



WRaP-Up

Marching towards a HIV/AIDS free future

Walter Reed Program Nigeria

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Newsletter of U.S. Department of Defense Walter Reed Program-Nigeria (DoD WRP-N)



FOREWORD

As the fiscal year comes to a close, the military to military partnership reflects on the past 12 months to look at our successes, challenges and way forward.

The Walter Reed Program-Nigeria (WRP-N) saw significant growth in program activities and added a new component, spearheaded by headquarters leadership, known as the Joint West African Research Group (JWARG). In addition to JWARG, the partnership is initiating a second Ebola vaccine trial, and a malaria slide bank protocol to improve diagnosis, quality assurance and operational studies supported by PEPFAR.

JWARG focuses on co-infections and scientific information on program metrics preparing for a

bioresponse capability to detect, provide surveillance and respond to future infectious disease outbreaks that affect the military and the communities in which they serve.

In missions all around the country and sub-region, the Nigerian military medical corps continues to respond to the call of duty, while the government manages a significantly reduced budget due to the devaluation of the Naira, resulting from lower prices and production of crude oil. Notwithstanding, the NMOD Health Implementation Programme (MOD HIP) remains an example of efficiency under a strong unity of command by ensuring that the soldier and Nigeria can rely on a force that is taking on the many

challenges presented today. The enduring military to military partnership between Walter Reed and the Health Implementation Programme has a bright future and is poised to continue to succeed in their ongoing and future missions, some of which are summarized in this newsletter.

Thank you for your continued support of our partnership.

- Robbie Nelson
Country Director
WRP-N

The enduring military to military partnership between Walter Reed and the Health Implementation Programme has a bright future and is poised to continue to succeed in their ongoing and future missions.



From left: Mr. Robert Nelson, WRP-N Country Director, Brig. Gen. NA Hussain, HIP Director; and Mr. John Bray, U.S. Consul General

Moving up with Research Studies

RV 456e Ebola Vaccine Research

RV 456e Protocol is a randomized, observer-blind, placebo-controlled, two-part, phase 2 study to evaluate the safety, tolerability and immunogenicity of two prime-boost regimens of the candidate prophylactic vaccines for Ebola Ad26.ZEBOV and MVA-BN-Filo (VAC5150EBL2003).

The objective of this study is to assess the safety and tolerability of different vaccination schedules of Ad26.ZEBOV and MVA-BN-Filo vaccines and to evaluate its immune response to the Ebola vaccine. These vaccines are expected to stimulate the body's immune system and provide protection against infections with the Ebola virus. A total of 575 volunteers will be enrolled in this study which will be conducted in Nigeria, Kenya, Uganda, Tanzania, Mozambique and United States of America. The Walter Reed Program-Nigeria's Clinical Research Centre in Abuja will enroll 50 healthy volunteers including persons living with HIV.

This is the second of the studies on Ebola vaccine to be conducted by the NMOD/USDOD Program as part of its efforts toward preparedness against infectious disease outbreaks. The Ebola epidemic hit Nigeria in 2014 and the NMOD/USDOD Program has been at the fore-front to find lasting solutions to infectious disease outbreaks in the region and also to advance research studies.

RV 429 Ebola Vaccine Research

RV 429 Protocol is a Phase 2, randomized, observer-blind, placebo-controlled, multi-country, cross-over study which has entered its second stage of implementation. This second

stage involves follow-up of all study participants and administration of vaccine to those who had received placebo at commencement of the study.

The 12 months study is investigating the safety and immune response of African adults to the Type 3-vectored Ebola Zaire vaccine. Nigeria is contributing 330 volunteers to the research pool which is being conducted by the Walter Reed Program-Nigeria.

Tracking

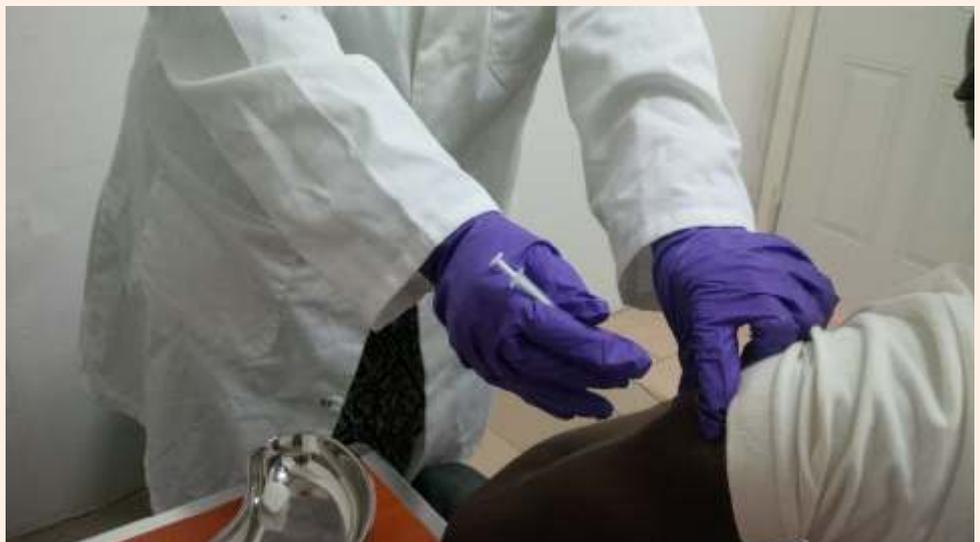
Tracking involves a continuous follow-up of study participants who have missed their appointment or cannot be reached on phone. Since the successful close of the first phase of the Ebola vaccine research study, the Community Engagement team of the Clinical Research Center has been on the heels of study participants to locate them and track their general well-being. This is not an easy feat in this terrain where addresses are not clearly defined or allocated. By the end of the first quarter of the year, all registered participants for the vaccine study had come for their scheduled month-6 visit and were unblinded (in revelation of the type of vaccine administered to the study participants).

A meeting with few study participants during the second phase initiation showed that they were well, comfortable and happy to continue participating in the study.

As the program moves towards investigative discoveries in the area of public health, research studies are the tools which will help mitigate infectious diseases outbreaks towards securing a healthy global world.

Development of Malaria Slide Bank for External Quality Assessment Training

The NMOD/USDOD Program has commenced preparations for another research study. The aim of this study is to determine the accuracy of the Malaria Rapid Diagnostic Test (MRDT) currently used in public sector clinics and hospitals. The study also aims to develop a specimen bank of validated, fixed, stained and preserved blood smears for training, testing, and quality assurance/assessment of microscopic malaria diagnosis in Nigeria. This study will be conducted in six NMOD/USDOD Program sites and will enroll about 300 participants.



PEPFAR: CLINICAL

District Health Information System (DHIS)

The NMOD-USDOD Program has successfully implemented Programme Health Information Management System (ProHIMS) using DHIS2 in its Program sites.

In a two-week training in May 2016, data officers and site managers from all of the Program's comprehensive and selected satellite sites were trained on effective use of the DHIS2. The DHIS2 was developed primarily to serve in the area of aggregating health information and data on a very large scale. DHIS 2 enables users to collect, manage and analyze transactional, case-based data records.

The Program has since then adopted the use of the DHIS2 for data management in the Program and subsequently, data reporting has become automated. Benefits from this innovative venture include: decreased transcription errors, improved reporting rates, and improved quality of program data.

Additionally, it has led to improved data management as site staff and Programme managers can now access data in real time and observe important trends which aid in decision making.

- Navy Lt. C. Eneja



IGA at Program Sites

The USDOD Walter Reed Program- Nigeria and the Health Implementation Programme (DOD WRP-N/MOD-HIP) has once again improved health outcomes in its Program sites with the provision of items that will generate income for People Living with HIV (PLHIV) - Income Generating Activities (IGA). In May 2016, USDOD WRP-N/MOD HIP procured office furniture for its supported sites and support group offices. These support groups provide avenues for rehabilitating and supporting clients to have a sense of belonging and sustainability. 12 sites benefitted from this project aimed at improving the quality of clinical care given to its clients and ensure effective service delivery in the sites. Items donated include tables, chairs, bookshelves, fans and other equipment such as sewing machines and hair dryers which will improve the quality of services accessed by HIV patients at the facility.

Program activities continue with monitoring and standardization of site activities through SIMS (Site Improvement Monitoring System) visits.

- Dr. Ismail Lawal
Esther Essien

LABORATORY

Equipment Update at DRL

The NMOD/USDOD Program has upgraded its equipment at the Defense Reference Laboratory Abuja with a new Liquid Nitrogen Generator (LN2) M280X2. This is another feat for the Program, as it is the first non-governmental organization to own and provide this service in Nigeria. The LN2 M280X2 is of a higher capacity in comparison to the existing ones (NL280). The plant has the capacity to generate 80 litres of liquid nitrogen per day. This liquid nitrogen is used for preservation of human samples in all research studies of the Program. At a temperature of -196

degree centigrade, human samples can be stored and preserved for many years. The LN2 has been installed and commissioned and will serve as a biorepository for all military hospitals, research facilities and beyond.

Ola Olabulo



Common Malaria

Malaria is a major public health problem in the world where at least 3.2 billion people are at risk of contracting the disease annually. The World Health Organization (WHO) estimates that 90% of malaria deaths occur in Africa. Parasitological confirmation is a key component in the case management of malaria and WHO currently recommends that parasites must be demonstrated in blood before treatment is instituted. Rapid Diagnostic Tests (RDTs) have recently been introduced to supplement malaria diagnosis in areas where microscopy is not available, however, their use is limited when fever is due to causes other than malaria, and for follow up of patients after treatment. Microscopy-based diagnosis of malaria still remains the gold standard for species identification, parasite quantification, management of severe and complicated malaria, and assessing therapeutic efficacy of anti-malarial drugs. The quality of microscopy is frequently inadequate, as many fail to accurately detect malaria species to ensure good health outcomes and reliable research findings.

Early diagnosis and prompt, effective treatment remain key for reducing malaria mortality and morbidity. To strengthen the capacity of laboratory workers for quality malaria diagnostic services in Nigeria, the Department of Defense Walter Reed Program Nigeria (DODWRPN) in collaboration with Amref Health Africa conducted an External Competency Assessment of Malaria Microscopists (ECAMM) course for twelve microscopists. The primary aim of malaria microscopy quality assurance (QA) programmes is to ensure that microscopy services

are delivered by competent and motivated staff, supported by effective in-service training and supervision that maintains a high level of staff competency and performance. This requires regular, comprehensive malaria microscopy refresher training programmes supplemented by competency assessment and certification of malaria microscopists. The five-day ECAMM course aimed to establish core national and regional experts in malaria microscopy to promote the implementation of quality malaria



diagnostic services in Africa. The assessment is in line with the National Malaria Strategic Plan 2020 whose overall policy objective is to strengthen Nigeria's health system for provision of effective, efficient, quality, accessible and affordable health services through continuous training of malaria microscopists for accurate parasitological confirmation of malaria infections. Participants at the end of the training were expected to identify and quantify all malaria parasite stages and be capable of differentiating pseudo-parasites and artifacts from true malaria parasites. They would also improve on developing and maintaining Standard Operating Procedures (SOPs).

“Common malaria”, as popularly called in Nigeria, is a deadly endemic disease with an estimated 100 million malaria cases and about

300,000 deaths each year. Nigeria has a population of about 172 million and according to the Nigerian National Malaria Strategic Plan 2014-2020, malaria is responsible for 60% of outpatient visits to health facilities. The geographic location of Nigeria makes the climate suitable for malaria transmission throughout the country. The dominant malaria vector species in Nigeria are *Anopheles gambiae* and *Anopheles funestus*. *Plasmodium falciparum* is the most prevalent species (95%) of malaria parasites in Nigeria which is responsible for the most severe forms of the disease. The other types of malaria parasite species found in the country are *Plasmodium ovale* and *Plasmodium malariae*.

The ECAMM assessment conducted in February, marks the third of such trainings in Nigeria. Nigeria through its National Malaria Elimination Program (NMEP) Strategic Plan (2014 - 2020), outlines the provision of a comprehensive package of integrated malaria prevention and treatment services through community, primary, secondary, and tertiary levels. The strategy also defines the roles of each health care worker relative to malaria case management and control across all health care services, including public, private and traditional health providers.

By Patience Udefuna
Esther Essien

THE JOINT WEST AFRICA RESEARCH GROUP (JWARG) IN NIGERIA

Commencement of JWARG



Initial assessment in preparation for JWARG commencement. From left seating: Kara Lombardi, Morgane Rolland, Robbie Nelson and Dr. Julie Ake. From left standing: Dr. Babajide Keshinro, Dr. Kayvon Mojarrad, Mihret Amare, Dr. Diran Akintunde, Tsedal Mebrhau and Dr. Senate Amusu.

The 2014-2015 Ebola epidemic in West Africa revealed both great potential and deep deficiencies within the mechanisms for rapid medical response to public health emergencies. The United States Government dedicated funding for disease control in West Africa and awarded funds to the U.S. Military HIV Research Program. This funding supports laboratory and clinical capacity building through military-to-military collaborations and academia.

The Joint West Africa Research Group (JWARG) was formed to prevent and mitigate the outbreak of infectious diseases by leveraging on existing capacity, coordinate with host nation militaries and in-country partners for health security to develop clinical and laboratory capacity, bio-surveillance and response capabilities, as well as evaluate infectious diseases counter measures in Nigeria, Ghana, and Liberia.

JWARG, in partnership with U.S. Department of Defense Walter Reed Program-Nigeria (WRP-N), Nigeria Ministry of Defence Health Implementation Programme (MODHIP), international

The Good Clinical Laboratory Practice (GCLP) was the first in the series of JWARG trainings to build capacity of laboratory personnel and prepare West Africa for any infectious disease outbreak. It began on 17 May, 2016 at the 445 Nigerian Air Force Hospital Ikeja-Lagos, Nigeria. Participants were trained on producing accurate lab results, management of data & clinical trials in line with DAIDS-GCLP guideline.



academia, research institutions, the U.S. Navy, Ghanaian and Liberian Armed Forces, have built up comprehensive sites that provide laboratory, clinical and emergency services to military and civilian populations in the communities in which they are located. This sustainable platform will be used to build countermeasures to respond to infectious disease crises. Already, a series of trainings have been lined up to enhance this objective in Nigeria. These trainings are aimed at building the capacity of partners from the West African states of Nigeria, Ghana and Liberia in laboratory and clinical courses: Good Clinical Laboratory Practice, Malaria, Infectious diseases and Quality Assurance.



JWARG was officially launched in Lagos, Nigeria on June 23, 2016 by the U.S. Embassy Deputy Chief of Missions, Mrs. Maria Brewer and the Nigerian Army Medical Corps Commander, Maj. Gen. TA Amusu. From left; Lt Cdr. E. Sarkodie (Ghana); John Bray, U.S. Consul General; LTC Jule Ake, Deputy Director MHRP; DCM; Maj. Gen. Amusu; MODHIP Director, Brig. Gen NA Hussain; WRP-N Country Director, Robert Nelson and Lt. Y. Kesselly (Liberia)

The Malaria microscopy and diagnosis segment of the JWARG training kicked off on June 5, 2016. The two-week training had 15 participants in attendance. It aimed at training laboratorians to accurately identify and diagnose malaria organisms according to WHO standards.



Editor's note

The USDOD Walter Reed Program-Nigeria and its partner, the Nigeria Ministry of Defence Health Implementation Program, have been setting the pace on how two countries and particularly how two militaries - Nigeria and USA, can impact lives through public health delivery. Spanning clinical care, research, biosurveillance, and collaborative efforts within the West African region, shows clearly that this military to military partnership is truly a model!

- Editor

One on one with Jennifer Malia

Captain Jennifer Malia is the Deputy Director, Department of Laboratory Diagnostics and Monitoring, a part of the Military HIV Research Program in Maryland, United States of America. She has her doctorate in Public Health and is a Captain in the U.S. Public Health Services. She was in Nigeria on a site visit to 68 Nigerian Army Reference Hospital Yaba and also to represent the Deputy Director, MHRP and Head of the JWARG, Dr. Julie Ake, in the JWARG Chemistry and Quality Assurance training. Her main goal of visiting 68 Yaba was to initiate a research protocol and to evaluate a molecular device called IBIS. This device looks at respiratory panels and how it compares to the gold standard. Her second mission was to participate and facilitate the JWARG course. Here is what she said of the Chemistry and Quality Assurance training.



"The training is going very well. I'm very excited about the group that is here. The facilitators are excellent as well as the team that is helping in facilitating the training. The laboratorians that are here are very knowledgeable. There is a lot of interaction going on between the facilitators and the group, it's very nice to see".

JWARG's Clinical and Infectious Disease training commenced from the 20 to 24 June, 2016. This training for clinicians brought together over 40 participants from all over the world including U.S, Ghana, Liberia and U.K. It concentrated on new infectious diseases and its management, especially Ebola and Lassa Fever.



The 4th JWARG training - Chemistry & Quality Assurance was held from 22 to 26 August, 2016. It equipped laboratorians with essential skills in performing accurate assays, lab safety, standard methodologies, equipment maintenance, logistics and record keeping.



PEOPLE & EVENTS

Program activities



DCM David Young (3rd from right) with Senior Management Team. From left is Dr. Yakubu Adamu, WRP-N PEPFAR lead; DAO, Mr. Eddie Bloom; U.S. Defense Attache, COL Patrick Doyle; Dr. Tiffany Hamm, Director, Global Health Programs; WRP-N Country Director, Mr. Robert Nelson and Dr. Jide Keshinro, Director, Research

The Deputy Director of PEPFAR and Global Health Programs, Military HIV Research Program (MHRP), Dr. Tiffany Hamm, visited the USDOD Walter Reed Program-Nigeria in September, 2016. Her visit coincided with the new U.S. Embassy's Deputy Chief of Missions' (DCM), Mr. David Young's visit to the Program. The DCM who assumed office in September 2016 was on a familiarization visit to WRP-N where he pledged his support to the Program. Afterwards, the DCM, joined by Dr. Hamm, presented awards to HJFMRI long serving staff members. Dr. Tiffany was visiting the Program once again to monitor and harmonize PEPFAR and global health activities at the Program sites.



DCM Young (center) and Dr. Hamm (2nd left) in a group photograph with WRP-N team

An awardee, Mr. Bege Dogonyaro posing with the DCM and Dr. Hamm

Award ceremony

It was celebration time for members who have time to service in the Program-Nigeria. The first the Program since its 2004, awards were WRPN/HJFMRI personnel their long service and commitment to the Program. All awardees earned recognition of 8 years service except for David Fasanya, Finance Officer and Dr. Babajide Keshinro, Research Director (1st & 2nd, 1st row) who have 7 years. Others are (from 3rd, 1st row) Dooshima Uganden, Prevention Officer; Suleiman Aminu, PEPFAR Lab. Manager; Amaka Ajiboye, HR Manager; Emmanuel Shekari, Warehouse Assistant; Funke Opashina, Finance Manager; Zubairu Elayo, Program Logistician; Treasure Okoye, PMI lead and Bege Dogonyaro, Lab. Facilities Supervisor (inset in photo above).



Welcome

Funsho Odewoye joined the Walter Reed Program-Nigeria team in March 2016 as a Finance/Budget analyst. He is a Fellow of the Institute of Chartered Accountants of Nigeria (FCA), an Associate of the Chartered Institute of Taxation of Nigeria (ACTI) and a Certified International Financial Reporting Specialist (IFRS). He holds a Bachelor Degree in Accounting and a Master Degree in Business Administration and Management, both from University of Ilorin, Nigeria. He is joining USDOD with over 13 years cross functional hands-on experience in Banking, Audit, Tax and Financial Advisory Services. Prior to joining USDOD, he was the Divisional Head, Tax & Financial Advisory Services at WFO Rodl & Partners. Funsho has won many awards for exceptional performance from previous organizations.



Dr. Stanley Chukwudi Meribe is the new Senior Program Specialist, TB-HIV who assumed office in July 2016. He is a medical doctor and holds a doctorate in HIV/AIDS Research, majoring in viral-immunology and molecular epidemiology from Kumamoto University, Japan. He has worked for close to ten years in different institutions including the Lagos University Teaching Hospital (LUTH), and lastly, at the Institute of Human Virology, Nigeria (IHVN). His experiences span through clinical pathology and Infectious diseases, health programming, general and tropical medicine. Stanley is married and a proud father to a little girl. He enjoys swimming, soccer, and volleyball.



Jennifer Ogu assumed office as the new Human Resources/Admin. Assistant in May 2016.. She has a first degree in Law from the University of Benin and a Master's degree in Human Resource Management from Robert Gordon University, Aberdeen-Scotland. Jennifer is a member of many professional bodies, including the Nigerian Bar Association and the Chartered Institute of Personnel Development (UK). She started her career as a legal administrator with Awakalu (SAN) and Associates and subsequently diversified into HR/Administration where she has gained a wealth of experience working in both private and public sectors. Before joining the Program, Jennifer worked with Jubaili group. Her hobbies include traveling and swimming.



Obinna Ejekam joined the Walter Reed Program-Nigeria team in August 2016 as a chauffeur. Obinna's has working experience of over 6 years in vehicular maintenance and engineering. He has worked in several organisations including' CenTokyo Automobiles, Abuja. His last organization before joining WRP-N was Hardex Automobile Industry. Obinna is a soccer fan and has interests in Infotech and computer engineering.



Team spirit in action. Eddie Bloom, WRP-N DAO (center) and Jovi Chijioke-Eze pose with Motorpool team

For more information; visit our website at www.wrp-n.org
We welcome your contributions/comments at eessien@wrp-n.org or wrpncommunication@gmail.com

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A day with Prof. Christian Happi

In May 2016, Prof. Christian Happi made a one-day visit to the U.S. Embassy to discuss a new research project. He was welcomed by the management and staff of WRP-N. At an all-hands meeting, Prof. Happi took the floor to talk about his professional experience, his academic organization and their medical accomplishments. Prof. Happi is a renowned scientist who has led his team to make critical medical discoveries in West Africa. Prof. Happi's interaction with Walter Reed dates back decades, when he worked with Dr. Sheila Peel. In summer 2015, he met with Colonel Nelson Michael at Harvard where they discussed the creation of the "Joint West African Research Group" (JWARG).

Prof. Happi, heads the African Center for Genomics and Infectious Diseases (ACEGID) in Ede, Osun State which is funded by the World Bank and other stakeholders. With an enrolment of 15 students and in collaboration with the Broad Institute in Boston, the role of ACEGID is to build scientific capacity in Nigeria by applying modern care techniques with next generation sequencing technology for pathogen detection and identification. A major thematic area ACEGID focuses on is acute febrile diseases, which complements the JWARG mission focusing on severe infectious disease surveillance and detection in West Africa. According to Prof. Happi, his role in the partnership is, "to bring in new interactions and new ways of doing things and see how best we can altogether work toward achieving goals of humanity, which in essence is, trying to make our environment, Africa and the world safer through research."

Ebola

During his presentation Dr. Happi spoke about how his team was at the forefront in containing the Ebola crisis. In Nigeria, the first case of Ebola was diagnosed and confirmed in his laboratory through his network and strategies deployed to respond to health crises.

In March 2014, Prof. Happi gathered a team of laboratorians who

developed protocol mechanisms and carried out accurate diagnosis in order to be prepared for an Ebola outbreak. During the outbreak, Prof. Happi and his team played a critical role in the history of science by providing data on Ebola to the international science community before publication so that they would know what characterized the virus that was circulating the region. In a short four months, his team worked diligently to provide a WHO approved rapid test kit that became critical in identifying and providing the tools for containing the Ebola outbreak.

Lassa Fever

Prof. Happi was also instrumental in the surveillance and detection of Lassa Fever. For the past decade in Irrua, he has built a competent team of clinicians and laboratorians who efficiently test for Lassa and assist health officials in managing outbreaks. Prof. Happi recounted the advantages of using sequencing technology which has been useful not only in pathogen identification but in advancing the microgram landscape. The microgram landscape can be used in diagnosing more than one virus at a time. Moving further, he has translated such technology, not only to point of care diagnosis as in Ebola, but also by developing a rapid test kit for Lassa Fever.

Next-gen

Prof. Happi believes Africa has much to offer. He also believes in the next generation of African scientists, who have the opportunity to harness problems and offer solutions to the world. He told us that the goal of ACEGID is to produce within existing resources, "a critical mass of well-trained African scientists that can effectively use genomics technology to create tools which can enable them solve indigenous problems". He believes that his team's platform, in collaboration with the Walter Reed Program-Nigeria, can effectively



Prof. Happi (left) in a handshake with the U.S. Ambassador to Nigeria, Mr. James Entwistle

reach this goal.

Dr. Happi wishes Africans to learn to become problem solvers and, by extension, become solution-providers to the world. He acknowledged that Africa has the potential to be a leader in many aspects. He said that Africa is blessed with human, natural and mineral resources, but is lacking in ingenuity and technological expertise. In addition, Africa is plagued with many problems ranging from diseases, transportation, energy, and war for which the continent should have sought resolutions. His philosophy stems from the fact that, "Africa is blessed not only with resources but also problems. These issues should not be looked upon as problems, but as blessings in disguise which can be tapped into and used to solve the problems of the world".

Dr. Happi traced Africa's problems to ignorance, citing that diseases, which are called "emerging" now, have long existed. The scientific community should rather view public health technologies and strategies to develop "new emerging diagnosis". He was particularly glad of the JWARG initiative, which brings a breath of fresh air by introducing academia into our Military to Military Partnership.

During the outbreak, Prof. Happi and his team played a critical role in the history of science by providing data on Ebola to the international science community before publication so that they would know what characterized the virus that was circulating the region.

Infectious Diseases

PART ONE

Infectious diseases are those diseases caused by micro-organisms such as bacteria, viruses, fungi or parasites. These organisms are found almost everywhere: air, water, soil, solid object and surfaces. Many even live in and on our bodies. Most of these micro-organisms are normally harmless or even helpful to humans but under certain conditions may cause severe diseases which are transmittable. Some micro-organisms are highly pathogenic naturally and if they gain access into human or animal body can cause severe illnesses which could as well be infectious. Human beings contact most of these highly pathogenic organisms from animals which usually have a devastating impact on human health, causing a high disease burden and even mortality. Such diseases are referred to as zoonotic. Zoonotic diseases include monkey pox, hendra virus, nipah virus, and severe acute respiratory syndrome coronavirus (SARS-CoV). Others are; Lassa virus, influenza A, and the lentiviruses among others. In recent years, climate change, unintended consequences of globalization, and changes in agricultural practices have contributed to the apparent increased transmission of pathogens from animals to humans. Generally, the burden of these diseases is strongly felt by those in developing countries. Every infectious disease has its own specific signs and

symptoms. General signs and symptoms common to a number of infectious diseases include: Fever, diarrhea, fatigue, muscle aches, coughing and rashes:

Mode of transmission

Direct contact

An easy way of contracting infectious diseases is by coming in contact with an infected person or animal. Three ways infectious diseases can be spread through direct contact are:

Person to person: A common way for infectious diseases to spread is through the direct transfer of bacteria, viruses or other germs from one person to another. This can occur when an infected person touches, kisses, coughs or sneezes on someone who is not infected. These germs can also spread through the exchange of body fluids through blood transfusion or sexual contact. The infected person may have no symptoms of the disease, but may simply be a carrier.

Animal to person: Being bitten or scratched by an infected animal, even a pet, can make one sick and, in extreme circumstances, can be fatal. Eating uncooked or undercooked meat from an infected animal, or even mere handling of infected animal waste can be hazardous. For example, you can acquire a toxoplasmosis infection by scooping your cat's litter box.

Mother to unborn child:

A pregnant woman may pass on microorganisms that cause infectious diseases to her unborn baby. Some microorganism can pass through the placenta. Germs in the vagina can be transmitted to the baby during birth.

Indirect contact

Disease-causing organisms can also be transmitted through indirect contact. Germs linger on inanimate objects, such as a tabletop, doorknob or faucet handle. When you touch a doorknob handled by a person with the flu or a cold, you can pick up the germs he or she left behind. If, you then touch your eyes, mouth, or nose before washing your hands, you may become infected.

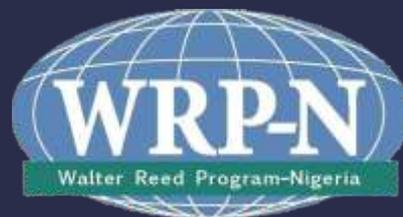
Vectors

Some germs rely on insect carriers, such as mosquitoes, fleas, lice or ticks, to move from host to host. These carriers are known as vectors. Mosquitoes can carry the malaria parasite causing malaria, and deer ticks may carry the bacterium that causes Lyme disease.

Another way disease-causing germs can infect you is through contaminated food and water. This mechanism of transmission allows pathogenic microorganisms to be transmitted to several people through a single source. E.coli, for example, is a bacterium present in or on certain foods such as undercooked hamburger or unpasteurized fruit juice. Salmonella (bacteria which causes typhoid) and vibrio cholera are spread through contaminated water.

In recent years, climate change, unintended consequences of globalization, and changes in agricultural practices have contributed to the apparent increased transmission of pathogens from animals to humans.





WRP-N

Walter Reed Program-Nigeria - an affiliate of Walter Reed Army Institute of Research U.S.A., works in partnership with the Nigeria Ministry of Defence. It is a 'military to military' collaboration to combat HIV/AIDS and related diseases in Nigeria through research, prevention, care, treatment and training.
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