinion leaders.

The Governor of Lagos State, Mr. Akinwunmi Ambode, is totally committed to improving the health status of Lagosians and welcomes great ideas, innovations, creativity, strategic initiatives and investments that will engender effective and efficient prevention and control of diseases in the State with the ultimate aim of enhancing human capital development, increasing productivity and adding quality life to the years of the good people of Lagos State.

I wish to assure all international and local facilitators and participants that the security of lives in the State is paramount and we would like to express the appreciation of the Lagos State Government to Global Emerging Pathogens Treatment Consortium (GET) for taking the lead in initiating this conference in partnership with the West African Task Force for Emerging and Re-emerging Infectious Disease outbreaks (WATER), African Gong and Global Partnership Programme (GPP) Canada, the Local Organising Committee (LOC), Mothergold Consulting, Janssen Pharmaceutical, Glaxo Smith Kline (GSK) and the University of Maryland, Baltimore, USA, for collaborating with Lagos State Government in hosting this conference.

Distinguished delegates, please enjoy the warm hospitality of Lagos State indigens and Nigerians as a whole as you meet to deliberate on how to improve awareness and capacity in Nigeria and Africa as a whole.

We as a global community can only be as strong as the weakest link and any dangerous pathogen is only one flight away. These are the realities.
Itesiwaju Ipinle Eko lo je wa logun!

Dr Jide Idris
Honorable Commissioner (Health)

WELCOME MESSAGE FROM THE GLOBAL EMERGING PATHOGENS TREATMENT CONSORTIUM (GET), ON THE 2ND AFRICAN CONFERENCE ON EMERGING INFECTIOUS DISEASES AND BIO-SECURITY TO BE HELD IN EKO HOTEL AND SUITES, VICTORIA ISLAND, LAGOS, NIGERIA FROM 27TH TO 29TH JULY, 2016, HELD ON 21ST JULY, 2016.

Global Emerging Pathogens Treatment Consortium (GET) would like to use this opportunity to warmly welcome all delegates, special guests and participants to this conference in Lagos, the Metropolis of Africa.

It is critically important that Africa hosts its own indigenous meetings addressing response mechanism to biological threats and increasing incidences of Emerging Infectious Diseases (EID) from an African perspective and align these with the evolving Global Partnership Program (GPP), Global Health Security Agenda (GHSA) and the "One Health" paradigms developed by the WHO, OIE and FAO and more recently the global security agencies. As academics and civil society we are supporting all efforts by United Nations, WHO, AFRO, the African Union Peace and Security Department to realize universalization of international conventions and treaties that ensure non-proliferation of dangerous biological agents and toxins.

At the first Africa Conference of EID and EBOLA organized by a GET-WATER collaboration on the 18th January 2015 in Dakar, the DAKAR DECLARATION and Resolutions were developed. Essentially the Declaration outlined the severe lack of infrastructure and technical capacity for an indigenous response mechanism, which explains our almost complete dependence on the developed world and the loss of the opportunity to address our own issues, gain experience and derive biotechnological capacity, knowledge and intellectual property.

This follow up meeting in Lagos will revisit the Declaration and focus on the deficiencies outlined in the Declaration which are Biobanking, Vaccine Development, Biosafety and Biosecurity and the public learning and understanding of science. Embedded in all this are the key tenants of Bio-Ethics and Community Engagement that were handled in such a deplorable and atrocious manner during the Ebola outbreak, and continues till today.

The concept is as follows:

1. Align the theme of this conference with the concept of the GHSA /GPP and One Health philosophies.
2. Focus on West Africa with lesser representation from all African regions.
3. Attract the key people from the ECOWAS countries involved with policy issues in the following sectors: human health, animal health, security, agriculture, curriculum development in Medicine and Veterinary Schools, biosafety containment facilities and biobanking.
4. Promote the understanding of the Biological Weapons Convention (BWC) and the United Nations Security Resolution 1540 which focus on global restraints on proliferation of dangerous biological agents and State capacity and accountability.

General Objective of the Conference:

To accelerate regional and continental political and public awareness of biological threats and align with international efforts to address such events such as the IHR, PVS, the One Health Paradigm, BWC and UNSCR 1540. Provide the impetus for adaptation of policies and practices that will minimize the evolution of EID and the spill over of zoonotic diseases from animals to human populations.

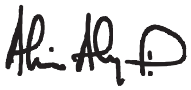
Focused Objectives:

1) Share experiences, best practices, and challenges in addressing Zoonotic Disease in both the animal and human sectors.
2) Identify regional and international opportunities for collaboration in support of zoonotic disease prevention and control.
3) Identify activity going on the Continent and use information shared to develop milestones for achieving an African Agenda
4) Fast track a harmonised African Strategy to receive full Political backing

Intended outcomes:

1. Heightened awareness of Africa's deficiencies and what needs to be done to address them, essentially as pointed out in the Dakar Declaration.
2. Creating awareness of the BWC, UNSCR 1540, GHSA and GPP strategies, which are currently not well known or understood.
3. Moving closer to an Endorsement of the Dakar Declaration
4. Fast tracking a regional and continental strategy to address EID and the reduction of opportunities for biological threats on the Continent.
5. Ensuring ongoing discussion and dialogue thereby promoting the opportunity for high-level advocacy and ownership of an African Agenda for the Continent.

Akin Abayomi



Akin Abayomi
Principal Investigator
On behalf of Global Emerging Pathogens Treatment Consortium (GET)

Sina Fagbenro-Byron
Co-Chair of Local Organising Committee

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Klement Jaidzeka
Piers Millet
Rebecca Katz
Dr. Elizabeth Rasekoala
Prof. Godfrey Tangwa
Prof Charles Wiysonge
Dr Toritse Orubu

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- Jide Idris
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- Prof Ayoade Oduola
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- Serge Eholie
- Raad Fadaak
- Jean Nachega
- John Dye
- Prof Omilabu
- Henry Berrian
- Sahr Gevao
- Oumou Maiga
- Gbemisola Akosa
- Francis Kombe
- Gustavo Palacios
- Stephen Kennedy
- Prof Nasidi

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- Olga Semakula
- Kwadwo Koram
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- Trevor Smith
- Ken Ugwu
- David Jones
- Rebecca Hoile
- Tianna Brand
- Oyewale Tomori
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- Kadiatou Dao
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- Gary Kobinger
- Oyewale Tomori
- Ripley Ballou
- Swapti Gupta
- Oyekanmi Nash
- Paul Hodgson
- Wilson Mok
- Dr Mohamed Samai

THE CONFERENCE ADVISORY PANEL (CAP)

Members of the Panel are as follows:

Professor Diran Makinde. Chair, GET advisory board/ Director, NEPAD Agency South Africa
Professor Suleiman Mboup. Executive Director, WATER. Dakar, Senegal
Professor Angela Chukwu. University of Ibadan
Professor Innocent Ujah. Nigerian Institute of Medical Research.
Professor Kwado Koram. Director, Noguchi, Accra, Ghana.
Professor Ayoade Oduola. Director, University of Ibadan Research Foundation, Nigeria.
Professor Iqbal Parker. Director ICGEB, UCT, Cape Town, South Africa.
Professor Akin Osibogun. Medical Director, LUTH, Lagos, Nigeria.
Dr Obadiah Moyo. Zimbabwe Ministry of Health. Harare, Zimbabwe.
Professor S. Omilabu. Professor of Virology, LUTH, Nigeria

Emerging Infectious Diseases & Ebola Faculty

Welcome Message

The Emerging Infectious Diseases & Ebola (EID & Ebola) Faculty of this Conference has been set up closely examine EIDs as an accelerating phenomenon and the aftermath of the Ebola outbreak, with focus on:

- New EID trends such as Lassa, Zika, MERs, SARS and Pandemic Influenza,
- Plasma and Plasmapheresis agenda for West Africa,
- Survivors and Survivor welfare
- Clinical trials

As the nominal faculty for the conference we are keen to lead discussions and engagement with all the experts at this conference, on ways address humanitarian and health crises, biological and environmental threats arising from emerging and re-emerging highly infectious pathogens through research, logistic and technological capacity building across Africa.

Emerging Infectious Diseases (EIDs) arising in Africa, and other parts of the world do not respect international borders and can cross long distances naturally or by man's increasing rapid global interconnectivity. This means that an EID may arise in Africa or anywhere else in the world and affect any population.

These include refers both natural infections usually arising from bugs emerging from the animal kingdom to affect humans and now with technological advancement can also include man made or artificially altered pathogens or bugs that have the potential to cause human disease and disequilibrium in the ecosystem. Emerging Pathogens can also include neglected historical infectious diseases such as river blindness, bilharzias, guinea worm and sleeping sickness as examples, which should not be relegated from focus due to emergence of new exotic pathogens.

We are looking forward to using this convergence of diverse expertise, including public opinion indigenous knowledge systems, necessary to collectively provide the best possible culturally sensitive response to a biological threat and public health emergency as fast as possible.

On behalf of the conveners and the program development and organizing team, we wish to welcome you all to Lagos, and to the 2nd African Conference on EID and Biosecurity. We trust that you will have many opportunities over the next three days to share and learn from colleagues attending this seminal conference.

Dr. John Amuasi, Emerging Infectious Diseases & Ebola Faculty Chair.
Klement Jaidzeka, Emerging Infectious Diseases & Ebola Faculty Co-Chair.

Author: Kambiz Shekdar

Title: Critical pitfalls and considerations for the viability of a stem cell cure for AIDS in Africa and throughout the world.

In 2007, naturally-occurring HIV-resistant stem cells were used to cure AIDS. This case illuminates several technological and scientific paths that are being pursued to develop a routine and broadly applicable cure. In addition to science and technology, the prospect of a stem cell cure raises important ethical, social and economic questions that must be addressed if it is to be viable.

Is the cure a priority or reality for Africa? With its heavy burden of AIDS, when much of Africa does not yet even share adequate access to lifesaving anti-retroviral drugs, is the prospect of any such sophisticated stem cell cure indeed at all viable? Is there potential and facility for moderate low dose stem cell transplants across the continent and if yes, what capacity is required? What are the GMO issues, long-term consequences and additional social and ethical issues? What kind of scientific and social ethical issues are raised? How will the cure be paid for in cases where resources are severely limited? What kind of community engagement is required? Can a stem cell cure be scalable and made available for all those in need, regardless of ability to pay? What is the economic benefit or opportunity cost and how does a cure fit together with anti-retroviral drug therapy? How would a cure change the equation from controlling the epidemic to ending AIDS worldwide? The scientific prospect of a cure for AIDS is, indeed, on the table; but beyond science, it is how responsibly and responsively we consider and address the glaring pitfalls and questions relating to the cure that will determine the long term success and viability of this possible new opportunity as a therapy for millions across the world and a global chance to end AIDS.

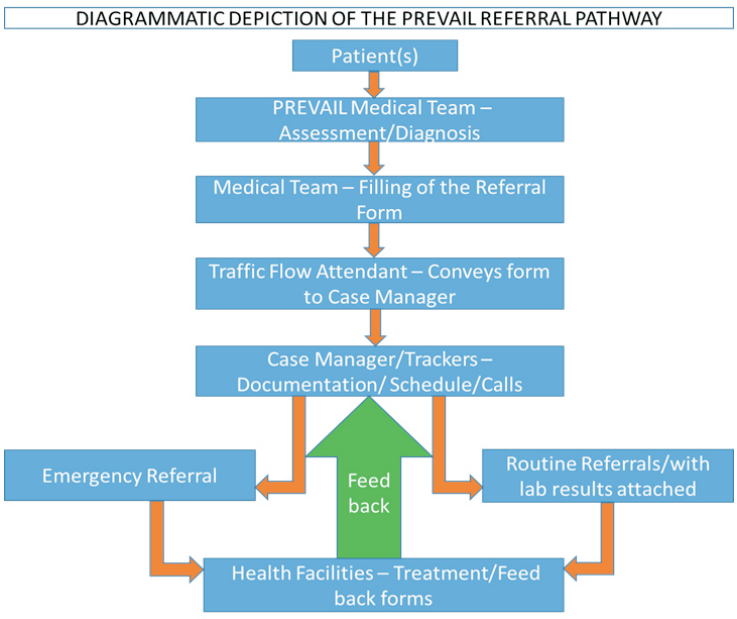
A MEDICAL CARE REFERRAL MODEL FOR RESEARCH PARTICIPANTS IN A RESOURCE-LIMITED SETTING: A STEP BY STEP GUIDE TO THE PREVAIL III REFERRAL SCHEME

Kokulo Franklin, Sr., Sienneh Tamba, Marnijina M. Shannon, Louvina T. Sumbo, Nannie M. Kenyen, Robert Kpoto, Moses Badio.
Partnership for Research on Ebola Virus in Liberia (PREVAIL)

Introduction: The ongoing PREVAIL Ebola Natural History Study in Liberia seeks to identify sequelae of Ebola virus disease (EVD) in survivors, determine the persistence of Ebola virus in body fluids, and assess whether survivors can transmit EVD to their contacts. One major multifactorial challenge has been providing adequate clinical care to study participants. This paper describes a novel approach that could be considered as a model for providing clinical care for research study participants, especially in resource-limited settings.

Methodology/Discussion: This model has leveraged both PREVAIL and the Government of Liberia (GoL) in providing care for PREVAIL research study participants. The system includes a network of medical staff, case managers, participant trackers, and a coordinator that work as a team to coordinate care for the participants. Using this referral scheme, PREVAIL participants were screened for a wide range of diseases and referred to mainly government-run hospitals and other health centers. Attending physicians at these health centers screened and treated these participants, and then completed feedback forms, which were then retrieved by the case managers for proper documentation into a study tracker. During the period under review (June 2015 to April 2016), a total of about 1,789 participants (including survivors and their close contacts) were referred to major health facilities. Approximately 1, 244 (70 percent) of those referred received care.

Conclusion: This PREVAIL-GoL scheme represents a novel approach to providing clinical care for research participants in a post-Ebola research setting, and could be tested in similar resource-limited settings.



The Role of Mathematics in The Era of Emerging Infectious Diseases

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The role of mathematics modelling in studying the diseases transmission in an open population and its dynamics is studied. The mathematical modelling is used to analyse an S-E-I-R-S epidemic model to determine the points at which the system is free of any infectious disease and when the system is not free and also with the help of mathematical modelling the condition for the persistence of the disease in the system is set. Lyapunov function is used to determine the global stability of the disease free equilibrium.

The steady state points were obtained. The conditions for the endemic state were also determined. Effects of transmission rate and the treatment rate were also tested. The study revealed that the disease free equilibrium is locally and globally asymptotically stable if $R_0 < 1$ and unstable if $R_0 > 1$. The disease persists in the population if $R_0 > 1$. With the right intervention like treatment of infected individuals, the study also revealed that increase in the rate of treatment will reduce the burden of the disease on individuals and if the transmission rate is not checked, the study showed that the population is at a risk.

Socioeconomic Impact of Ebola epidemic in Guinea and Neighboring Countries- June 2016
Dr Alpha Mahmoud Barry

The Ebola virus disease (EVD) epidemic in Guinea, Liberia and Sierra Leone is the longest, largest, deadliest, and the most complex and challenging Ebola outbreak in history. It is unprecedented in terms of its duration, size of infections and fatality, and geographical spread. The outbreak subsequently spread to Liberia, Sierra Leone, Nigeria, Senegal, and Mali OMS. Unlike the past outbreaks, which were mostly restricted to remote areas, the West African case is complex; it is geographically widespread, involving small rural and large urban centers (including Conakry, Monrovia, and Freetown).

The multi-country outbreaks occurring simultaneously make this pandemic unique. Due to the high transmission rate and limited capacity to manage the epidemic at the outset, as of 7 January 2015, the fatality rate is also high, from 35.3 percent in Sierra Leone to 64.1 percent in Guinea, Its spread has been complicated by health workers becoming infected (830, of whom 488 died). The loose migratory pattern in the region, fear, ignorance and risky cultural practices make the containment of the epidemic challenging. In addition to spreading to several, Before the end of The Ebola Epidemic raise up some research questions like what can be the impact Ebola in Guinean, Sierra Leonean and Liberian's macro and micro economy, their community daily living from small business to the big import and export company. How deep was the culture, customer of the community was affected,

Objectives:
The specific objectives of this study were
- Determine the of Ebola epidemic in Guinea, Sierra Leone and Liberia;
- Describe the magnitude and dimension of Ebola outbreak in Guinea, Sierra Leonne and Liberia
- Assess the extent of the economic and social issues that make the containment of outbreak quite challenging and difficult to manage
- Describe the action taken to control the outbreak to control the outbreak;

Methods
A Data analysis and qualitative study was used combining complementary data collection methods of Guinea, Sierra Leone and Liberia, including
- A review documentary (Statistics, Study reports) related to the Ebola epidemic,
- An interview questionnaire targeting community deeply hit by the Epidemic
- In deep interviewed targeting stakeholders as well as the national and International organization's Managers.
- A triangulation to draw results from the above ethnics

Results
Unlike the past outbreaks, which lasted for a very short time, the West African case has lasted for more than one year – and has not yet fully abated.

- As of 11 February 2015, there were 22,859 EVD cases in total: 3,044 in Guinea, 8,881 in Liberia, and 10,934 in Sierra Leone – with a cumulative death of 9,162.
- The level of infection ranges 166 health workers in Guinea (fatality of 64%) to 37 in Liberia (fatality of 64%) and Sierra Leone (fatality of 35%)- the high incidence of death among health workers has led people to believe that the health center are the main source of Ebola infection
- The most active segment of population (15-44 years) affected (57% of the total population)
- The number of EVD cases is higher among women (53%) than men.
- The Ebola epidemic in Guinea 2707 infected (1709 dead) Sierra Leone 9446 infected (2758 dead) Liberia 8018 infected (3423 dead)
- One out four children affected by the EVD survived and most of the became orphan
- The total number of learning hours lost to school closure range from 486 in Guinea to 780 in Sierra Leone and 582 in Liberia. the closure of school exposed several children to child bused (including sexual exploitation and violence against young girl with a long term impact rom 2011 through 2016, the Ebola outbreak hit all aspects of economic and socio anthropologic including:

Socio anthropologic impact

The EVD has negatively affected Guinean social life, including attending ceremonies and public events; around 77percent of the respondents stated that their social lives had changed as a result of the fear of contracting Ebola through social gatherings.

- The psychosis, fear, and stigmatization spread all over communities causing panic and desolation;
- The trouble in communities' culture, trading us and custom everything has to be stopped or changed event the way the dead used to be buried;
- The international stigma against people from Guinea, Liberia and Sierra Leone almost all over the world
- The interdiction to the Muslims fiddles to go to Maka (Saudi Arabia for their hajj targeting from Guinea, Sierra Leone and Liberia is the most social impact of EVD
- The perceived fear caused resistance among the population that not only complicated containment measures, but also led to deaths of health workers. For instance, in September 2014, eight members of an anti-Ebola campaign team were assaulted and killed in Wome, a village near N'Zérékoré in Guinea. They were accused by villagers of spreading the EVD by spraying chlorine in infected communities

Macro-economic impact of the EVD

The government finance deficit is widening and repartee the public debt, The disease Ebol inflicts Heavy losses of income to households in Guinea, Sierra Leone, and Liberia.

- In general, the epidemic has impact the economy through three channels: direct, indirect and deferred indirect costs.

- The direct costs are mostly medical expenditures linked to the EVD at the macro level. Almost all big industry mining companies close up and the expatriate quite the areas living behind thousand family with fear, death, poverty without any revenue and expectation
- At the household level, the most direct cost is the use of family savings to take care of an EVD-infected family member.
- Indirect costs mainly consist in a reduction of productivity (or labor participation) for those who survived, or lack of productivity for those who did not survive.
- The deferred indirect cost is the cost that the household will have to pay in the absence of external aid.
- Children have not been able to attend school, and the long-term impacts will be devastating.

The macro-economic impacts for Guinea between 2014 and 2017 in terms of GDP per capita and GDP growth is important. In the high Ebola scenario (the current situation), the country will experience a 3.4-precent reduction in average GDP growth between 2014 and 2017 relative to the no Ebola scenario (or baseline). This reduction in GDP growth represents around US$155.9 million in lost GDP in 2015 for the low EVD case scenario and US$238.7 million for the high EVD scenario.

Food security impact

From 2013 trough 2016, the Ebola epidemic

- Impose an exponential increase in current expenditure at the expense of infrastructure spending and in the context of a low absorption capacity
- To avoid having Ebola in their Countries allmst all bordering Countries close or restricit the the population moved reducing food and others tools exportation affectig families with low incomes
- Reduce the purchasing power of the population and increases their vulnerability Reduce the impact of rising prices on people
- Income opportunities are reduced to nothing, especially in sectors oriented towards export

Conclusion and recommendation

Due to the political crisis and the disastrous economic policies over the years in Guinea, and the decade of civil war in Liberia and Sierra Leone, more than half of the populations of these countries live below the national poverty line. The Ebola epidemic outbreak has significantly affect the capacity of the countries to achieve their poverty reduction objectives. The available evidence indicates that the epidemic has affected production in strategic sectors such as agriculture and transportation, as well as the informal sector where employees are poorest.

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Knowledge of Ebola Virus Disease Prevention and its Intra-epidemic Practice Amongst Health Workers of a Tertiary Health Care Facility in North-Western Nigeria.

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Background: Ebola Virus Disease (EVD) is a highly contagious, life-threatening Viral Haemorrhagic fever that is characterized by haemorrhagic symptoms. A substantial number of healthcare personnel acquired EVD in the 2014 outbreak in West Africa . Health workers have 21 to 32 higher chances of contracting the disease compared to the general adult population . In Nigeria, 3 out of the first 4 casualties were Health care workers (two nurses and a doctor). The study was conducted to assess the knowledge and intra-epidemic practices regarding prevention of EVD amongst surviving health care workers of a tertiary healthcare facility in North-Western Nigeria.

Methodology: The study was a cross sectional descriptive study in which systematic sampling technique was used to select 150 respondents. Data analysis was done using IBM SPSS Statistics (version 21) software.

Results: Majority of the respondents (61%) had good knowledge of how to prevent EVD. However, 48% did not practice comprehensive prevention of EVD during the epidemic. There was a statistically significant association between profession of the respondents and their practice of prevention of EVD (p=0.0279).

Conclusion: The results indicated that there was low intra-epidemic EVD preventive practices despite a good knowledge of its prevention among most of the respondents. This wide gap between knowledge of EVD prevention and its practice depicts a problem in the Infection Prevention control (IPC) standard in the study facility and in the emergency preparedness of the health workers. For effective control of future outbreaks, there is need to adopt strategies that will improve intra-epidemic IPC practices among health workers.

Key Words:
Knowledge, Practices, Ebola Virus Disease, prevention, Health workers, Nigeria

Title: Managing public health crises in Africa: are we on the right path?

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Thematic Area:
2: Biosecurity and Biothreat Reduction: Biobanking, Bioinformatics, Biosafety, Biosecurity and Bioethics concerns in the aftermath of the largest Ebola outbreak known to man.

Preferred mode of presentation:
Oral Presentation

Generally in Africa, public health crises occurred often, and at some extent, on a regular basis. Although professionals do their best in dealing with each epidemic, the same epidemic can occur again and again in the same context (e.g.: Cholera, Ebola, Lassa, Meningitis, Malaria, etc.). The question is to know whether health professionals are using the best known approach to stop epidemics and tackle at the same time the root causes when dealing with the emergency situation of epidemics. It seems that when dealing with epidemics, health professionals in Africa prepare the next one to come in the same context.

According to Virchow (1848), "Every disease has two causes, the pathological and the other, political." Because of the leading model of health in the health systems in Africa, the biomedical one, we are assuming through this analysis that the "political cause" is merely addressed and that is why Africa is still facing epidemics, and more and more often. The situation is worsening due to increasing poverty in Africa which is not in the scope of work of the health systems but need necessarily to be considered when aiming to disease control.

We are using the recent West African Ebola outbreak to argue our thoughts.

Emergence of Multidrug Resistant Bacterial Pathogens as Public Health Threat: The Case in Ethiopia

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In developing countries every year 2.4 billion human infections with origins in animals (zoonotic) occur, causing widespread illness and 2.2 million human deaths. These diseases are often endemic and include brucellosis, tuberculosis, salmonellosis, leptospirosis, rabies, and others that are under diagnosed, underreported, and which disproportionately affect those who live nearest to animals. Moreover, these diseases invariably deepen poverty and destroy livelihoods. Developing countries like Ethiopia are challenged by health issues associated with a high incidence of neglected but endemic zoonoses whose control has been limited by a lack of integrated control measures, accounting for both animal and human populations. Moreover, the emergence of multidrug resistant pathogens causing these diseases magnify the extent of the problem and this is associated with the indiscriminate use of antibiotics in livestock production in developing countries. In Ethiopia, the major antibiotics used for treatment of animal and human diseases include penicillins, streptomycins, gentamycin, oxytetracycline and sulfa drugs. Pilot studies conducted in different corners of the country indicated that the majority of bacterial pathogens are developing resistances against the commonly used antibiotics. Mycobacterium spp., E.coli, Salmonella spp, Staphylococus aureus and Streprococcus spp. were the major bacteria that have developed multidrug resistance. The emergence of these antimicrobial resistance pathogens calls for an urgent response from responsible authorities. Therefore, the objective of this review is to highlight the emergence of multi-drug resistant bacterial pathogens and their associated public health risks.

Key words: Antibiotic, Bacteria, Multi-drug, Resistance, Zoonoses
Theme: Theme 2.d; Preferred mode of presentation: Oral but poster is also possible

The German Partnership Program for Excellence in Biological and Health Security contributes to Biosafety and Biosecurity in a Changing World

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Introduction: Protection against natural, unintentional and intentional biological risks is a challenge no country can face alone. The worldwide risk of biological incidents is fueled by developments in research, increasing international trade, travel and knowledge-sharing as well as international terrorism and non-state conflicts. In order to address these challenges, Germany launched the German Partnership Program for Excellence in Biological and Health Security. The three year program, started in 2013, is funded by the German Federal Foreign Office in the context of its commitment in the Global Partnership against the Spread of Weapons and Materials of Mass Destruction, taking into account its Biological Security Deliverables.

Main body of work: The main aim is to reduce biological security risks for Germany and its partners in Africa, Asia, Europe and South-America. Considering that the program uses a toolbox approach, which allows for customized projects aligned to partnering country's needs. Cooperation has been implemented in six thematic areas: Networking, Awareness Raising, Capacity Building, Detection and Diagnostic, Surveillance and Biosafety and Biosecurity. This approach combines the global reach of Germany's leading project implementing agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH with the expertise of the Robert Koch Institute as central federal institution responsible for disease control and prevention as well as the capabilities of the specialized German research institutions Friedrich Loeffler Institute for Animal Health, Bernhard Nocht Institute for Tropical Medicine and Bundeswehr Institute of Microbiology.

Conclusion: In 22 countries the program fosters responsible conduct in life sciences and strengthens health security using a comprehensive approach. In this context, 20 single projects are intended to help partner countries through intensive collaborations mitigate biological security risks, such as the deliberate misuse of infectious agents and toxins or outbreaks of highly pathogenic diseases and pandemics.

Response to Ebola Virus Disease Outbreak in Nigeria, West Africa: The Zaria experience

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Introduction: The Ebola Virus Disease (EVD) outbreak in West Africa was unprecedented in spread and response. Response to the outbreak was massive within Africa and beyond. The outbreak in Nigeria affected 19 people and led to 7 deaths (CFR 37%). Nationwide there was targeted preparedness to prevent and control EVD. In Zaria, this led to the formation of a joint committee of the Ahmadu Bello University (ABU) and the Ahmadu Bello University Teaching Hospital (ABUTH) to prevent and control EVD in Zaria and environs.

Main body of work: A joint multidisciplinary committee was formed by ABU and ABUTH with representatives from several departments. Subcommittees were Surveillance; Case Management; Infection Control ; Social and Mass mobilization.

The committee conducted seminars and trainings in case management, surveillance and infection control. Mass media campaigns included radio jingles, production of flyers and posters on EVD prevention and control. There was a phone in live radio programme. Screening exercise for raised temperature was conducted and a blueprint was developed. A case of suspected EVD was managed which was confirmed to be dengue.

Conclusion: The committee was enriched by its multidisciplinary nature. A multifaceted blueprint for the control and prevention of EVD was developed within national and global standards. There was lack of funds to fully implement the blueprint.

Keywords: surveillance, response, Ebola Virus Disease, preparedness, control, prevention

Title: Clinical presentation and outcome of Ebola Viral Disease in Lagos Nigeria

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Thematic area: Emerging Infectious Diseases as an accelerating phenomenon and the aftermath of the Ebola outbreak.
Mode of presentation: Oral presentation

Background: The 2014 Ebola virus disease (EVD) outbreak involving 6 countries in the West African sub region was the biggest epidemic since its discovery in Zaire 40 years ago. This study assessed the clinical presentation and outcome of EVD patients admitted in a secondary facility in Lagos Nigeria.

Methods: Retrospective review of records of all suspected EVD patients admitted in Mainland Hospital Yaba Lagos between August 3 2014 to September 12 2014 was conducted. Socio-demographic and clinical presentations of EVD positive and negative patients were compared

Results: Records of 23 suspected EVD patients were reviewed out of which 14 (60.9%) were positive for EVD. The median age of EVD positive patients 31.5 (IQR 30.0, 42.3) was lower than EVD negative patients 40.0 (IQR 28.5, 46.5) ($p = 0.875$). Majority 9 (64.3%) of EVD positive patients were females. Of the 14 EVD positive patients seen, 10 (71.4%) were health care worker as against 4 (44.4) of the EVD negative patients ($p = 0.383$). A significantly higher proportion of EVD positive patients had fever (100% vs 55.6%), vomiting (70.0 vs 44.4), diarrhea (70.0% vs 22.2%), fatigue (77.8% vs 12.5%) and anorexia (80.0% vs 33.3%) ($p< 0.05$) than EVD negative patients. The median length of interval between contact with a suspected EVD patient and development of symptoms was 11.5 (IQR 10.0, 19.5) and 12 (IQR 5.0, 18.5) for EVD positive and negative patients respectively ($p = 0.888$). The case fatality rate of the EVD outbreak in Lagos was 28.6%.

Conclusion: The case fatality rate of the EVD outbreak in Lagos was 28.6%. Fever, vomiting, diarrhea, fatigue and anorexia were the major clinical presentation of EVD positive patients in Lagos Nigeria.

IN SILICO MODELLING OF BIOLOGICAL, GENETIC AND ENVIRONMENTAL FACTORS THAT ENHANCE EPIDEMIC OUTBREAKS OF RNA VIRUS DISEASES

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In the last 20 years, incidence of infectious disease epidemics has increased globally. Most of these diseases are caused by RNA viruses which are the most abundant pathogens infecting humans, animals and plants. Fifty of these have emerged in the past two decades. In the same period, climate change and anthropogenic activities have altered the pattern of occurrence of these diseases resulting in increased incidence, expansion in geographical, host or vector range, and emergence of new diseases.

To ensure survival, RNA viruses have high replication rates resulting in high viral yields. Additionally, they exhibit high mutation rates which confer on them low replicative fidelity that facilitates viral survival in the host ecosystem and this is crucial for development of effective vaccines. Reservoir hosts such as bats, rodents and cattle egrets transmit viruses of public health importance including Ebola, SARS, Lassa and avian influenza viruses. In a previous study, we detected Betacoronavirus sequences in faeces of Nigerian fruit bats. However, despite several studies on RNA viruses, there are still knowledge gaps in their capacity to progress from common infections to epidemics. Key questions that we seek to address include: how do the reservoirs acquire the first infection with these viruses? where do the viruses overwinter during inter-epidemic periods? what are the socio-cultural drivers influencing these disease outbreaks? An understanding of these mechanisms is crucial to predicting aspects of RNA virus emergence and evolution.

To elucidate the biological, genetic, ecologic, anthropogenic and climatic drivers that enhance the capacity of RNA viruses to cause disease epidemics, we propose an in silico model for predicting future outbreaks of these diseases, thus facilitating the development of early warning systems, emergency preparedness plans and policy briefs for national impact.

Evaluation of psychological distress associated with Ebola Virus Disease , and the social support received by survivors, contacts and their relatives in Lagos, Nigeria – 2014
Thematic area: Emerging Infectious Diseases as an accelerating phenomenon and the aftermath of the Ebola outbreak (subtheme: Survivors and survivor welfare)
Preferred mode of presentation: Oral

Authors:
Abdulaziz Mohammed[1], T.L Sheikh[2], Saheed Gidado[1], Gabrielle Poggensee1, Patrick Nguku[1], Adebola Olayinka[1], Chima Ohuabunwo[1], Ndadilnasiya Waziri[1], Faisal Shuaib[1], J.D Adeyemi[1], Ahmed Abubakar[1] Ogbonna Uzoma[1], Funmi Doherty[1], Sarah Nyanti[1], Charles Nzuki[1], Abdulsalam Nasidi[1], Akin Oyemakinde[1], Kayode Oguntimehin[1], Adeshina Abdus-salam1

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Introduction: The Ebola Virus Disease (EVD) outbreak in West Africa is not without psychosocial distress. EVD, like all emerging infectious diseases may be associated with psychosocial distress, which can impact contact tracing and management in poorly, documented way. We set out to determine prevalence and pattern of psychological distress and social support among survivors and contacts of EVD and their relations.

Method: We interviewed 120 contacts and survivors of EVD and their relations in descriptive cross sectional study. General Health Questionnaire was used to assess for psychological distress and Oslo social support scale assessed for social support. Data was analyzed using Epi info 3.3.8.

Results: Of the 117 participants, 93 (79.5%), 4 (3.4%) and 20 (17.1%) were contacts, survivors and relations respectively. Most frequently occurring forms of psychological distress were inability to concentrate (37.6%) and loss of sleep over worry (33.3%). Losing a relation to EVD (OR=6.0, 95% CI, 1.2 – 32.9) was significantly associated with feeling unhappy or depressed, while being a health worker was protective (OR=0.4, 95% CI, 0.2 – 0.9). Multivariate analysis revealed losing a relation (AOR=5.7, 95% CI, 1.2 – 28.0) as an independent predictor of "feeling unhappy or depressed" and loss of a relation (AOR=10.1, 95% CI, 1.7 – 60.7) a predictor of inability to concentrate. Having no tertiary education remained protective (AOR=0.2, 95% CI, 0.1 – 0.6).

Conclusions: Survivors and contacts of EVD and their relations develop psychological distress predicted by loss of family member. We recommended that psychiatrists and other mental health specialists be part of case management team and other clinicians attending to EVD patient/survivors receive training in identifying psychological disorders.

Isolation and sequence analysis of novel reassortant H14N3 from Pakistan: an evidence of reemergence of rare Influenza Virus subtypes in Asia

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Since the isolation of original four isolates of H14 Avian Influenza Virus in central Asia during 1982, these rare viruses had never been reported in any Asian country. Exceptionally, the four H14 isolates recovered from Wisconsin and California during 2010-11. Interestingly in 2014, during AIV surveillance three H14N3 isolates recovered from Duck, Geese and Pigeon from wet market in Pakistan.

The whole genome sequencing revealed introduction of a unique reassortant Eurasian-American avian strain into Pakistan. Phylogenetically HA gene shares 92% nucleotide sequence identity with H14 from Wisconsin and California. The NA genes showed 97.7% homology with European H11N3. The M, PB1, PB2 and PA genes were Asian in origin whereas NS and NP genes showed maximum sequence identity with the Pakistani H3N1 and H4N6. Sequence analysis revealed a LP amino acid motif (PDKQAK) at HA cleavage site, avian-like receptor specificity (Q243, G241) and 7 N- linked glycosylation sites while 2 glycosylation sites were lost due to S23I and N278G mutations.The amino acids known to be associated with sensitivities to antiviral drugs (oseltamivir, zanamivir, amantadine) were found conserved. Seroprevalence was negligible in various birds species.

These observations suggested that these AIVs may persist in environmental stasis for long periods of time, undetected by surveillance, until a time when agent, host, or environmental factors allow for reemergence in susceptible hosts within a region. The various point mutations in these novel reassortantH14N3 and close relationship with American, European and Asian AIVs also reflect the genetic diversity and intercontinental spread.

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To be at Presented at the 2nd African Health Systems – Building Epidemics and capacity to tackle epidemics threats: Biosecurity and infrastructure. The aftermath of the Ebola outbreak.

TITLE: The Ebola virus disease laboratory response. The Sierra Leone Experience.

AIM: To present the strategies undertaken to respond to the diagnostic challenges encountered during the Ebola outbreak in Sierra Leone.

Methods: The Ebola Virus Disease was first diagnosed at the Virus Hemorrhagic fever laboratory in Kenema Hospital, Eastern Sierra Leone on May 24, 2014.

This is a research laboratory which has been conducting Lassa fever research in the country for over a decade. This Laboratory served as the only diagnostic facility for Ebola virus disease during the initial phase of the epidemic.

However, as the epidemic spread all over the country, considerable difficulties emerged including transportation of samples on rugged roads from far away distances times and a marked increase in the number of sample thus delaying the response due to prolonged turnaround times.

The capacity of this laboratory was soon outstretched with the rapidly advancing epidemic thus necessitating the deployment of several mobile laboratories countrywide to shorten the turnaround times and improve efficiency.

The laboratory plays a critical role in combating the Ebola virus disease. Laboratory results are required for vital decision making such as quarantine of households and communities, treatment and discharge of patients.

False negative and false positive results and prolonged turn around times could have a devastating effect on the epidemic.

At the peak of the epidemic, 16 International Laboratories were deployed.
The work of these laboratories was facilitated by ensuring an efficient Pre analytical phase and Post Analytical Phase: Collection, Packaging and Transport of samples and the Dissemination of the result to various stake holders for action.

The reactivation of the Laboratory Technical working group was effected to serve as the laboratory pillar to devise strategies, to ensure an efficient laboratory response, build on successes, solve mitigating factors and challenges.

The membership included a Laboratory Physician as Chairman. Other members included

Laboratory Scientists, Medical planners, Management experts and Logisticians
The interventions include:

1. SPECIMEN MANAGEMENT

- Development and distribution of specimen collection, stock list and protocols.
- Development of Human Resource plan and conduct of training nationwide.

2. SPECIMEN TRANSPORTATION

- Engagement of the Sierra Leone Military to serve as transport courier and established travel route.
- Developed and implemented chain of custody forms.

3. LABORATORY TESTING QUALITY ASSURANCE

- Implementation of External quality assurance and quality audits.
- Harmonization of processes and testing algorithms.

4. RESULTS DISSEMINATION

- Training of Laboratory Liaison officers to document and disseminate laboratory results directly to stakeholders by phone and electronically.

5. CO ORDINATION

- Daily meeting of the LTWG and Weekly meeting of the Top technical team which includes representatives of all the laboratories.
- Support Supervision to identify training needs.
- Phased closure of Laboratories with case scaling down.
- Development and implementation of transition plan.

6. BIO-BANKING AND BIO SECURITY

- To establish a national repository for safe storage and security of biological specimens for use in the development of an effective public health system.
- Short term focus is to store all Ebola positive samples and 10 percent of negative samples.

Results: The Ebola outbreak has been contained and there are only four Labs operating in country. During the period of operations over 100,000 samples were collected and tested by the laboratories in a very efficient manner. The samples included blood, swabs, semen, etc samples.

Rejection rate of samples by the laboratories were very low indicating a good specimen collection, Packaging and transporting system.

There was no report of EVD Infection of the of the pre Analytical and Post Analytical team after the intervention of the Laboratory Technical working group.

EMERGING INFECTIOUS DISEASE FACULTY

A total of 26 Science graduates has undergone basic training in Molecular Biology to serve as a rapid response team for future outbreaks of EVD and other infectious Diseases.

A bio repository policy and strategic plan is being completed. An inventory of all the samples collected has being done and locations verified.

Operational Manuals developed and implemented included:

- Specimen management supplies kit menu
- Chain of custody form
- Transportation route map
- Facility readiness audit
- Result reporting template
- Quality assurance

Performance indicators monitored include:

- Symptoms onset Vs time of specimen collection
- Time of lab receiving specimen Vs time of testing
- Time of testing Vs time of result released
- End to end turnaround time
- Lab capacity Vs work load

The challenges included:

1. Unilateral Actions by partners and Independent actions on specimen protocol.
2. Prioritization of research by the laboratories
3. Limited financial support for support supervision
4. Untimely Vehicular maintenance
5. Gross shortage of local lab personnel
6. Limited cold chains in remote areas

Conclusion: This presentation outlines strategies undertaken to effect a successful Ebola laboratory response in a poor resource country. Efforts should be made to have more capacity readiness for infectious diseases in the Country and the Sub Region to prevent over dependence on international partners whose response usually comes late and the motivating factors may be more that just saving lives.

Oral Presentation Submission under Theme 1 (d)
Title: EMERGING DEADLY EPIDEMICS IN AFRICA: SOME OVERARCHING PARAMEDICAL ISSUES AND CONSIDERATIONS

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Introduction: The occurrence of a deadly infectious epidemic like Ebola in recent experience in West Africa is an event liable to disrupt normality in practice, rules of procedure, policy and theory in any society. Among the most important areas of normality that may thus be disrupted are ethical standards and practice in medical treatment and research. It is thus obviously important to consider, outside of the panic and emergency of a raging epidemic, the ethical rules of procedure that would be appropriate and justifiable during a deadly infectious epidemic, for medical treatment and medical research. But in the particular case of Africa, a previously colonized and severely exploited continent, certain overarching issues, such as supremacist racism, poverty, corruption and failure in governance, impose themselves for consideration in any serious indigenous attempt at addressing, from the point of view and perspective of medicine and medical sciences, the problem of the ethical standards and rules of procedure to be followed during an emerging deadly epidemic in Africa.

Main Body: Considering the recent outbreak of an Ebola epidemic in West Africa, we examine the ethical imperatives that were appropriate and rationally justifiable in that situation for medical treatment and medical research, respectively. We briefly review the history of the Ebola disease, the capacity of the affected countries to deal with it, and we critically examine some of the directives and recommendations of the World Health Organization (WHO) as the epidemic unfolded; and then we draw conclusions regarding what procedures appear most rationally and ethically defensible for treatment of epidemic victims in imminent danger of death and for research towards finding a cure or a vaccine against the disease.

A deadly infectious epidemic is an ideal event to throw any unprepared country into total confusion or lethargic inaction. And any situation of calamity or catastrophe always opens up wide possibilities for both philanthropic altruism and calculated opportunism. The distinction between a treatment context, where total concern is focused on the interest and well-being of the patient, and a research context, where gaining knowledge on a disease for the benefit of future patients and society as a whole, is an ethically significant one. However, the two contexts need not be completely mutually exclusive, for records and notes from the purely treatment context can be of great value for the research context.

Conclusion: During a deadly infectious epidemic like Ebola, it is ethically imperative to concentrate all efforts towards saving lives and bringing the epidemic under control and generally inappropriate to conduct research solely aimed at gaining knowledge for future use which is appropriate only after the deadliness of the epidemic has been brought under reasonable control.

Title: Balancing The Scale Of Preference In National, Sub-Regional And International Response To VHF Outbreaks In West Africa: Moving From Ebola To Lassa Fever.

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Thematic area: 1

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Introduction: Although there have been repeated outbreaks of Lassa fever (LF) over the years in the countries which were most affected by the recent West African outbreak of Ebola, there were curious omissions in deploying the experience from LF control during the outbreak. The recent Ebola outbreak was thus notable in the tardiness of the initial responses even though it brought much attention and financial support to bear on the control of Ebola. In contrast, LF remains a truly neglected tropical disease, insufficiently prioritized by national governments in the sub-region and also curiously of relatively little attractive to the international community. However, without being unmindful of the many factors at play, it is reasonable to expect that a linkage of the control efforts targeted at the 2 severe VHFs holds the promise of quick and sustainable gains in overall VHF outbreak preparedness and response in the Sub-Region. A framework for this approach is presented in this paper.

Main body of work: Comparative review of the literature on the epidemiology, pathogenesis, pathophysiology, clinical manifestations, public health and medical control measures, outcome and outcome determinants of Ebola and Lassa fever.

Summary: The caseload of Lassa in West Africa outweighs that of Ebola while the case fatality ratios in severe cases are comparable. The quantitative and qualitative aspects of the epidemiology, presentation, control and outcome determinants of the 2 diseases are largely similar but there are marked differences in media coverage, evoked public response, and

prioritization of the control efforts. We conclude that the extensive similarities between the 2 contemporaneous severe VHFs in West Africa could form the basis of a useful linkage in VHF control, and recommend that urgent action is taken in this direction.

Key Words: Ebola; Outbreak Preparedness and Response; Lassa fever; VHF Control Framework; West African Sub-Region.

Title: Spatial-Temporal And Case-Outcome Analysis Of The 2015/2016 Outbreak Of Lassa Fever In Nigeria

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Thematic area: 1

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Introduction: There was an upgrading of the perennial Lassa fever (LF) outbreaks in Nigeria between 2006 and 2007 in terms of the geographical distribution of cases. In contrast, the fatality rate declined. However, by January 2016, there were indications of an untoward trend in the outbreaks. We sought to determine significance of this trend and the factors responsible and the results are reported in this paper.

Main body of work: Prospective data on the outbreak from July 1st 2015 to June 30th 2016 were stored at the Institute of Lassa Fever Research and Control and analyzed for the yield of reverse transcriptase polymerase chain reaction (RT-PCR) tests (ratio of confirmed to suspected cases), severity of infection (rate of bleeding manifestations) in confirmed cases and outcome (case fatality rate) of hospitalization of confirmed cases. These indices were compared with those of historical controls drawn from the period 2009 – 2010. The diagnosis of LF was confirmed by RT-PCR test. Rates were compared between groups using chi-square test and $p < 0.05$ taken as statistically significant.

Summary: 139/1747 (8.0%) suspected cases in 2015/2016 versus 198/1650 (12.0%) in 2009-2010 (OR (95% CI) = 0.63 (0.51, 0.8), $p < 0.001$) had confirmed infections. 42/119 (35.3%) versus 19/170 (11.2%) (OR (95% CI) = 4.33 (2.36, 7.96), $p << 0.001$) confirmed cases presented with bleeding and 29/53 (54.7%) versus 59/166 (35.5%) (OR (95% CI) = 2.19 (1.17, 4.10), $p = 0.020$) confirmed cases hospitalized at the Irrua Specialist Teaching Hospital died. We conclude that LF in Nigeria has upgraded in terms of the caseload, geographical distribution, illness severity and case fatality ratio. The associated factors and implications are discussed.

Key Words: Factors: Implications; Lassa fever; Trends in the outbreaks.

Era of Emerging Infectious Diseases (EID) and the Aftermath of the Ebola Outbreak
Abstract on: Challenges of Nigerian Health Journalists In Covering 2014 EVD Outbreak

Author: Yinka Shokunbi
The Headquarters of most of the Nigerian media are located in Lagos State and so most of the health writers or Health Editors are based at the headquarters while a handful are in the FCT, Abuja being seat of government.

The outbreak of Ebola Virus Disease (EVD) in July 2014 was though unexpected, but it wasn't the first time Nigerian health journalists would be reporting epidemics; there had been a couple of outbreaks in the past such as Meningitis, Wild Polio Virus, Cholera, Lassa Fever among others.

The outbreak of EVD was however different because it was a contagious and infectious disease with very high fatality rate and it was indeed the first time most health journalists were faced reporting such a disease that posed a life threatening challenge to them and no one was prepared for it.

Prior to the outbreak of EVD, Lagos State government had in place Emergency Preparedness and Response Management Team as well as surveillance team who had been trained and grounded to respond appropriately. However, there was a missing gap.

Health writers or Journalists were never a part of the training for the EPR. The media component of reporting epidemics was missing.

At the onset of the EVD outbreak, the media contributed to the fear in the land through inaccurate reporting, misuse of terms and terminologies, rumour among others.
The World Health organisation (WHO) team in collaboration with Federal Ministry of Health had to organise a crash training for damage control.

Lessons: In the era of emerging infectious diseases, the role of the media is key. Health and medical writers are stakeholders and partners in closing the gaps to build sustainable development.

TREATMENT OF EBOLA WITH CONVALESCENT WHOLE BLOOD IN FREETOWN, SIERRA LEONE.

Sahr,F.DSc;Ansumana R.PhD; Massaquoi,TA.MBChB; Idriss,BR., MBChB; Sesay F.MBChB; Lamin JM. MPH; Baker,S. MD,MPH; Nicol, S.MD; Conton,B DPT; Johnson,W.MSc; Abirie,O.MSC; Kargbo,O.DMLS; Kamara,P.DMLS; Goba,A.BSc; Russell, JWB.FWACP; Gevao,SM. FWACP

Background: Convalescent blood therapy has been a promising form of treatment for Ebola Virus Disease (EVD), but less attention has been focused on it for treatment.

Method: We assessed the effectiveness of convalescent whole blood (CWB) in the treatment of consented EVD patients. We recruited 68 subjects at the 34 Military Hospital in Wilberforce, Freetown. Forty-four were given CWB and 28 were excluded; all were given routine treatment used at the ETU.

Results: One of 44 subjects treated with CWB dropped out of the study and 31 recovered while 12 succumbed to the disease with a case fatality rate of 27.9%. For the group that were given routine treatment without CWB, 11 died with a case fatality rate of 45.8%. There was a significant difference between admission viral load and viral load after the first 24 hours of treatment with convalescent whole blood (P□0.01).

Conclusion: CWB is suitable for treating EVD in resource-poor settings, especially in the early phases of outbreaks when resource-mobilization is done. An earlier implementation of this practice in Sierra Leone during the recently concluded EVD outbreak could have helped contain the outbreak.

Does ABO and Rhesus blood group affect susceptibility to, and prognosis of Ebola virus infection?

Conton, Brian[1&2]; Gevao, Sahr[1&3]; Sahr, Foday[3&4]; Kargbo, Osman[1&5], Kamara, Philip[5]; Bah, Abdulai[3]; Massaquoi,Thomas[4]; Idriss, Baimba[4], Sesay, Foday[4]; Williams, Adeshola[6]; Baker, Samuel[5]; Nicol, Sylvester[6]; Russell, James[3];

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Background: In 2014, the largest Ebola outbreak known to man, thundered through West Africa. It infected close to 30,000 people, and killed over 11,000. Yet, though we have known about Ebola for almost forty years, little data is available on survival and infection patterns of this viral hemorrhagic disease. Examining parallels between blood groups and human disease susceptibility is a valid, and increasingly used method of finding such patterns.

Method: This study permitted the observation of the different blood groups in Ebola infected patients and survivors. This was compared against the blood group distribution of the general population as well as those within the study, who succumbed to the disease. Blood group A in particular rose to 36.36% of the survivor population in our study, when it only forms 21.1% of the normal population. It formed 9% of the deceased group.

Results: The results show that the disparities in the blood group profiles of the general population, infected patients, survivors and deceased are marked enough to infer that ABO and Rhesus blood groups could be a factor in the infection and survival of Ebola Virus Disease (EVD).

Factors fueling the Emergence of Infectious Diseases

Oyewale Tomori

President, Nigerian Academy of Science

Africa remains the verdant pasture for the emergence and re-emergence of infectious diseases. Between 1970 and 2016, African countries reported 1,779 outbreaks of thirty-nine different diseases caused by bacteria, parasites and viruses.

The frequency of reported outbreaks of disease epidemics increased from an average of six between 1970-1980) to thirty-five between 2005 and 2016. Of the 1779 reported outbreaks, 118 (6.6%) were undiagnosed.

The contributory and inter-related factors responsible for the emergence/re-emergence of infectious diseases in Africa include:

i) A friable and weak health care delivery system

ii) Poor disease surveillance and control,

iii) Erratic and fickle political commitment combined with misplaced national priorities,

iv) Unplanned population growth and uncontrolled rural-urban migration

v) Behavourial/cultural practices

The successful control of infectious diseases in Africa is dependent on appropriately addressing the issues associated with the emergence/re-emergence of the diseases.

The Engagement of the German Partnership Program for Excellence in Biological and Health Security in the context of the recent Ebola Outbreak

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Introduction: Protection against natural, unintentional and intentional biological risks is a challenge no country can face alone. The worldwide risk of biological incidents is fueled by developments in research, increasing international trade, travel and knowledge-sharing as well as international terrorism and non-state conflicts. In order to address these challenges, Germany launched the German Partnership Program for Excellence in Biological and Health Security. The program is funded by the German Federal Foreign Office in the context of its commitment in the Global Partnership against the Spread of Weapons and Materials of Mass Destruction, and adapted its activities with respect to the recent Ebola outbreak.

Main body of work: The main aim is to reduce biological security risks for Germany and its partners in Africa, Asia, Europe and South-America. Considering that the program uses a toolbox approach, which allows for customized projects aligned to partnering country's needs regarding Networking, Awareness Raising, Capacity Building, Detection and Diagnostic, Surveillance and Biosafety and Biosecurity. This approach enables partnering countries to combat emerging infectious diseases. During the recent Ebola outbreak, activities were implemented including inter alia the establishment of diagnostic capabilities through training and support for laboratory infrastructure or expert missions in the European mobile laboratories (EMLabs) to support Ebola diagnostics. Besides technical advice and equipment, support is provided to partner countries in preparation for a possible incident with new emerging diseases.

Conclusion: The program fosters responsible conduct of life sciences and strengthens health security using a comprehensive approach in 22 countries. In this context, 20 single projects are intended to help partner countries through intensive collaborations to mitigate biological security risks, such as the deliberate misuse of infectious agents and toxins or outbreaks of highly pathogenic diseases and pandemics. In this context, the program contributes to tackle epidemic threats in the aftermath of Ebola or other emerging infectious diseases.

PROVIDING ETHICAL GUIDANCE IN EMERGENCY SITUATIONS: ACHIEVEMENTS, CHALLENGES, AND FUTURE PROSPECTS OF ECEPAS WORKING GROUP

Francis Kombe CBPPM, PGDPH, MPH
ECEPAS WORKING GROUP

Research and response during the recent EVD outbreak brought to the fore, once again, concerns about poor participation of experts and professionals with origin or base in African countries, 'parachute' research, and mistrust in the interests of the foreign teams that usually come into the countries to lead such responses. The Global Emerging Pathogens Treatment (GET) consortium, a predominantly African led Non-Governmental Organization (NGO)/ Non-Profit organization with membership drawn from 35 African countries was established to address these concerns. GET mission is to promote the strengthening of all African stakeholders to gain the capacity for timely and effective mitigation strategies against emerging infectious and neglected pathogens, particularly in regions with compromised capacity due to conflict, climatic variation or ecological disruption. GET works to advance clinical trials to counter the risk posed to Africa from the increasing threat of Emerging Pathogens.

In its quest to explore the evidence of the usefulness of convalescent plasma in controlling EVD, GET faced a number of issues that were challenging, in terms of the ethics of using survivors of EVD, a particularly debilitating disease as subjects for research, and who were predominantly poor with limited resources to even provide themselves adequate nutrition for optimal recovery post EVD. This led to the establishment of the ECEPAS working group to provide guidance to GET researchers and their collaborators on how best to protect and respect the interest of research participants involved in various therapeutic and preventive interventions.

In line with the mandate given by GET, ECEPAS operates under three distinct but overlapping pillars that include a) Promoting ethical conduct of research; b) Advocating for respect and protecting the interest of Ebola Virus Disease participants involved in clinical trials; and c) Promoting appropriate levels of community engagement in areas where research is conducted in order to ensure communities are made part and parcel of the research planning and implementation.

ECEPAS has been involved in reviewing clinical research protocols as well as directly engaging with study PIs and researchers to ensure health research conducted by or in collaboration with the GET consortium is scientifically and ethically sound. ECEPAS has a well-defined leadership involving a chairperson, co-chairpersons, a secretary and members drawn from different regions and disciplines. Due to the diversity of its membership, ECEPAS operates using virtual meetings and shares the minutes to the executive board of directors to inform GET overall strategic decision making.

Here, we describe in more concise terms the ethical issues that necessitated the establishment of ECEPAS, operational modalities, how the group has helped address the issues and its outlook going forward in contributing towards addressing ethical issues in research and response to disease outbreaks from emerging infectious and neglected pathogens in Africa

Biosecurity & Biothreat Reduction Faculty

Welcome Message

There is increasing awareness of the need to deal with disease regardless as to whether it originates from nature, accident or a deliberate event. This is particularly true of emerging infectious disease and sits at the heart of the Global Health Security Agenda (GHSA).

When a disease presents in an unusual form, with unusual severity or in an unusual location, there will often be suspicions that it was altered and introduced deliberately. Whilst such occasions are very rare, such fears may not be unfounded. There is a long history of States and non-state actors attempting to use disease as a weapon, though such activities are prohibited under international law.

There is a clear need to maximize the ability, through a **One Health approach**, to prevent and mitigate emerging infectious diseases, and to combat the spread of other especially dangerous pathogens, whilst at the same time minimizing the risks that the associated pathogens, equipment or knowledge will be diverted for hostile purposes. Biosecurity, in this context, covers the wide range of policies, practices, measures and activities used by states, institutions and individuals to prevent the life sciences and health capacity being used to produce biological weapons. Over the next three days we will consider biosecurity in an African context, exploring how best-practice might be implemented in a way that it enables safe, secure and sustainable research and development on the continent.

Such research and development will necessitate access to high-quality, pedigree samples of the emerging infectious diseases most relevant in Africa. Too often samples of these diseases have resided solely in international laboratories. There are occasions where it has been difficult to obtain samples of diseases taken in Africa, from Africans, domestic animals, or wildlife for research in Africa for diseases that disproportionately affect the continent. Having suitable capacity to store samples in Africa and connect them with relevant data, so that they might enable indigenous research and development is a cornerstone of taking a more active role in this important public health enterprise. Over the next three days we will explore the challenges and opportunities for strengthening biobanking capacity in Africa.
On behalf of the convenors and the programme development and organising team, we wish to welcome you all to Lagos, and to the 2nd African Conference on EID and Biosecurity. We trust that you will have many opportunities over the next three days to share and learn from colleagues attending this seminal conference.

Dr. Piers Millett, Biosecurity and Biobanking Faculty Chair.
Dr. Rebecca Katz, Biosecurity and Biobanking Faculty Co-Chair.

Title: Relationship and interactions in management of Bioethics Biosecurity and dual-use research of concern

Author(s): Josyline Kaburi
Institutional address: Kenya Medical Research Institute (KEMRI)

Introduction: Bioethics is the study of the ethical and moral implications of new biological discoveries and biomedical advances, as in the fields of genetic engineering, drug research, medicine and other fields. Biosecurity is protection, control and accountability for valuable biological materials within laboratories, to prevent their loss, theft, misuse, diversion of, unauthorized access or intentional release while on the other hard dual use research of concern is the concept that the Knowledge and technologies generated by life sciences research for peaceful purposes but that may be misused to pose a threat to public health and/or national security.

Main body of work: Application of bioethics requires balancing of law, politics and practice of arbitration. This means one has to consider the code of values (integrity), accepted and especially professional standards (ethics) bearing in mind the principles of right and wrong (morals). The main bioethical areas of concern includes Biorisk management and in dual use research among others. Biosecurity is concerned about the research being done while Dual-Use research is concerned with where research is going. Safe and secure laboratories ensure containment of hazardous infectious substances within laboratories. This will help maintain citizens' confidence in the activities of the bioscience research, increase transparency to investors in biomedical and biotechnology industry as well as protecting valuable research.

Conclusion: Technical advances in modern molecular biology have increased the risk that research could be used against us by those with malicious intent. It is important that biologists increase their awareness of biosecurity issues and learn to assess their research in terms of modern security concerns to minimize that possibility.

Thematic area: Biosecurity and Biothreat Reduction
Preferred mode of presentation: Oral

The Essential Role of Biosecurity Education in Fostering a Culture of Responsibility in the Life Sciences

Oral Presentation
Tatyana Novossiolova, PhD
University of Bradford UK

Thematic Area
2. Biosecurity and Biothreat Reduction: Biobanking, Bioinformatics, Biosafety, Biosecurity and Bioethics concerns in the aftermath of the largest Ebola outbreak known to man.

Introduction: The presentation addresses biosecurity understood as successful minimising of the risks that the biological sciences may be deliberately or accidentally misused in a away which causes harm to humans, animals, plants or the environment, through enhanced awareness and understanding of those risks. Biosecurity is an overarching concept encompassing a web of preventive policies, measures, and practices focused on the 1975 Biological and Toxin Weapons Convention (BTWC) that seeks to ensure that biotechnology is utilised only for peaceful, prophylactic, and protective purposes.

Main Body of Work: One topic that has received considerable attention among the BTWC States Parties is the role of engaging life scientists with issues of biological security as a way of strengthening the national implementation of the Convention. The presentation reports on a project jointly funded by Canada and the UK under the Global Partnership, as part of which two online books on biological security have been developed. The books feature a chapter specifically focused on the 2014 Ebola outbreak and the implementation of biosecurity within the context of natural disease outbreaks. The books are presented in some detail; the importance of active learning is discussed; and useful guidance and tips on course development are outlined.

Conclusion: The presentation concludes by outlining a set of key points for consideration with regard to the implementation of biosecurity education and capacity-building programmes with a view of the upcoming Eighth Review Conference of the BTWC to be held in November 2016 in Geneva.

Operationalizing retrospective biobanking of dangerous samples in a post outbreak scenario- A sierra Leone experience.

Conton B[3&6], Gevao S[1,3&4], Williams A[3], Elie J[3], Taylor–Pearce M[3], Rogers J[2], Abayomi A[3&5]

1. **Ministry of Health and Sanitation of Sierra Leone**
2. **Office of National Security**
3. **Global Emerging Pathogens Treatment Consortium**
4. **College of Medicine and allied Health Sciences**
5. **Stellenbosch University**
6. **Physio-Fitness rehabilitation Centre**

Introduction: In the aftermath of the 2014-15 Ebola outbreak, samples were left across the subregion, in partner labs without the containment infrastructure to keep them from accidental or malicious discharge.

As the medical emergency waned, resources, both foreign and domestic, were reprioritized. Samples were either abandoned as labs closed or exported, sometimes without proper transfer agreements. Moral of the staff in the labs left open had dropped. They have seen how the blood of their countrymen had been removed. The research done, sometimes failed to acknowledge those that had put themselves at risk to obtain the samples in the first place. Their social status had gone from highly solicited personnel endowed with substantial risk allowance during the outbreak, to mid level government workers whose regularity of salary was not assured. This biosecurity gap was recognized early in the outbreak by GET, who became prime movers in seeking international assistance to develop local capacity to handle outbreaks of this nature in keeping with international treaties on biosecurity.

Method: Retrospective biobanking after an outbreak of this magnitude had never been undertaken. It required us to start by reconstituting all the data assignable to every sample. This included the demographic, clinical, diagnostic, storage, pre-analytic and research information which would help us evaluate quality and quantity of the sample. Reintegrating that data with its sample. Reuniting every sample with its donor as well as other sibling samples. Verify and validate the data with what was actually in the freezers. This was just the data rescue aspect of the project.

On the Sample rescue aspect of the project, the different levels of stakeholders had to be sensitized and upskilled. Samples had to be relocated from their scattered rudimentary field laboratories used during the outbreak to more secure facilities under control of the Office of National Security where they would be held till the full biobank was built and installed.

These arms are funded separately by different sponsors. The project is split up into three phases of Pilot, mobilization and implementation that have to be synchronized across the requirements of the funders. The technical demands requires skill sets that are difficult to find. The workflow demands, the management of indigenous professionals at the peak of their various disciplines.

Conclusion: The result has been an indigenously designed and programmed database that assigns pedigree to samples, tracks quantities used and current storage locations. With the greater awareness of biosecurity countrywide, there is now a draft biosecurity and biobanking policy being discussed for ratification. There is an organized schedule for the relocation of samples under the Office of National Security in coordination with the Ministry of Health.

Standard Operating Procedures for movement of bio hazard materials have been put in place from the training conducted by GET. International experts on biocontainment design are collaborating with the Government of Sierra Leone through GET to develop a facility comprised of a biosafety and biobanking infrastructure that will be appropriate and effective for this environment.

Integrated Approach in Addressing Biosafety and Biosecurity Capability Building in the Era of Global Health Security Agenda: Case of the Malian Association for Biosafety and Biosecurity (MABB)

Sangare D., Traore Z.I., Drame B. S. I., Kone A., Kodio M., Sarro Y. S, Ba M., Diarra A., Sylla L., Odile O., Fofana L., and Kassambara H.,

GHSA is a multilateral and multi-sectoral approach aiming to reinforce prevention, detection, and response capacity toward the containment of infectious diseases in US and partners countries. GHSA Action Package-Prevent-3 is solely dedicated in strengthening Partner countries capacity in Biosafety and Biosecurity. The need for building Biosafety and Biosecurity capacity and capability is crucial, and requires a strong national and international collaboration. MABB is a leading professional association working in the field of Biosafety and Biosecurity in Mali.

GHSA-CRS-DJOMI project funded by CDC give the opportunity to MABB to take action toward developing and strengthening its capacity as well as developing references documents. The main objectives were to assess MABB existing capacities and capability in order to fill the gaps; Assess existing capacities to have initial data about biosafety, biosecurity, biorisk management in Mai; and finally to develop reference documents specific to Mali.

To achieve those milestones MABB used and holistic and integrated strategies to address different components, but the internal organization of the association was the key for success. In results, 14, and around 30 MABB members were respectively certified in biorisk management; in transport of infectious material and laboratory biosafety and biosecurity by IFBA.

The sites evaluation yields alarming results since none of the sites achieved 50% of compliance regarding the evaluated components. Reference documents (Manual SOPs for transport and shipping of infectious samples in Mali, and trainings modules) were developed and validated. However, the National Biosecurity Policy remains challenged by many external factors.

In conclusion, Biological safety association are pillar for the capacity building of biosafety, biosecurity and biorisk management.

Therefore, it become crucial for government and partners to closely work with those associations in order to fully address national and international biological safety issues in the area of GHSA.

Title: Clinical features of 452 Ebola Survivors who presented at the 34 Military Hospital, Survivors Clinic

Author - Capt (Dr) Robert Sesay
34 Military Hospital , Freetown , Sierra Leone.
To be at Presented at the 2nd African Health Systems – Building Epidemics and Capacity to tackle epidemics threats: Biosecurity and infrastructure. The aftermath of the Ebola outbreak.

Aim: To assess the Post Ebola syndrome and to create a platform for research interventions

Methods: The Ebola survivors clinic was established in December 2014, It is the largest survivors' clinic in Freetown and it operational Hours are: Monday-Friday.

The clinic provides free consultations, laboratory services and medication. To date the clinic has 452 survivors, of which 49.3 % are males, 47.4% are females.

The clinic uses a specially designed data sheet to collect information on the survivors. These include: Demographic data, date of ETU admission and discharge, presenting complaints, vital signs etc

Results: The clinical features documented include; musculoskeletal pain, eye problems (blurred vision, red eyes, eye pain, and discharge), skin problems (itching, rash), Urology problems (decrease libido, erectile dysfunction, scrotal swelling), constitutional symptoms (headache, weakness, fever) etc. The most common manifestation observed is musculoskeletal (Myalgia, Arthralgia) and constitutes over 80% of the presenting features.

Conclusion: Survivors have many sequelae, some of which might have a long term debilitating effect. There is need for future research to determine the pathogenesis of the post Ebola Syndrome and its relationship with the Persistence of the Ebola Virus for weeks or months in selected body compartments of survivors.

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Title:
Role and Experience of a Medical Laboratory Scientist in mitigating the Ebola Epidemic in Sierra Leone.

Author:
Hafiju Maada Kanja
Centre of Excellence Laboratory, Marie Stopes Sierra Leone.
To be presented at the 2nd African Health Systems- Building Epidemics and capacity to tackle epidemics threats: Biosecurity and infrastructure. The aftermath of Ebola Outbreak to be Held in Lagos, Nigeria

Aim: To present the role played and experiences gained by medical laboratory Scientists in the 2014 EVD Epidemic in Sierra Leone..

Method: The first Ebola patient was diagnosed at the Kenema Government Hospital Laboratory by a colleague Mr Augustine Goba on May 24, 2014. This laboratory hosts both the Lassa Fever Research Laboratory and the routine diagnostic service for the hospital.

The Medical Laboratory Scientists in this laboratory played a pivotal role in the diagnosis of Ebola Virus disease in this laboratory before the deployment of international field laboratories. Routine haematology, microbiology and chemical pathology services were still operational in the same laboratory. This presentation describes the operational challenges encountered and the effect on staff morale, morbidity and mortality.

Results: There was an initial high toll of death amongst laboratory staff, due to lack of biosafety training and PPE supplies. Seven laboratory staff, seven of whom were from the routine clinical laboratory department at the Kenema Government Hospital and were deployed at Ebola specimen collection centre including one from the biosafety containment lab, contracted the EVD and died within seven days.

Only one laboratory scientist in the Lassa Fever biosafety containment Research laboratory was suspected of contracting the disease. Initial results were positive but repeat testing revealed a false positive result and is still alive.

Specimen management was later handled and supervised by the Laboratory technical working group after the deployment of the multinational field laboratories. Various strategies were devised and implemented based on initial experience from the Kenema Government Hospital leading to improved operations and a drastic reduction in the Ebola infection rate amongst health workers.

Conclusion: There is a need to offer continuous training and enforcement of Infection, prevention and control measures to all laboratory workers including provision of adequate supplies of PPE at all times to prevent mortality and morbidity from endemic and emerging infectious pathogens.

BUILDING BIOSECURITY FROM THE GROUND UP: OIE RESOURCES AND TOOLS

Julie R. Sinclair, MA, DVM, MPH, DACVPM

The World Organisation for Animal Health (OIE) is an intergovernmental organization established in 1924 in an effort to prevent global disease spread. The OIE consists of 180 member countries and has cooperative agreements with 55+ organizations. The OIE's global vision is economic prosperity and social and environmental welfare of populations: protecting animals, preserving our future.

The OIE delivers timely, high quality information and services to allow the management of risks to terrestrial and aquatic animal health and welfare, minimize associated dangers to human health, and protect the environment and biodiversity in a "One Health" approach. This presentation will focus on the specific OIE resources and tools that countries can access to build biosecurity: infrastructure, informatics, mechanisms, and human resources.

In particular, this presentation will highlight the OIE's international standards' development, global data sharing, Performance of Veterinary Services (PVS) Pathway, Vaccine Banks, and Twinning Projects.
www.oie.int

Science Communication & PLUS Faculty

Welcome Message

The Science Communication & Public Learning and Understanding of Science (PLUS) Faculty of this Conference has been conceptualised and realised as a uniquely game-changing Forum for the advancement of science communication and the public learning and understanding of science policy, practice and programme development, capacity-building, and the containment of EID's, in Africa. It is highly opportune that this Faculty has been initialised by this Conference, in the context of Africa's challenges in the containment of EID's. Communicating scientific ideas effectively to the public was critical in the containment of the Ebola epidemic that broke out in West Africa in December 2013 and quickly threatened evolving into a pandemic. Scientific ideas that inform public health imperatives may run counter to habitual or cherished social and cultural practices and, in such cases, call for very careful communication, quick learning and understanding of the underlying science.

The challenges to the delivery of innovative, inclusive and empowering science communication and PLUS in Africa are many and severe, and are often different to the contexts, conditions and scenarios found in other regions around the globe.

This Conference is thus, an opportunity not only to strengthen the skills, capabilities, knowledge-base, networks and strategies of practitioners in the sector, but also to accelerate the promotion of evidence-based practices that have the potential to influence policy and deliver systematic change in Africa's development framework.

On behalf of the convenors and the programme development and organising team, we wish to welcome you all to Lagos, and to the 2nd African Conference on EID and Biosecurity. We trust that you will have many opportunities over the next three days to share and learn from colleagues attending this seminal conference.

Dr. Elizabeth Rasekoala, Science Communication & PLUS Faculty Chair.
Prof. G.B. Tangwa, Science Communication & PLUS Faculty Co-Chair.

Translating Research Evidence – The INDEPTH Experience

David Mbulumi[1]
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1INDEPTH Network, Accra, Ghana
[1,2]Vadu Rural Health Programme, Pune, India

Introduction: The capacity of researchers in low income countries (LMICs) to engage the public and policymakers with scientific evidence remains limited. Most research organisations focus on supporting researchers to conduct and publish research. INDEPTH has put research translation as one of its strategic objectives. This paper illustrates how INDEPTH works toward achieving this objective.

Main body : INDEPTH is a network of 49 health and demographic surveillance system sites which longitudinally enumerate life events including births, deaths, causes of deaths and migrations of over 3.8 million people in 19 LMICs.

INDEPTH regularly maps its stakeholders and identifies appropriate channels for engagement with them. Channels that have successfully been used include dissemination meetings, public exhibitions, systematic reviews and briefs; books, journal publications, reports; and newsletters reaching over 6000 individuals. Case studies are also developed to show the impact of INDEPTH activities on policies, practices and scientific development.

INDEPTH effectively uses its website1, which has a monthly average of 10,000 visitors. Activity on social media has been prioritised, with Twitter attracting an average of 34 new followers every month. NDEPTH has an open online platform2 that displays vital statistics generated from its centres which provides information that can guide decision-making for policymakers. It also uses its good relations with the media to reach stakeholders with regular press releases and newspaper articles.

To encourage dialogue and information sharing, INDEPTH organises national forums which bring together policymakers, researchers, media, community-representatives and NGOs. Such meetings have been held in Ghana, India and Tanzania.

Conclusion : To get maximum value from research and justify use of resources, organisations should prioritize appropriate communication of findings and engage stakeholders as is the case with INDEPTH.

[1]www.indepth-network.org
[2]www.indepth-ishare.org and www.indepth-ishare.org/indepthstats/

Oral Presentation Submission under Theme 3 (a)

Title: Scientifying Villagers or Villageizing Scientists: A false disjunctive dichotomy in the communicational Conundrum

Author: Godfrey B. Tangwa, PhD

Institutional Address: Cameroon Bioethics Initiative (CAMBIN), P.O. Box 31489, Yaounde, Cameroon

Introduction: The problem of communicating scientific information to the general public and the learning and understanding of science by lay individuals has been well recognized and is in fact the subject of a memorandum of understanding (MOU) between the Global Emerging Pathogens Consortium (GET) and the Pan-African Network for the Popularization of Science, Technology and Science Communication (African Gong).

Main Body: On the face of it, the problem of public learning and understanding of science, at bottom, arises from either the inability/failure of scientists to communicate in a language accessible to the general public or from the inability/failure of ordinary people to comprehend scientific language. It may therefore seem that the solution to the problem lies in either scientists adopting ordinary language in communicating science or in the general public learning and using scientific language. But the disjunction is false if not taken in the inclusive sense, inasmuch as it can be demonstrated that both disjuncts are indispensable for achieving the aim of public learning and understanding of science, without which the fruits of science remain elusive for any community.

Conclusion: In this presentation I propose to demonstrate the elusiveness and incomprehensibility of scientific/academic language for ordinary people as well as the compelling nature of technical scientific jargon for experts and specialists. Taking illustrations from the informed consent information of some scientific protocols as presented to ethics review committees and from this very abstract, and drawing inspiration from Bertrand Russell and Ngugi wa Thiong'o on why difficult and incomprehensible language may come to be preferred to simple straightforward language, I argue both that, for ordinary lay people to learn and understand science, they need to attain a certain minimal level of literacy while scientists need to avoid technical language and scientific jargon when communicating with the general public.

Science Communication and public learning and understanding of Science (PLUS) Theme
Oral presentation on
Title:Embracing the missing imperative? Strengthening Africa's efforts in the health and security nexus, by Alice Aghenebit-Mungwa,Political Analyst, New York, United States.

This paper summarises research which shows that weak policy and governance environments are among the drivers and unintended enablers of the spread of pandemics which constitute a permanent nightmare in the health-security nexus in Africa. Yet, due to their multiple and almost intractable nature, policy and governance deficits may be eluding necessary and meaningful during and after pandemics, but may also be enjoying unintended protection by victims due to weak communication and public understanding of science in most countries.

The paper shows that sexual violence and exploitation, for instance, is a rampant weapon of war nearing pandemic proportions, with life-long consequences for victims and society in Africa. It involves a blurry rainbow of perpetrators, drivers, victims and perhaps enablers, sometimes inextricably connected and identifiable by the knowledge and tools offered by science, but this is hardly the case, for different reasons, though a related body of policy is however growing in Africa. More generally, as seen in the recent Ebola outbreak, challenges in the health-security nexus expose deep vulnerabilities in socio-political and economic system in affected countries and regions, leaving them weakened and scared in various ways. Thus, enhanced communication and public understanding of science is imperative for a viable and effective African response to such abuse, failing which the victims risk suffering a life-long double jeopardy due in great part to social rejection.

The paper concludes that beyond the response to sexual violence and exploitation, science communication and public learning and understanding of science must remain integral and central to Africa's response to the challenges it faces in the wider health-security nexus.

Presenting Author: Adeyeye Peter Olusegun
Co-author: Michael Falade
Abstract Track: Strengthen evidence base through sharing of research, information and Capacity Building
Preferred Presentation Type: Oral

Title: How do Residents of Ebola Affected Areas Perceive and Respond to Ebola Virus Disease? An Urban Attitude Survey in Lagos, Nigeria

Ebola virus disease is a dreaded public health concern globally. The incidence of the disease in West Africa in 2014 was not only unprecedented but of high magnitude spreading to Lagos. The study was conducted in the heat of the epidemic and sought to understand public perception and response mechanism.

A total of 206 respondent were randomly selected through a quantitative, cross sectional research design across 10 local government areas in Lagos. Interview was conducted by expert researchers using a structured questionnaire. Data was analysed with SPSS 16.0 Findings showed high knowledge with 92% knowing EBV can spread through direct contact with body fluid of infected person, indirect (84%) contacts, and can be transmitted by non-human primates (88%). Hygiene level improved among participants with 9 in every 10 practicing regular hand washing as opposed to 50% that does that before the advent of the disease. 7 in every 10 persons were aware of isolation centre for Ebola patient albeit only 28% were aware of the hotlines for emergency response.

Findings also showed the presence of superstitious beliefs as 30% believed EBV was caused by sin and pious religious followers cannot be infected (22%). More than half (57%) do not mind been quarantined if suspected and one-quarter proposed that government banned bush meat. The Chi-square test showed that religion, education and place of residence exert significant influence on their knowledge. The study raised need for a follow-up study on hygiene level and emergency preparedness since the curtailment of the disease.

Title: Infectious Diseases and Just Healthcare Access: An African Ethical Framework for Policy Reform

Author: Samuel Ujewe, PhD

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Thematic Area: Science Communication and the Public Learning and Understanding of Science (PLUS)

Mode of Delivery: Oral Presentation

World health statistics show that infectious diseases constitute about half of the leading causes of mortality in Africa. The persistence of diseases like malaria in tropical Africa, and the re-emergence of epidemics like Ebola in West Africa and Yellow Fever in Central Africa, reaffirm the statistical evidence. It is also shown that certain population groups around the continent are disproportionately more vulnerable than others in fighting such infections, and less capable of containing outbreaks. For instance, the recent Ebola epidemic was concentrated in rural areas and poorer suburbs in the affected countries. And while Africa bears over 25% of the global burden of disease, financial commitment to healthcare amounts to less than 2% of the total global expenditure.

The foregoing indicates either or both of two problems: a) that healthcare resources are not proportionate to the populations' needs; and/or b) that distribution of healthcare is not informed by an appropriate framework justice. Improvement strategies employed thus far have focused on practical and tactical approaches, overlooking the underlying ethical dynamics of the situation. Yet, while justice obliges us to pursue fairness in the distribution of healthcare, policy needs the guidance of ethics to determine what this obligation means – as Norman Daniels would affirm.

This paper shall outline the foundational principles of African Justice. Against this background, it will establish an African Ethical Framework for estimating or evaluating effective interventions strategies for curbing infectious diseases in the sub-continent. It will forestall a specific African approach towards the just distribution of and access to healthcare resources and services among the varying population groups. The established framework can inform ethical reforms in the policy process for African health systems.

Knowledge, Beliefs and Malpractices regarding Prevention of Ebola Virus Disease in A Rural Community of North Western Nigeria

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***Corresponding Author: Dr. A.A. Gobir E-mail- aagobir@yahoo.co.uk**

Background: Due to the scale, duration and the lethality of the Ebola Virus Disease outbreak in West Africa, it generated a high level of public fear and anxiety with resultant misconceptions and malpractices regarding its prevention. This study assessed the knowledge, beliefs and malpractices regarding its prevention in a rural community of North -Western Nigeria.

Methodology: A cross-sectional descriptive study conducted during Community Diagnosis practical field posting of trained final year medical students of Ahmadu Bello University, Zaria, from 6th-31st October 2014. Structured, pretested Interviewer administered questionnaire was used to collect the data, which was cleaned and analyzed using Statistical Package for Social Sciences version 21.0.

Results: Most of the respondents (83.2%) were farmers and a majority of them (53%) had no formal education .Awareness about EVD was good (96.7%) but a majority of the respondents do not know symptoms of EVD like gastrointestinal bleeding (70.1%) while 23.3% bathed with or drank salt water as a preventive measure against EVD. There was a statistically significant association between level of education and participation in salt-related malpractices for prevention of EVD (P=0.002).

Conclusion: The result indicated that knowledge about EVD was poor among respondents and there were negative beliefs, misconceptions and malpractices regarding its prevention. For effective control of future outbreaks , there is need for the community to be properly educated on EVD. The health education can be conducted using phones, social media and Radio, especially two-way radio programmes. Findings of the study may also apply to other rural, agrarian communities in the region.

Key words: Ebola Virus Disease, prevention, misconceptions, Malpractices, Taban Sani, Nigeria .

Oral presentation / Science Communication and the Public Learning and Understanding of Science

Africa and Latina America: rebuilding old bridges through science communication

Andre Ramos
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Universities are privileged places that generate scientific innovation. The world of science, however, is inaccessible to the marginalized. Approaching the two ends of this continuum benefits all parts involved, who can teach and learn mutually thereby promoting human development. African and Latin American (LA) nations share numerous historical and social elements. Yet, concrete cooperative actions are incipient.

The present report describes the progress of our search for cooperation opportunities between the Imagine Project, which takes scientific knowledge to communities with little access to science education, and different African partners. A network was established following a round of prospective missions to Morocco, Angola and Mozambique. Afterwards, a grant proposal was prepared in three languages and applications started to be submitted, so far unsuccessfully, a fact that has limited our initial field actions to LA. In Morocco, after reciprocal visits, a memorandum of understanding was signed with the University Hassan II in Casablanca. Ongoing negotiations are being made with the University José Eduardo dos Santos in Angola and the Ministry of Science and Technology of Mozambique, where the Coordinator of the Imagine Project participated as a guest speaker at the National Science Fair. During that visit, several promising contacts were created with high-school and undergraduate students who felt highly stimulated and have already started to work in collaboration with the Imagine team.

A range of common interests exist between LA and Africa that need to be stimulated in order to create the conditions for more consistent scientific cooperation between regions. One such initiative is the creation of a science communication competition involving graduate students from LA and Africa, which is expected to be launched in the second semester of 2016.

Oral presentation / Science Communication and the Public Learning and Understanding of Science

Reaching the marginalized: the example of an inclusive scientific communication program

Andre Ramos, Paulo Hofmann, Guilherme Razzera, Eloisa Pavesi, Áurea Elizabeth Linder, Carlos Rogerio Tonussi

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Rural children spend less time in school than children from urban districts. This deficit increases in poor households and is higher in native ethnic groups. Such education inequalities reinforce the vulnerability cycle and the belief that there is a fundamental distinction between the nature of different ethnic groups, which leads to prejudice and discrimination. The dialogue between local cultures and science brings people to acquire knowledge, gain power and respect differences among individuals, cultures and ethnicities.

The Imagine Project aims at the scientific inclusion of youth from different partner countries, by taking scientific knowledge to rural communities with little access to science education. Our principles are: interdisciplinarity, respect to local cultures and sharing of experiences between scientists and marginalized citizens. The project includes three modules: "DNA, diversity and heredity" , "Energy" and "Medicines: how do we know they are good for us?". They have been all executed in secondary schools of different regions, such as Coxilha Rica, the Guarani Tekoa'Uy'A Village (both in SC, Brazil) and the rural region of Calca, Peru. This report presents results from all modules, which lasted 5 days each. Several scientific activities were developed including experiments on molecular biology, engineering and pharmacology. Video recordings allowed the production of several documentaries. The strategies used allowed discussions on biological and human diversity, renewable sources of energy and the toxic and/or therapeutic effects of drugs and medicinal plants.

The students from all regions responded very well, showing great interest and curiosity. Educational tools are being developed and made digitally available in three languages as Open Educational Resources (https://projetoimagine.ufsc.br).

Ebola Vaccine Faculty

Welcome Message

The use of vaccines as a public health strategy is one of the greatest innovations of all times in medical and health sciences. Vaccines directly combat disease, and vaccination programmes provide a platform for broader health services. With these facts in mind, the Vaccine Faculty of this Conference has put together an innovative programme to not only show case ongoing Ebola vaccine activity in Africa, but highlight practical guidance on the use of Ebola vaccine in an outbreak response and the Gavi investment case in Ebola vaccines.

Recognising the need for a vaccine strategy for the Ebola belt of Africa, we would like to highlight the recommendations of the Strategic Advisory Group of Experts on Immunisation (SAGE); the principal advisory group to the World Health Organization (WHO) for vaccines and immunisation. Based on the review of data available by October 2015, SAGE made the following provisional recommendations, which would "be reviewed and revised in light of emerging data from different Ebola vaccines:

- Vaccination during outbreaks should be part of an integrated strategy and complement other public health measures to interrupt transmission. It does not substitute for full-time personal protective equipment use, contact tracing and other infection control measures.
- The main objectives for vaccination are interruption of transmission and individual protection for those at high risk for infection during an outbreak.
- Health-care workers, as well as certain other categories of individuals with high likelihood of exposure to infectious body fluids, including informal health-care providers and those involved in funeral rites, are at higher risk for infection than the general population. The categories of front-line workers and other risk groups may vary between communities and should be defined locally.
- The vaccination delivery strategy will depend on the extent of the spread of disease, disease incidence at the time when vaccination is initiated, status of implementation of other control measures, effectiveness of contact tracing, and available supply of vaccine. Regular reviews of the epidemiological data should inform adjustments to the delivery strategies throughout the outbreak. Potential strategies include ring vaccination, geographic targeting of an area (mass vaccination) and vaccination of front-line workers. When more data are available, more precise recommendations on the choice of vaccination strategy will be considered."Weekly Epidemiological Record 2015;90:681-700.

We look forward to engaging with all of you regarding a vaccine strategy for the Ebola belt of Africa. God bless you.

Professor Charles Shey Wiysonge: **Chair, Ebola Vaccine Faculty**

Dr Toritse Orubu: **Deputy Chair, Ebola Vaccine Faculty**

The EBOla vaccine Deployment, Acceptance and Compliance (EBODAC) Project

Valerie Oriol Mathieu
Janssen Pharmaceutical Companies of Johnson & Johnson on behalf of EBODAC, a collaboration between London School of Hygiene & Tropical Medicine, Janssen Vaccines & Prevention B.V., part of Janssen Pharmaceutical Companies of Johnson & Johnson, World Vision Ireland and Grameen Foundation.

The EBOla vaccine Deployment, Acceptance and Compliance (EBODAC) project was set up as part of the Innovative Medicines Initiatives Ebola+ Program. The aim of the project is to develop communication, community engagement and technologies to support clinical trials and maximize the impact of a future potential Ebola vaccination program, using heterologous prime-boost vaccine regimen.

EBODAC is currently supporting the EBOVAC-Salone clinical trial evaluating heterologous prime-boost Ebola vaccine regimen in Kambia District (Sierra Leone). EBODAC is designed to ensure acceptance and adherence to the regimen considering the context of a population badly affected by the Ebola outbreak with limited health care infrastructure and experience of clinical trials, as well as a lack of trust in institutions. All three components of EBODAC are designed to allow scale-up in case a licensed prime-boost vaccine regimen is deployed.

Firstly, a community engagement strategy has been developed for EBOVAC-Salone with social science and community liaison staff collaborating to appropriately engage communities in a clinical trial in the aftermath of a deadly outbreak, and rapidly respond to any concerns that may arise.

Secondly, EBODAC is developing tools to uniquely identify trial participants in order to ensure that the right participants receive both prime and boost vaccines at the right time. Within the EBOVAC-Salone study, a simple biometric identification tool captures fingerprint and iris scans from trial participants at each clinic visit.

Finally, EBODAC has developed a mobile application to send trial participants reminders for clinic visits or informative messages. The application offers opportunities to ensure widespread reach in rural areas and keep participants engaged for the full vaccination program in a deployment setting.

EBODAC has received funding from the Innovative Medicines Initiative 2 Joint Undertaking, a joint undertaking between the European Union and EFPIA, under grant number 115847 (EBODAC).

Durability of immune responses and safety profile of Ad26.ZEBOV/MVA-BN®-Filo heterologous prime-boost Ebola vaccine: data from two Phase I studies

Cynthia Robinson[1], Neil Goldstein[1], Stephan Bart[2], Georgi Shukarev[1], Kerstin Luhn[1], Guillermo Herrera-Taracena[1], Benoit Callendret[1], Macaya Douoguih[1]*, and the EBOVAC1 consortium[†].

[1]Janssen Infectious Diseases and Vaccines; [2]Optimal Research LLC, Rockville, MD 20850, USA

[†]Consortium partners: London School of Hygiene & Tropical Medicine; University of Oxford; INSERM (France)

Introduction: Sustained Ebola transmission over 18 months and reports of viral persistence in body fluids of survivors for up to 488 days (PREVAIL III data) in regions affected by the West African Ebola outbreak highlight the importance of durable immunity in the containment of the virus and prevention of spread. A regional population vaccination strategy utilising a vaccine regimen conferring long-term protection could therefore play an important role in the control of Ebola outbreaks. Safety, tolerability and immunogenicity of heterologous prime-boost immunization regimens using Ad26.ZEBOV and multivalent modified vaccinia Ankara-vectored (MVA-BN®-Filo) Ebola vaccines were investigated in two Phase I studies.

Body of work: Development of Ad26.ZEBOV/MVA-BN-Filo, an investigational heterologous prime-boost vaccine regimen, was accelerated in response to the Ebola outbreak. The regimen is in Phase II and III evaluation across the EU, US and Africa. Preliminary data from two Phase I studies in the UK (EBL1001; n=87) and US (EBL1002; n=128) indicate that robust immune responses are readily induced after Ad26.ZEBOV prime immunisation and further enhanced by MVA-BN-Filo boosting. Importantly, the strong regimen-induced antibody and T cell responses persist up to day 240, the latest time-point analysed. AEs were mild in severity and short in duration. No SAEs related to study vaccines were seen, and no differences in AE patterns post-prime versus post-boost were observed.

Conclusion: Initial results show that the Ad26.ZEBOV/MVA-BN-Filo heterologous prime-boost regimen is well tolerated and elicits sustained Ebola antigen-specific immune responses. Ad26.ZEBOV/MVA-BN-Filo could support a suitable long-term strategy for population vaccination in epidemic regions.

Title: PREVAIL I: A Randomized Controlled Safety and Immunogenicity Trial of Two Different Vaccines Against Ebola Virus

Authors: PREVAIL I Study Team, Liberia

Background: The Partnership for Evaluation of Ebola Virus in Liberia (PREVAIL) is a US-Liberian clinical research partnership launched in 2014 with the goal of testing potential vaccine and therapeutic strategies against EVD. The first trial initiated (PREVAIL I) was a randomized, double-blinded, controlled trial (RCT) in Liberia of two different vaccines with favorable preclinical and phase I testing.

Methods: Adult volunteers $\geqslant$ 18 years of age were randomized 1:1:1 to receive single intramuscular injections of either 2 ml of the ChAd3-EBO-Z vaccine (GlaxoSmithKline), 1 ml of the VSVΔG-ZEBOV vaccine (Merck Sharp and Dohme Corporation/New Link), or a volume-adjusted saline placebo. The ChAd3-EBO-Z vaccine is comprised of a ChAd3 vector with a DNA insert encoding the Ebola GP ($1x10^{11}$ pfu)/mL, whereas the VSVΔG-ZEBOV vaccine consists of a single recombinant VSV isolate in which the gene encoding the G glycoprotein is replaced by the Zaire Ebola GP (ZEBOV) ($2x10^{7}$ pfu/mL). Recipients were assessed at weeks 1 and 2, month 1, month 2 and then every 2 months through 12 months. IgG antibody levels against the Ebola GP were measured using the Filovirus Animal Nonclinical Group (FANG) assay. A DSMB reviewed interim results.

Results: From February through April, 2015, 1,500 volunteers were enrolled at Redemption Hospital in Monrovia, Liberia (500 per group). Median age of enrollees was 30 years (37% female). 1.2% of vaccinees in either vaccine group compared with 1.6% of placebo recipients experienced an SAE, predominantly malaria. Injection site reactions were common: 28.5%, 30.9%, and 6.8% for ChAd3-EBO-Z vaccine, VSVΔG-ZEBOV vaccine, and placebo recipients, respectively. Almost all AEs were $\leqslant$ grade 1 and resolved at month 1. At month 1 the median (IQR) antibody levels for the ChAd3-EBO-Z and VSVΔG-ZEBOV groups were 630 (351-1227) and 1090 (591-2030) EU/ml, respectively, compared to 79 (45-133) EU/ml in placebo recipients.

Conclusions: Both vaccine candidates studied in this RCT appear safe, well tolerated, and immunogenic. Longer-term (Month 6 and month 12) antibody levels are being analyzed and will be presented in September.

The EBOla vaccine Deployment, Acceptance and Compliance (EBODAC) Project
Valerie Oriol Mathieu

Janssen Pharmaceutical Companies of Johnson & Johnson on behalf of EBODAC, a collaboration between London School of Hygiene & Tropical Medicine, Janssen Vaccines & Prevention B.V., part of Janssen Pharmaceutical Companies of Johnson & Johnson, World Vision Ireland and Grameen Foundation.

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Durability of immune responses and safety profile of Ad26.ZEBOV/MVA-BN®-Filo heterologous prime-boost Ebola vaccine: data from two Phase I studies **Cynthia Robinson[1], Neil Goldstein[1], Stephan Bart[2], Georgi Shukarev[1], Kerstin Luhn[1], Guillermo Herrera-Taracena[1], Benoit Callendret[1], Macaya Douoguih[1]*, and the EBOVAC1 consortium[†]. [1]Janssen Infectious Diseases and Vaccines; [2]Optimal Research LLC, Rockville, MD 20850, USA [†]Consortium partners: London School of Hygiene & Tropical Medicine; University of Oxford; INSERM (France)**

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Conclusion: Initial results show that the Ad26.ZEBOV/MVA-BN-Filo heterologous prime-boost regimen is well tolerated and elicits sustained Ebola antigen-specific immune responses. Ad26.ZEBOV/MVA-BN-Filo could support a suitable long-term strategy for population vaccination in epidemic regions.

EBOLA VACCINE IMPLEMENTATION: WHO PROVISIONAL RECOMMENDATIONS FOR USE OF EBOLA VACCINES

Charles Shey Wiysonge, Centre for Evidence-based Health Care, Stellenbosch University, South Africa.

Email: charlesw@sun.ac.za (on behalf of WHO and the Global Ebola Vaccine Implementation Team, GEVIT).

Introduction: The World Health Organisation (WHO) has produced draft practical guidance on the use of Ebola vaccine in an outbreak response. The purpose of the guide is to serve as a resource to governments and partners as they plan for use of Ebola vaccine in an Ebola virus disease (EVD) outbreak response. The current draft, dated May 2016, is not for implementation and is being distributed for comment purposes only.

Objectives: The guide aims to: improve understanding of the technical specificities of Ebola vaccines and the possible strategies for outbreak response vaccination; guide global partners and countries on preparedness plans to facilitate rapid vaccination response activities in the event of a future Ebola outbreak; assist countries in the decision-making process regarding use of Ebola vaccine in the event of an outbreak; and guide countries on the steps that will be required to utilise Ebola vaccines during an Ebola outbreak.

Methods: The document is the result of the collaborative efforts of the Global Ebola Vaccine Implementation Team (GEVIT) which associates representatives from countries most affected by the 2014/2015 EVD outbreak (Guinea, Liberia, and Sierra Leone) and from the Bill & Melinda Gates Foundation; United States Centers for Disease Control and Prevention; Gavi, the Vaccine Alliance; United Nations Children's Fund; United States Agency for International Development; and WHO.

Content: The guide is not intended to be a prescriptive methodology. This current version focuses specifically on areas where Ebola vaccination activities differ from other outbreak response vaccination activities and should be read alongside the WHO Ebola Strategy, Ebola and Marburg virus disease epidemics: preparedness, alert, control and evaluation (August 2014).

It is based on the following assumptions:

- The vaccine will be primarily used in two complementary approaches: protection of high-risk individuals (primarily health-care workers and front-line workers) and specific groups of the general population in the outbreak setting.
- The presentation, as well as instructions for storage, handling and administration of the licensed vaccine to be distributed will be identical to that used in clinical trials at the time this version of the guide was issued.
- The guide will be updated periodically to include additional information on clinical trials and licensing decisions, as well as international guidance on use.

As of July 2016, there is no Ebola vaccine registered for use outside the context of clinical trials or expanded use of an investigational vaccine under exceptional circumstances. Therefore, recommendations for use of vaccines that have governed the development of this version of the guide, will only apply once regulatory authorisation for use outside such settings has been obtained.

Conclusion: A draft of the guidance is now posted on the WHO website for comments. Please send comments before Friday, 30 September 2016. It is available from this link: **http://www.who.int/csr/resources/publications/ebola/gevit-guide/en/**

SPECIAL EVENT ABSTRACTS

GET BOOK PROJECT ABSTRACT

Abstract Submitted By Godfrey B. Tangwa

In December 2013, the worst ever Ebola virus disease (EVD) broke out in West Africa and quickly assumed epidemic proportions. Beginning in Guinea, it quickly spread to Liberia, Sierra Leone, Nigeria, Mali, Senegal, and threatened evolving into a pandemic with cases in the United States of America and Europe. In the face of this urgent and dangerous situation, a group of African medical scientists and allied experts quickly convened a crisis meeting aimed at coordinating an effective local and indigenous response to the EVD and any other future emerging infectious deadly pathogens.

The result was the creation of the Global Emerging Pathogens Treatment Consortium (GET) which, from the outset, realized the need and importance of harnessing indigenous knowledge and experience, of continuous capacity building and of integrating socio-cultural, anthropological, ethical, economic and communicational expertise into its work. The GET started off immediately by conducting research into the possibility of using convalescent blood plasma (plasmapheresis) of Ebola survivors as a cure for the deadly disease, without forgetting that the threats were not limited to human health alone but extended to the entire biological and environmental domains.

This book project plans to tell the story of the EVD and other similar deadly pathogens and the story of the GET consortium in its fight against emerging deadly pathogens, its ambitions for Africa and the world at large, and its challenges and potentialities. The book is conceived as an inter/intra-disciplinary publication with contributions from the background of several disciplinary domains and joint authorship of some chapters by experts from different disciplinary perspectives. It should have a broad appeal across disciplines, from medical science and biomedical research, through research ethics, regulation and governance, science and health communication, social sciences, to the general reader.

At the launching of this book project, we will explain amply the idea and raison d'être of it, highlight its constitutive chapters and authors, its editors, production time-frames, possible readership and efforts at finding a suitable publisher for the book.

EBOLA TV SERIES ABSTRACT

Ebola TV Series Abstract by Hakeem Kae-Kazim

A fertile breeding ground has been created through war famine disease and poverty for the deadly Ebola Virus Disease (EVD) to take hold in the Western Africa regions of Sierra Leone Guinea and Liberia, the lack of local infrastructure has allowed the disease to spread threatening to become a pandemic which will encompass the entire world.

This is where our story begins on the ground in a small village in a quiet corner of Guinea where children are playing and roasting bush meat on a stick around a fire.

The aim of the series is to tell the story of the Ebola pandemic its effects and the fight to contain this deadly disease, through the eyes of several characters that are caught up in the pandemic and who's lives naturally intertwine because of these dramatic events....

We see the events through the eyes of the NGO worker on the ground struggling to understand what is happening at the beginning, the Pathologist who understands the effect this pandemic will have if it spreads to a large urban population, the local Chief who is caught between having to educate his people and traditional cultural values, the survivor who struggles to fit back in to his local society and the head of institutions like WHO.

The power of tv and film is unquestionable in its ability to inform educate and entertain on a mass scale. A series like this told from an African perspective, will not only inform and educate but destroy myths and legends associated with this pandemic and help prepare the continent for any future out breaks of this or other pandemics waiting in the wings.

ANTIMICROBIAL RESISTANCE PROJECT

Abstract Submitted By Maureen Nabila Cowan

Antimicrobial Resistance (AMR), recognized as a severe global biosecurity threat by the World Health Organization, is the phenomenon whereby microorganisms (bacteria, fungi, protozoans and viruses) display reduced sensitivity to the antimicrobial drugs used to treat their respective infections. The overuse and misuse of antimicrobial agents is accelerating this naturally-occurring process, rapidly rendering modern treatments for infectious diseases partially or totally ineffective and resulting in increased or prolonged morbidity or mortality, all while reverting global health security to a pre-1930's era.

Despite the indiscriminate expansion of AMR across regional borders, the severity of AMR as a threat, in terms of the prevalence of multi-drug resistant strains and their corresponding social and economic costs, is expected to disproportionately cripple the sub-Saharan African region.

The African sub-region, due to its remarkably high burden of disease and socioeconomic as well as infrastructural challenges, is arguably least equipped to in terms of its ability to initiate and conduct comprehensive infection control, surveillance, and stewardship programs that (1) control internal rates of resistance, and (2) curb both the influx and efflux of resistant strains across national and regional borders. Furthermore, issues of AMR are expected to become amplified, particularly due to existing regional HIV and TB epidemics.

While several African countries have recently joined multi-sectorial partnerships aimed to fight AMR such as the Global Health Security Agenda (GHSA) and Global Antibiotic Resistance Partnership (GARP), the extreme dearth of surveillance data recorded from the region, as well as economic and human resources occupied by more immediate threats such as HIV/AIDS and Tuberculosis, make such initiatives difficult.

In light of these challenges, GET aims to (1) evaluate the unique ecological, biomedical, and socioeconomic factors underpinning AMR as a threat to the African continent; (2) further assess AMR's current and future economic impact to the region; and (3) develop a general strategy framework that addresses AMR within the context of Africa's more immediate ongoing pathogen threats to protect and promote regional biosecurity.

Note

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