World Health Organization
REGIONAL OFFICE FOR Africa

Report of the Meeting of Heads of Emerging and Dangerous Pathogens Reference Laboratories in the WHO African Region 27-30 May 2013, Harare-Zimbabwe

Meeting of Heads of Emerging and Dangerous Pathogens Reference Laboratories in the WHO African Region 27-30 May 2013, Harare-Zimbabwe

A. Background

The African Region experiences recurrent epidemics of Emerging and Dangerous Pathogens (EDP). Early confirmation of these diseases requires specialized laboratories with appropriate biosafety levels, capacity for accurate diagnosis of emerging viral pathogens and a functional regional network of laboratories to provide service that covers all the countries in the Region. The WHO Emerging and Dangerous Pathogens Laboratory Network (EDPLN) is made up of global and regional EDPLN networks of high-security human and veterinary diagnostic laboratories. EDPLN was established to assist WHO in:

- Enhancing both the readiness and response of countries for timely laboratory detection and management of outbreaks of novel, emerging and re-emerging pathogens;
- Facilitating the transfer of safe and appropriate diagnostic technologies, practices, and training to laboratories in affected countries, as outlined in the IHR (2005).

The WHO Regional Office for Africa established the regional Emerging and Dangerous Pathogens Laboratory Network (AFR EDPLN) in 2010. The network comprises of 13 national EDP reference laboratories in 13 countries, namely Cameroon, Central African Republic, Côte d'Ivoire, Democratic Republic of Congo, Gabon, Ghana, Kenya, Madagascar, Nigeria, Senegal, Sierra Leone, South Africa and Uganda.

Several laboratory networks have been established in the WHO African Region and are operating under different clusters within the Regional Office. These include polio, measles, yellow fever, rotavirus, paediatric bacterial meningitis and EDP networks.

In order to review the progress made on the implementation of actions proposed in Resolutions AFR/RC58/RC6 and AFR/RC59/11 related to strengthening public health laboratories and establishment of centres of excellence, the Regional Office organized a meeting of laboratory networks in Harare, Zimbabwe, from 27 to 30 May 2013.

A joint plenary session of all the laboratory networks mentioned above was devoted to addressing common topical issues related to laboratory services on 27 May 2013, after which specific topics were addressed by each network in parallel sessions from 28 to 30 May 2013 to come up with comprehensive key actions for enhancing laboratory capacity for surveillance and response to priority pathogens.

B. Meeting objectives

The Disease Prevention and Control Cluster (DPC) held the parallel session of the AFR EDPLN from 28 to 30 May 2013.

The general objective of the EDPLN meeting was to contribute to the strengthening of regional capacity for the diagnosis, prevention and control of emerging and dangerous pathogens.

The specific objectives were:

- To share national and regional experiences in the areas of diagnosis and response for EDP;
- To identify issues and challenges for individual national EDP reference laboratories in order to meet the AFR EDPLN terms of reference;
- To develop a two-year plan for operationalizing the AFR EDPLN.

C. Meeting process

Day one of the meeting started with presentations by the WHO Secretariat detailing the meeting goals and the plans for moving forward the operationalization of the AFR EDPLN. This was followed by the EDP reports of experiences and lessons learned by the laboratory network members.

The WHO Emerging and Dangerous Pathogens Laboratory Network (EDPLN): for early detection and rapid containment of EDP outbreaks of the global concern, *Pierre Formenty, WHO*: EDPLN is a network of high-security diagnostic laboratories able and willing to collaborate and share their knowledge, biological materials and experimental research results in a real time framework to detect, diagnose and control novel disease threats. The members include Human and Animal High Security Laboratories BSL-4 and selected BSL-3. EDPLN supports the functions of WHO and GOARN for alert, preparedness and response.

The Defense Threat Reduction Agency (DTRA) is funding a WHO project aimed at supporting EDP safe sample collection and shipment in the Central African region, with special focus on Democratic Republic of Congo and Uganda as well as Gabon, Kenya, Tanzania, South Sudan and South Africa.

Passive immunotherapy with monoclonal antibodies (MAbs) is seen today as the best current method for post-exposure treatment against Ebola. Private companies (MAAP Biopharmaceutical in US and Defyrus in Canada) are producing monoclonal antibodies (MAbs) stocks for post-exposure treatments against Ebola, which could be lifesaving in the WHO African Region, notably for laboratory technicians from EDPLN, health-care workers and patients.

The European Virus Archive (EVA) is a non-profit organization that mobilizes a European network of scientific centres with expertise in virology to collect, characterize, standardize and distribute viruses and derived products. EVA can supply EDP viruses, antigens and reagents at production cost given the fact that the user pays the shipping costs. EVA Supply Pathway can assist the Region in the production of reagents and provide virus- positive controls in the laboratory. Website information link of EVA is provided in the presentation (www.european-virus-archive.com).

The Global Health Security Action Group (GHSAG) Laboratory network (G8 countries) is interested in supporting the AFR EDPLN with human resources and funds and will discuss with WHO when a strategic plan will be made available to them.

Overview of the AFR EDPLN, *Ali Ahmed Yahaya, WHO*

There are recurrences of epidemics of EDP in the Region and all countries are at risk of EDP. Currently, the network is composed of 13 countries.

The establishment of a functional system in the Region, with reliable, accurate and timely diagnosis of EDP at all levels is very crucial. There are plans for harmonization of laboratory techniques for confirmation of EDPs and establishment of the EDP External Quality Assurance Programme for the network. During this meeting, a two-year plan with clear timelines for operationalizing the AFR EDPLN will be developed.

Figure 1: AFR EDP Laboratory Network

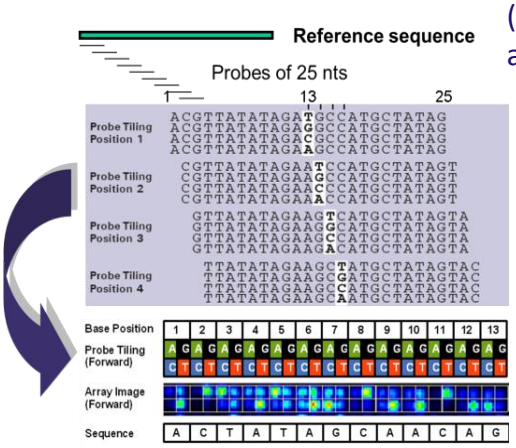
High rate of hepatitis E virus infection among swine suggests an animal reservoir and a zoonotic transmission in Cameroon, *Richard Njouom, Centre Pasteur Cameroon*

In Africa, more than 6 outbreaks of HEV have been described in the past decade and the case fatality is very high particularly among pregnant women.

The high prevalence of HEV among pigs in Cameroon and other African countries, where studies have been conducted, could suggest an additional pig reservoir and a zoonotic transmission in Africa. However, additional prevalence and genomic data on pigs and pig handlers in Africa are necessary before an additional zoonotic transmission of HEV in Africa can be ruled out as an EDP.

High-density re-sequencing DNA microarray in public health emergencies: Monkeypox detection in maculopapular lesions in two young Pygmies in the Central African Republic, *Emmanuel Nakoune, CAR- PI Bangui*

Since 2004, the DEVA PTR allowed development of a high-density re-sequencing microarray (RMA) in order to detect pathogens, including viruses and bacteria with their genetic elements, toxins and antibiotic resistance genes.



High-density re-sequencing microarray (HRM) was successfully used to detect and confirm Monkey-pox virus infection in two young pygmies in CAR. The technique should be considered by the network for adoption for EDPs, taking into account its high efficiency and rapidity to identify a virus. However, the technique may be more relevant for research purposes rather than for public health service activities.

Figure 2: Principle of re-sequencing microarray

Management of dengue outbreak in Abidjan, *Valery Edgard Adjogoua of Côte d'Ivoire-PI Abidjan*

The speaker mentioned that the laboratory capacity for diagnosing different viral diseases was achieved through cooperation with the Pasteur Institute of Dakar. The laboratory has capacity to conduct virological and entomological investigation for arboviruses. He reported co-infection of Yellow Fever and Dengue in the country. In addition, there is high risk of epidemics since the RNAs of these viruses have been detected in some arthropods and primates in Côte d'Ivoire.

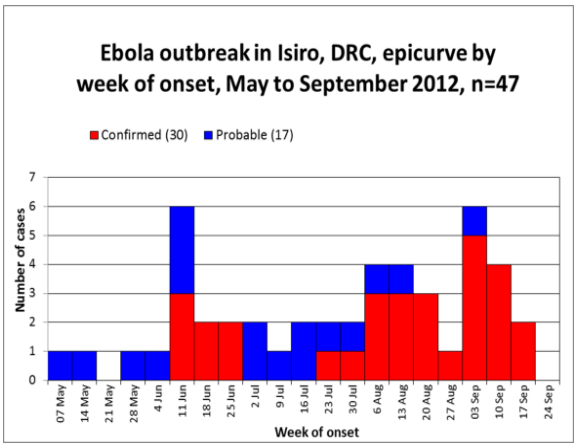


Figure 03: Ebola Outbreak in DR Congo, 2012

Overview of the outbreak response of Ebola in Isiro, DR Congo, including lessons learned, issues and challenges and way forward, *Karhemere Bin Shamamba Stomy, DR Congo (INRB)*

Given the overwhelming contribution by international partners, the meeting expressed the desire to get EDPLN members to participate in the response activities during Ebola outbreaks in DRC and other countries in the future. WHO is making efforts to deploy experts from Africa in such instances.

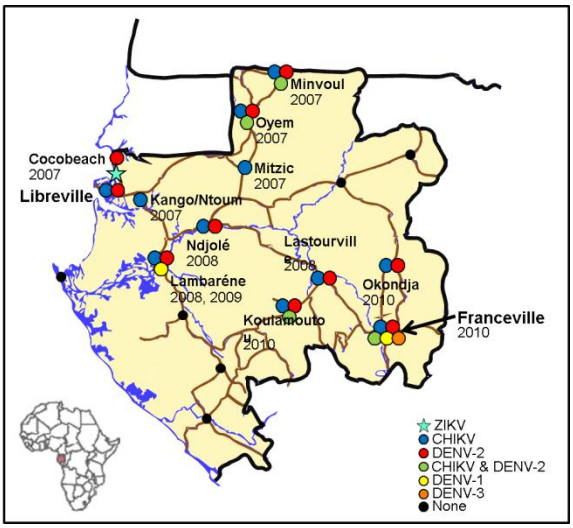


Figure 04: Outbreaks of arboviruses in Gabon, 2012-2013

Outbreak of Dengue and Chikungunya in Central Africa with evidence of co-infection and severe illness, *Mélanie Caron, Gabon (CIRMF)*

There have been outbreaks of DEN and CHIK from 2007 to 2013 in Gabon, with co-infection of both viruses being observed in humans and mosquitoes and co-circulation of CHIKV, DENVs, ZIKV. *Aedes albopictus* was the most prevalent and most infective vector species. Multiple dengue serotypes were detected in circulation (DEN 1,2,3) and were all found to be of Africanorigin/lineage.

Emerging dangerous pathogens at the animal-human interface in Ghana: Lessons learned, issues and challenges, way forward, *William Kwabena Ampofo, Ghana (NMIR)*

From surveillance samples that were negative for Yellow Fever, Lassa, hanta and leptospira were detected. No Lassa virus was detected in rodent samples collected in the area. The latest information indicated that two travelers from Liberia to Ghana were tested positive for Lassa.

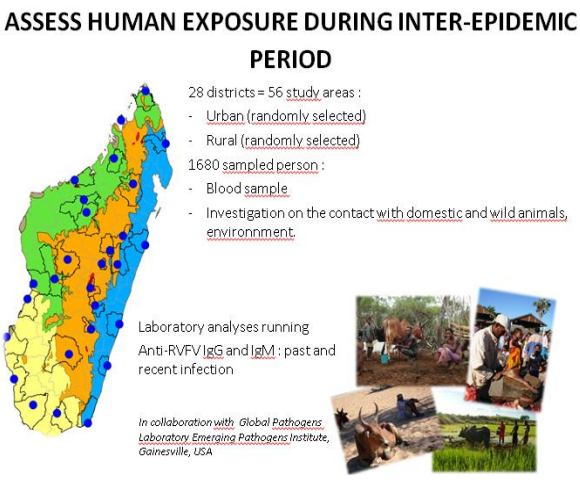
Publication on Lassa fever infection in human cases in the *Ghana Medical Journal* has provided the evidence to focus medical suspicion on VHF cases in Ghana. In addition, manuscripts on animal vector studies are underway to provide further evidence. In view of this, the recent and current animal and human interface studies need to share results to inform surveillance for prompt detection if such cases arise. It is crucial to utilize opportunities presented by global alerts on new EDPs to obtain resources to conduct epidemiological studies and improve IDSR.

Evidence for increased circulation of re-emerging VHF in Kenya: Lessons learned and recommendations, *Rosemary Sang, Kenya (KEMRI)*

The presentation provided an overview of documented and undocumented outbreaks of VHFs in Kenya, including RVF, CCHF, Dengue and Ngari viruses. An inter-epidemic activity of RVF was now known to occur in Kenya. The need for continued surveillance in areas of human animal interface for detection and early warning was emphasized. The recent surveillance demonstrated circulation of Ngari virus among vectors in several parts of the country (North Eastern, Eastern Kenya). This indicates that the virus may be circulating and causing undiagnosed Hemorrhagic Fevers in parts of Kenya.

Epidemiology of Rift Valley Fever in Madagascar; what we know and what next?, *Marie-Marie Olive Madagascar, (PI Antananarivo)*

The first detection of RVF outbreak was in 1979, followed by other outbreaks in 1990/91, 2008/09. Since the 2008/09 outbreaks, silent circulation of RVFV have been detected. However, the potential and actual vectors are still being investigated.



More work needs to be done to determine if the virus is imported from East Africa or is established (enzootic) in Madagascar. PI Madagascar is conducting research with a multidisciplinary approach (entomology, virology, epidemiology and environmental data), aimed at deciphering RVF transmission and circulation in Madagascar. The importance of including the age of animals sampled was discussed. The need for collaboration between veterinary and public health was highlighted in order to better understand the mechanisms of maintenance and transmission of RVFV in Madagascar.

Figure 05: Assessment of human exposure to RVF during inter-epidemic period

Seroprevalence of Crimean Congo hemorrhagic fever virus, Lassa virus and RVFV in Nigeria, *David Bukbuk, Nigeria, Maiduguri Laboratory*

Seroprevalence of RVF, CCHF and Lassa was reported in Borno State in Nigeria. The recent upsurge in Lassa cases is cause for concern (>2/3rds of the states in the country reported cases).

The serologic and virologic studies conducted earlier indicate the presence of CCHF & RVF viruses. The novel serologic tool (rNP-IgG ELISA) and PSC/FTA cards for serum sample collection and transportation were used in the survey in collaboration with NIID, Tokyo, Japan.
There was an offer from NICD-SA to re-confirm these results, using authenticated RVFV, and internal controls under the BSL4 condition.

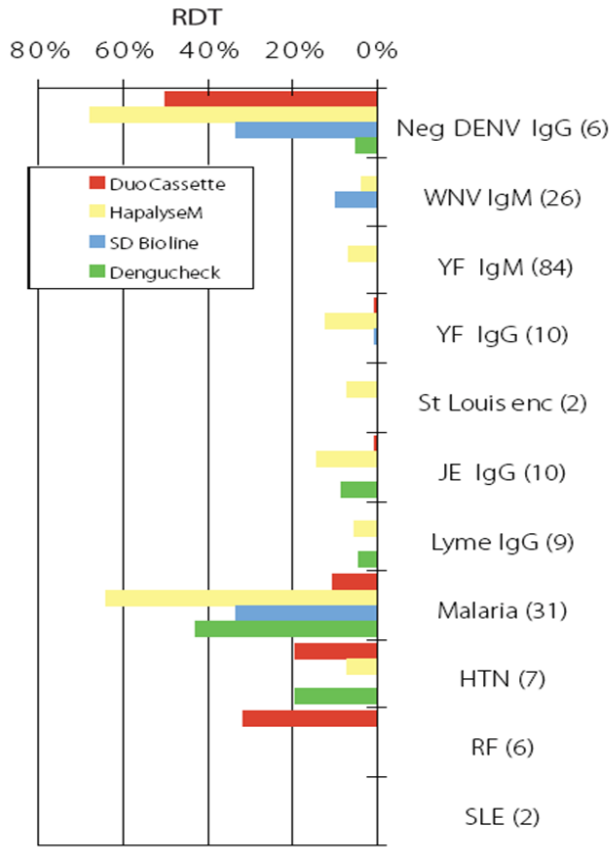
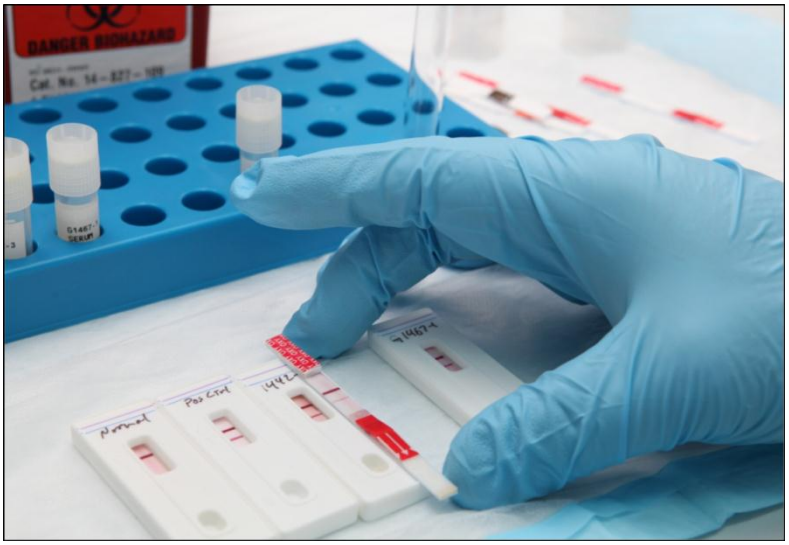


Figure 06: False positive rates (%) RDT tests

EDP surveillance and outbreak investigation in a changing context, *Amadou Alpha Sall, Senegal (PI Dakar)*

The surveillance activities being carried out in Kedougou were reviewed and the emergence of diseases like Dengue has been attributed to changes in human activity, including gold mining, urbanization, human migration, brick making, etc. The environmental modification is providing breeding habitats for vectors. The fear of DENV emergence in Africa was expressed, including occurrence of DHF, which is currently underplayed. Use of smart cycler platforms was encouraged for standardization of molecular diagnostics within the network.
Efforts are needed to improve diagnostics, outbreak investigation and fund raising for research. It was mentioned that there is no evaluation of any dengue Rapid Test in Africa.

Challenges of Lassa Fever Research in post-conflict Sierra Leone, *Augustine Goba, Sierra Leone (Lassa Fever Lab, Kenema)*



The report focused on work at Kenema hospital, based in a hotspot area. The use of lateral flow rapid test for antigen detection, ELISA Ag, IgM and IgG detection assay for diagnosis was presented.

It was reported that the development and evaluation of RDT with Corgenix Company and Tulane University was ongoing. More attention was needed on nosocomial transmission of Lassa virus in Sierra Leone.

Figure 07: Rapid Test for Lassa Fever.

The role of the South African BSL4 as a strategic regional facility for diagnosis, research and investigations of outbreaks caused by highly dangerous pathogens, *Janusz Paweska, South Africa (NICD):*

The institute provides areas and opportunities for collaboration. Facilities include bat colony for experimental work available in the BSL4, which is designed to be used for one health project. The BSL4 can be used for in-vitro/in-vivo tests like antivirus studies for EDPs. It is a valuable African resource, which is currently not fully exploited and is available to the network to utilize. This, together with the rich African biodiversity is a great opportunity for discovery of new and emerging viral pathogens.

Figure 08: BSL-4 in NICD/South Africa

Main findings from the EDP laboratory self-assessment questionnaire, *Ali Ahmed Yahaya, WHO*

The key findings are as follows: Insufficient collaboration between members of the AFR EDPLN [exchange of information], few laboratories participating in external quality assurance (EQA) programmes on EDP, laboratory field outbreak investigation not yet optimal and more effort needed to standardize diagnostic methodologies.

D. Key lessons learned from the presentations and discussions

- Monoclonal antibodies (MAbs) for post-exposure treatments against Ebola could be lifesaving in the WHO African Region notably for laboratory technicians from EDPLN, health-care workers and patients. It is crucial that EDPLN sets up a mechanism for clinical trials, in close collaboration with other laboratories outside the Region.
- It is important to promote the sharing of specimens through EDPLN with ownership of materials by countries that are sending the samples. The use of existing mechanisms such as the Pandemic Influenza Preparedness (PIP) Framework may need to be explored.
- Rather than organizing a regional training on EDP, an idea of on-site training for network members was discussed and found not to be cost effective.
- In order to get the relevant participants to attend WHO meetings or workshops for EDP, the invitations should specifically mention the heads of EDPLN and/or the names of the official EDP national reference laboratories.
- To be part of EDPLN, it is crucial that the laboratory operates in accordance with the approved terms of reference. Other laboratories may join the network accordingly, such as Algeria and Tanzania. The member-laboratories of EDPLN may need to be classified based on their capacity, taking into account the framework from the other regional laboratory networks. This will facilitate the designation and selection of Regional Reference Laboratories for specific EDPs.
- The EDPLN should be enhanced in order to ensure laboratory confirmation of EDP from neighboring countries if national capacity does not exist.
- WHO should resend a message to the Ministry of Health to officially designate the Focal Person of EDP for each laboratory.
- Role of pigs as reservoirs of other diseases like Ebola (e.g. Ebola in Philippines) makes pig important focus and target for EDP surveillance.
- There is a need for differential diagnoses for other flaviviruses to be included in our action plan. An appropriate algorithm and syndromic approach needs to be developed and harmonized within the EDPLN.
- EDPLN may also need to set up a mechanism for following the modification of viral genomics in order to ensure modeling studies for prevention of public health events.
- EQAP for selected EDP should be established as soon as possible.
- SLIPTA initiative and other WHO resources can also be used by EDPLN members to enhance laboratory quality management issues in their laboratories.
- The meeting expressed the desire to have EDPLN members to participate in the response activities during EDP outbreaks within the Region. EDPLN should play a critical role in building a roster of a multidisciplinary team during outbreak investigations. The One Health initiative should be used as an opportunity for this purpose as well as the International Health Regulations (IHR 2005). Transfer of technology during outbreak investigations also needs to be further implemented through the EDPLN.
- EDPLN needs to develop a minimal capacity requirement for field investigation of BSL3/BSL4 agents.

- Collection of environmental specimens may help in public health decision. The use of one technique such as PCR may underestimate the real situation in the field. Networking between EDPLN members will promote the expansion of techniques for use during outbreaks. The plan to set up a biobank is also crucial for this purpose to promote virus isolation activities for downstream studies. It is also key for ELISA techniques to promote the use of appropriate reagents with high specificity and sensitivity in order to reduce a false positivity. The cross reactivity is still an issue for interpretation of the results. EDPLN will facilitate the validation of the essays.
- The emergence of a new strain such as the Ebola Bundibugyo virus in Uganda indicates the need for EPLN to enhance capacity for primer design and other related capacity for improved diagnosis.
- There is no enough surveillance and research on Lassa in the endemic regions in West Africa. It seems to be a neglected virus in comparison to Ebola and Marburg. There is a need for serological screening of contacts of Lassa-positive cases.
- The reemergence and under reporting of Dengue outbreaks and incidence in Africa was observed. The need to develop a concept paper to profile the growing dengue problem in Africa was suggested. EDPLN needs to play a critical role on testing RDTs in Africa for EDPs such as Dengue.
- Since VHFs are almost always zoonotic, there is a need for focused surveillance at the human, livestock and wildlife interface. EDPLN needs to conduct further serological studies in collaboration with the animal health sector.
- There is a need for enhancing the collaboration between laboratories in the EDPLN.
- It is necessary to have an array of diagnostic tools to be adopted by network members.
- EDPLN indicated the importance of negotiation for equipment maintenance. The challenges on biosafety and biosecurity regulations and infrastructure need to be addressed progressively. Improvement of the standard of the EDPLN facilities should be one of the priority objectives. The use of African Biosafety Association is an opportunity to be explored.
- Network expressed interest in mobile BSL3 for field investigations of EDP outbreaks.
- EDPLN needs to enhance the mechanism to ensure better use of existing BSL4 facilities in the Region.
- The members of the network are encouraged to develop jointly a concept paper on selected EDP (example Dengue, etc), which can be published.
- YF negative samples need further investigation in order to determine etiology.
- Suggestions made for an Afro EDPLN biobank to promote research within the continent.
- Resource mobilization for the implementation of the EDPLN plan of action is very important. An approach for involving all stakeholders needs to be adopted.

E. Presentation of round table discussions

1) Enhance biosafety and biosecurity to achieve certification for BSL3 for at least 5 countries taking into account the need for subregions

- Conducting assessment for biosafety and biosecurity within EDPLN;
- Promoting oversight mechanisms including audit;
- Supporting improvement of procedures and infrastructure;
- Supporting establishment of a network monitoring and regulatory framework;
- Training dedicated staff (technical and biosafety officer) within EDPLN and with AFR biosafety association;
- Planning biosafety training for outbreak response (strengthening capacity for local personnel).

2) Improve the collection and shipping of specimens

- Enhancing national specimen shipment at all levels of the health system, using the opportunities of different programmes and laboratory networks;
- Strengthening the international shipment system, including establishment of contract with international courier service providers;
- Conducting refresher courses for transport of infectious substances.

3) Strengthen the diagnosis of EDP (focus on targeted diseases) using recognized technologies

- Definition of capacity/core competencies for each laboratory based on stratified level of the EDPLN
  - Developing and harmonizing algorithm by pathogen;
  - Defining and standardizing laboratory techniques by pathogen and by containment level;
  - Establishing the referral system within EDPLN by pathogen, based on the mapping of laboratory capacity for confirmation and further characterization of each EDP.

- Establishment of strategic biobanks for EDPLN in line with recognized standards like EVA
  - Conducting inventory of selected laboratories to serve as biobanks in the region,
  - Setting up a mechanism for sharing isolates within the biobanks;
  - Setting up a mechanism of tracing the flow of shipment of strains/isolates;
  - Ensuring safe and secure storage for archived and reference samples in selected biobanks;
  - Promoting appropriate/standardized biobank facilities;
  - Promoting further characterization of strains/isolates by AFR EDPLN.

- Establishment of standards for quality control diagnostic
  - inventory of laboratories with access to different EDPs;
  - Pilot studies for burden of EDPs;
  - Planning of field visits for assessment of selected countries;
  - Enhancement of storage capacity of selected referral laboratories;
  - Reinforce the mechanism for sharing of potential strains/isolates among selected laboratories;
  - Development of quality standards;
  - Transfer of technology for selected laboratories.

- Establishment of EQA mechanisms for EDP in AFRO
  - Selection of pathogens to be included in the EQAP;
  - Sharing by NICD of an EQA proposal to WHO;
  - Organization of a meeting between EQA providers by WHO;
  - Development of AFRO EQA on EDP between WHO and NICD including other laboratories outside the regions).

- Validation of panels (positive and negative controls):
  - There is a need to establish a mechanism for sharing 50 positive and 50 negative sera for each EDP (CHIKV, DENV, WNV, EBOV, Marburg, LASV, etc.) by EDP members. Members may share strains/isolates during outbreaks, including cells from infected patients for relevant pathogens (involvement of selected institutes) in order to develop vaccine, therapy, etc.

- Maintenance of laboratory equipment (negotiation for the EDPLN network)
  - Signing contracts with providers for long-term servicing of general equipment;
  - Ownership of countries to promote accreditation process: budget, basic preventive maintenance by each laboratory, training;
  - Support from the EDPLN needs to be identified;
  - Technical assistance from WHO: training, etc.

- Surveillance by syndromic approach
  - Development of multiplex panels for screening and confirmation of suspected VHF cases: use IDSR case definition, referral systems for confirmation;
  - Collaboration for research projects: identification of research projects within EDPLN on EDP like DENV, RVFV, LASV, CCHFV; cross reactivity of flaviviruses and other viruses.

- Reagent production: Pilot project on targeted diseases/mapping burden of EDPs, reporting cases along IHR standard/Pilot studies (reagent production, reference diagnostic)
  - Reagent production: immune reagent e.g. Ag, Monoclonal Antibodies, polyclonal antibodies, PCR control standards, recombinant antigens;

- Identification of specific assays for transfer of technologies
    - In-house reagent: Senegal (YFV), Madagascar (DENV, CHIKV, WNV for IFA, RDT for plague), NICD (IF Slide production for all pathogens, transfer of technologies for RVFV and other needs).

- Evaluation of commercial Rapid Diagnostic Test (specificity and sensibility?) by EDPLN develop validation panels,
- Identification of experts within EDPLN for specific diagnostic training/consultations (DENV, LASV, CCHFV, RVFV…)
    - Identification of numbers of experts by each laboratory
    - Mapping of expertise by pathogen
    - Mapping of mobile laboratory capacity.

4) Promote collaboration and networking

- Visibility, dissemination, branding of EDPLN
    - Website for AFR EDPLN in English, French, Portuguese (public and private parts, WHO manager, funding);
    - Bi-annual newsletter (agreement of the content);
    - Design for a Logo?

- Communication and networking
    - Publications;
    - Data sharing, evidence building;
    - Content of the website for AFR EDPLN (diagnostic capacities, EDPLN contacts, procedures, SOP, fact sheet for diseases…).

- Monitoring of progress
    - Indicators, role and responsibility
    - Periodic conference calls
    - Annual meeting
    - Documentation of numbers of key achievements/success stories from EDPLN.

- Advocacy and fundraising and coordination

5) Strengthen the capacity of EDPLN in outbreak investigations and response

- Strengthening laboratory outbreak response capacities for Africa
    - Multidisciplinary training (virology, bacteriology, entomology, epidemiology, social mobilization, clinical);
    - Identification of multidisciplinary EDPN team;
    - Organization of specialized training: clinical laboratory, VHF, dengue, etc…;
    - Cross-border investigations for EDPs.

- Establishment of two Hubs for mobile laboratory in South Africa and Senegal
  - Training to enhance mobile laboratory capacities (regional staff, standardize SOPs, safety and operational manuals);
  - Diagnostic of EDP, plus differential diagnostic;
  - Clinical laboratory testing (hematology and biochemistry);
  - Stockpile of equipment for deployment;
  - Biosafety and biosecurity in the field;
  - Development of a logistic operational plan for timely laboratory deployment.

F. Terms of Reference of the AFR EDPLN

EDP reference laboratories are national institutions designated by ministries of health and recognized by WHO for the purpose of participating in the work of the WHO regional EDPLN.

The terms of reference for EDP reference laboratories include:

1. Perform laboratory identification and characterization of viral infections causing epidemics of VHFs or Arboviruses or Monkeypox or other emerging infectious diseases, using recognized technologies;

2. Carry out, on WHO's request, confirmatory testing of specimens in case the members of the network request for further characterization of the pathogens;

3. Support Member States in outbreak investigation and response to EDPs;

4. Assist WHO to develop or update norms, guidelines and training materials for diagnosis of EDPs;

5. Serve, where applicable, as centres for training courses and for training individual laboratory staff from within and outside the countries;

6. Provide expertise and consultancy, where required, to evaluate and advise on laboratory services and to provide specialized training;

7. Provide to the national ministry of health/IHR focal point for WHO Country Office and WHO Regional Office for Africa regular and timely laboratory-based surveillance data and other information of public health significance on targeted EDPs, particularly from their own countries and neighbouring countries that do not have EDP laboratories;

8. Conduct or support research studies on EDPs in collaboration with the ministry of health, and share findings with members of the Network, WHO Country Office and WHO Regional Office for Africa.

G. Programme

TUESDAY, 28 MAY 2013		
Time	**Topic**	**Responsible Official(s)**
08.30-08.45	Introduction of participants	*Ali Ahmed Yahaya*, WHO
08.45-09.00	Objectives, expected results and method of work	*Ali Ahmed Yahaya*, WHO
09.00-09.20	Overview of the Global EDPLN	*Pierre Formenty*, WHO
09.20-09.40	Overview of the AFR EDPLN	*Ali Ahmed Yahaya*, WHO
09.40-10.00	Discussion	
10.00-10.30	**Group Photo & Coffee/Tea Break**	
10.30-10.50	High rate of hepatitis E virus infection among swine suggests an animal reservoir and a zoonotic transmission in Cameroon	*Richard Njouom*, Cameroon-CPC
10.50-11.00	Discussion	
11.00-11.20	High-density re-sequencing DNA microarray in public health emergencies: Monkeypox detection in maculopapular lesions in two young Pygmies in the Central African Republic	*Emmanuel Nakoune* CAR- PI Bangui
11.20-11.30	Discussion	
11.30-11.50	Management of dengue outbreak in Abidjan	*Valery Edgard Adjogoua* Côte d'Ivoire-PI Abidjan
11.50-12.00	Discussion	
12.00-12.20	Outbreak of Ebola in Isiro, DR Congo: Lessons learned, issues and challenges, way forward	*Karhemere Bin Shamamba Stomy* -DR Congo (INRB)
12.20-12.30	Discussion	
12.30-12.50	Outbreak of Dengue and Chikungunya in Central Africa: evidence of co-infection and severe illness	*Mélanie Caron* Gabon (CIRMF)
12.50-13.00	Discussion	
13.00-14.00	**Lunch & poster presentations**	
14.30-14.50	Emerging Dangerous pathogens at the animal-human interface in Ghana: Lessons learned, issues and challenges, way forward	*William Kwabena Ampofo* Ghana (NMIR)
14.50-15.00	Discussion	
15.00-15.20	'Evidence for increased circulation of re-emerging VHF in Kenya; Lessons learned and recommendations'	*Rosemary Sang* Kenya (KEMRI)
15.20-15.30	Discussion	
15.30-16.00	**Coffee/Tea Break & poster presentations**	
16.00-16.20	Epidemiology of Rift Valley Fever in Madagascar; what we know and what is next?	*Marie-Marie Olive* Madagascar (PI Antananarivo)
16.20-16.30	Discussion	
16.30-16.50	Seroprevalence of Crimean Congo hemorrhagic fever virus, Lassa virus and RVFV in Nigeria	*David Bukbuk* Nigeria (Maiduguri Laboratory)
16.50-17.00	Discussion	

WEDNESDAY, 29 MAY 2013		
Time	**Topic**	**Responsible Official(s)**
08.30-08.50	EDP surveillance and outbreak investigation in a changing context	*Amadou Alpha Sall* Senegal(PI Dakar)
08.50-09.00	Discussion	
09.00-09.20	Epidemiology of Lassa Fever in Post-conflict Sierra Leone: Seasonal demographics	*Augustine Goba* Sierra Leone (Lassa Fever Lab, Kenema)
09.20-09.30	Discussion	
09.30-09.50	The role of the South African BSL4 as a strategic regional facility for diagnosis, research and investigations of outbreaks caused by highly dangerous pathogens	*Janusz Paweska* South Africa (NICD)
09.50-10.00	Discussion	
10.00-10.20	Main findings from the EDP laboratory self-assessment questionnaire	Ali Ahmed Yahaya, WHO
10.20-10.30	Discussion	
10.30-11.00	**Coffee/Tea Break & poster presentations**	
11.00-11.30	Introduction to the Round Table for developing the EDPLN action plan	*Ali Ahmed Yahaya*, WHO
11.30-11.40	Discussion	
11.40-12.00	Round Table for EDPLN action plan	All
12.00-13.00	Round Table for EDPLN action plan	All
13.00-14.00	**Lunch & poster presentations**	
14.00-15.30	Round Table for EDPLN action plan	All
15.30-16.00	**Coffee/Tea Break & poster presentations**	
16.00-17.00	Round Table for EDPLN action plan	All
THURSDAY, 30 MAY 2013		
Time	**Topic**	**Responsible Official(s)**
08.30-10.30	Round Table for EDPLN action plan	All
10.30-11.00	**Coffee/Tea Break & poster presentations**	
11.00-13.00	Round Table for EDPLN action plan	All
13.00-14.00	**Lunch & poster presentations**	
14.00-15.30	Round Table for EDPLN action plan	All
15.30-16.00	**Coffee/Tea Break & poster presentations**	
16.00-17.00	Presentation of the Plan of Action and recommendations	Rapporteurs

H. List of participants

	Country	Name	Organization & Address	E-mail Address
1	Cameroon	Dr Richard Njouom	Centre Pasteur of Cameroon, P.O. Box 1274, Yaounde	njouom@pasteur-yaounde.org
2	Central African Republic	Dr Emmanuel Nakoune	Institut Pasteur of Bangui,	enakouney@gmail.com
3	Côte d'Ivoire	Dr Edgard Valery Adjogoua	Institut Pasteur de Côte d'Ivoire 01, BP 490, Abidjan 01	edagardadjogoua@pasteur.ci
4	DR Congo	Dr Karhemere B. Shamamba Stomy	INRB, Lu Dela Democraite Gombe, Kinshasa	stomy-karhem@yahoo.fr
5	Gabon	Ms Melanie Caron	CIRMF-UMVE, BP 769 Franceville	melaniecaron.cirmf@gmail.com
6	Ghana	Prof. William Ampofo	Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, P.O. Box LG 581, Legon, Accra	wampofo@noguchi.mimcom.org
7	Kenya	Dr Rosemary Sang	Kenya Medical Research Institute, P.O. Box 54628, Centre for Virus Research, Nairobi	rosemary.sang@usamru-k.org
8	Madagascar	Melle Marie-Marie Olive	Institut Pasteur de Madagascar, BP 1274, Ambatofotsikely, Antananarivo 101	mmolive@pateur.mg
9	Nigeria	Dr David Nadeba Bukbuk	University of Maiduguri, WHO National Polio/ITD Laboratory, University of Maiduguri Teaching Hospital Maiduguri	davidbukbuk@outlook.com or bukbuk@unimaid.edu.ng
10	Senegal	Dr Amadou Alpha Sall	Institut Pasteur de Dakar, 36 Avenue Pasteur, Dakar	asall@pasteur.sn
11	Sierra Leone	Dr Augustine Goba	Lassa Fever Laboratory, Kenema Govt. Hospital, 16 Kenneh Street, Kenema	augstgoba@yahoo.com
12	South Africa	Prof. Janusz Paweska	National Institute for Communicable Diseases (NICD), Moderfontein Rd, Sandringham, Johannesburg	janunp@nicd.ac.za

WHO Secretariat		
Dr Ali Ahmed Yahaya	WHO/AFRO, BP 06 Cite Djoue, Brazzaville, Republic of Congo	yahayaa@afro.who.int
Dr Pierre Formenty	WHO/HQ, Geneva, Switzerland	formentyp@who.int
Dr Lincoln Charimari	WHO/Zimbabwe, 82-86 Enterprise Road, Highlands, P.O. Box BE 773, Belvedere, Harare, Zimbabwe	charimaril@who.int
Dr Olushayo Olu	WHO/Zimbabwe, 82-86 Enterprise Road, Highlands, P.O. Box BE 773, Belvedere, Harare, Zimbabwe	oluo@who.int
Dr Messret Eshetu	WHO/Zimbabwe, 82-86 Enterprise Road, Highlands, P.O. Box BE 773, Belvedere, Harare, Zimbabwe	eshetum@who.int