

The One Health Approach in Public Health Surveillance and Disease Outbreak Response: Precepts & Collaborations from Sub Saharan Africa

Chima J. Ohuabunwo MD, MPH, FWACP

Medical Epidemiologist/Assoc. Prof, MSM Department of Medicine & Adjunct Professor, Hubert's Department of Global Health, Rollins School of Public Health, Emory University, Atlanta GA

Learning Objectives: At end of the lecture, participants will be able to;

- Define the One Health (OH) concept & approach
- State the rationale and priorities of OH Approach
- List key historical OH milestones & personalities
- Mention core OH principles and stakeholders
- Outline some OH precepts & collaborations
- Illustrate OH application in public health surveillance and outbreak response

Presentation Outline

- Definition of the One Health (OH) Concept & Approach
- Rationale and Priorities of OH Approach
- OH Historical Perspectives
- OH approach in Public Health Surveillance & Outbreak Response
- One Health Precepts & Collaborations in Africa
 - West Africa OH Technical Report Recommendations
- Conclusion and Next Steps

One Health Concept: The What?

- The collaborative efforts of multiple disciplines, working locally, nationally and globally, to attain optimal health for people, animals and the environment (AVMA, 2008)
- A global strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment

One Health Approach: The How?

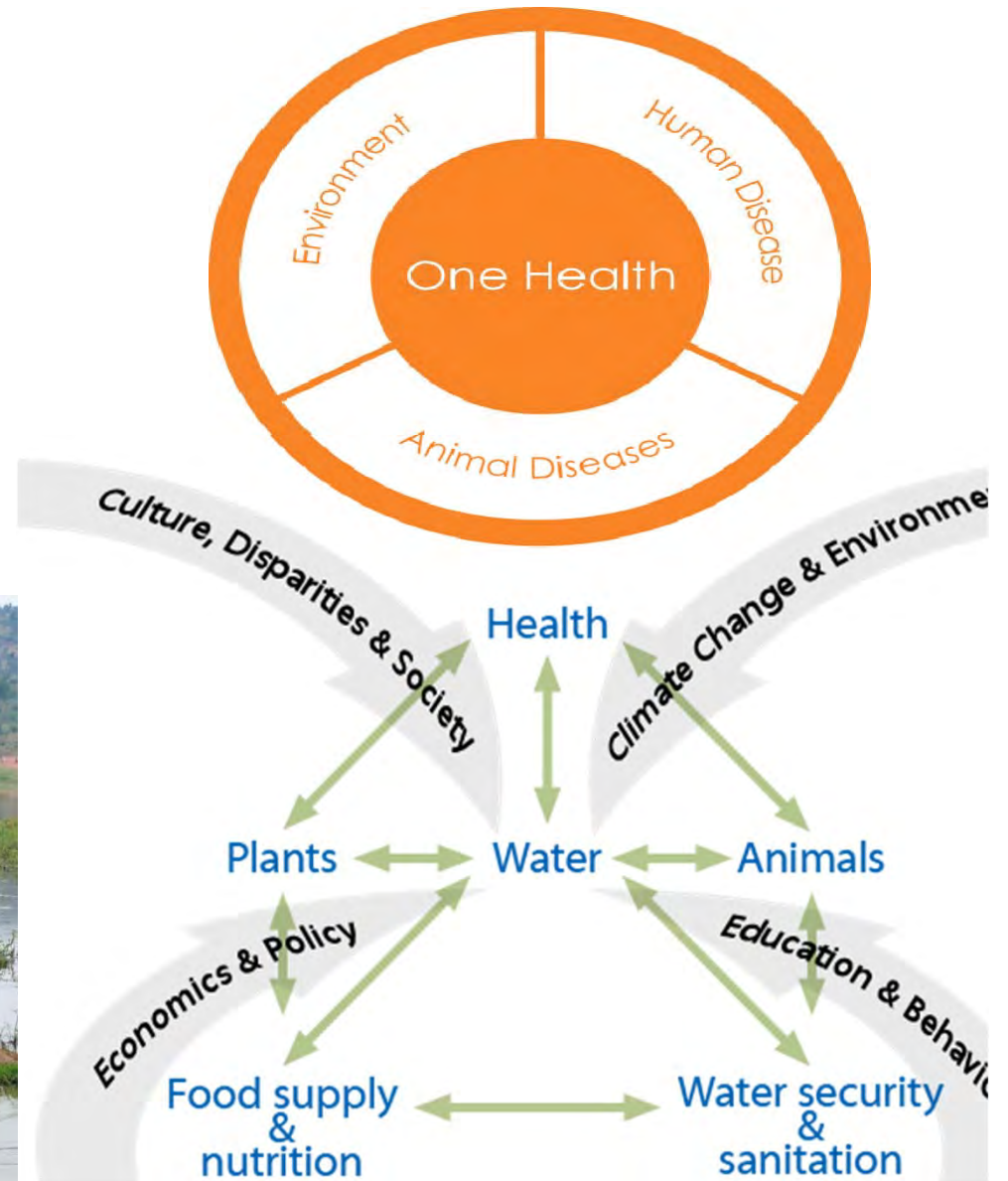
- Innovative strategy to promote multi-sectoral and interdisciplinary application of knowledge and skills of medical, public health, veterinary and environmental experts by working together to address human, animal and environmental health challenges



One Health Approach: The Why?

- Health of animals, people and the viability of ecosystems inextricably linked
- Intensity of human-animal interactions increase emerging and re-emerging diseases risks or health problems
- Many determinants of health outcomes are outside the health sector
- Policies and actions in multiple sectors have implications for health outcomes

Why One Health: Emerging Health Risks



Priority Public Health Threats needing One Health Approach

- Priority public health threats addressed using the One Health Approach include:
 - Emerging and re-emerging zoonotic and infectious diseases of epidemic and pandemic potential
 - Antimicrobial resistance (AMR)
 - Pollutants and environmental contaminants
 - Food safety and dietary health risks
 - Bio-security issues : Bioterrorism & Biohazards

Historical Perspectives: Animal Disease Control Measures .. 1762 - education about mgt. of diseases in livestock



- Lancisi recommended that all ill and suspect animals be destroyed and buried in lime
- Principles were a milestone in controlling the spread of contagious diseases in animals
 - Safe burial in VHDs
 - Ebola, Marburg, Lassa

Historical Perspectives: One Health in the 19th Century .. Coined the term ‘Zoonosis’



- Rudolf Virchow (1821-1902), a German physician and pathologist said, “between animal and human medicine there are no dividing lines--nor should there be.”

Historical Perspective: Zoonosis

- **1980's, epidemiologist Calvin Schwabe** called for a unified human and veterinary approach to combat zoonotic diseases, providing the modern foundation for One Health
- Concept waned in 20th Century but resurfaced in the 21st Century with emerging and re-emerging zoonotic infectious diseases

Emerging and Reemerging infections - 70% vector-borne or zoonotic

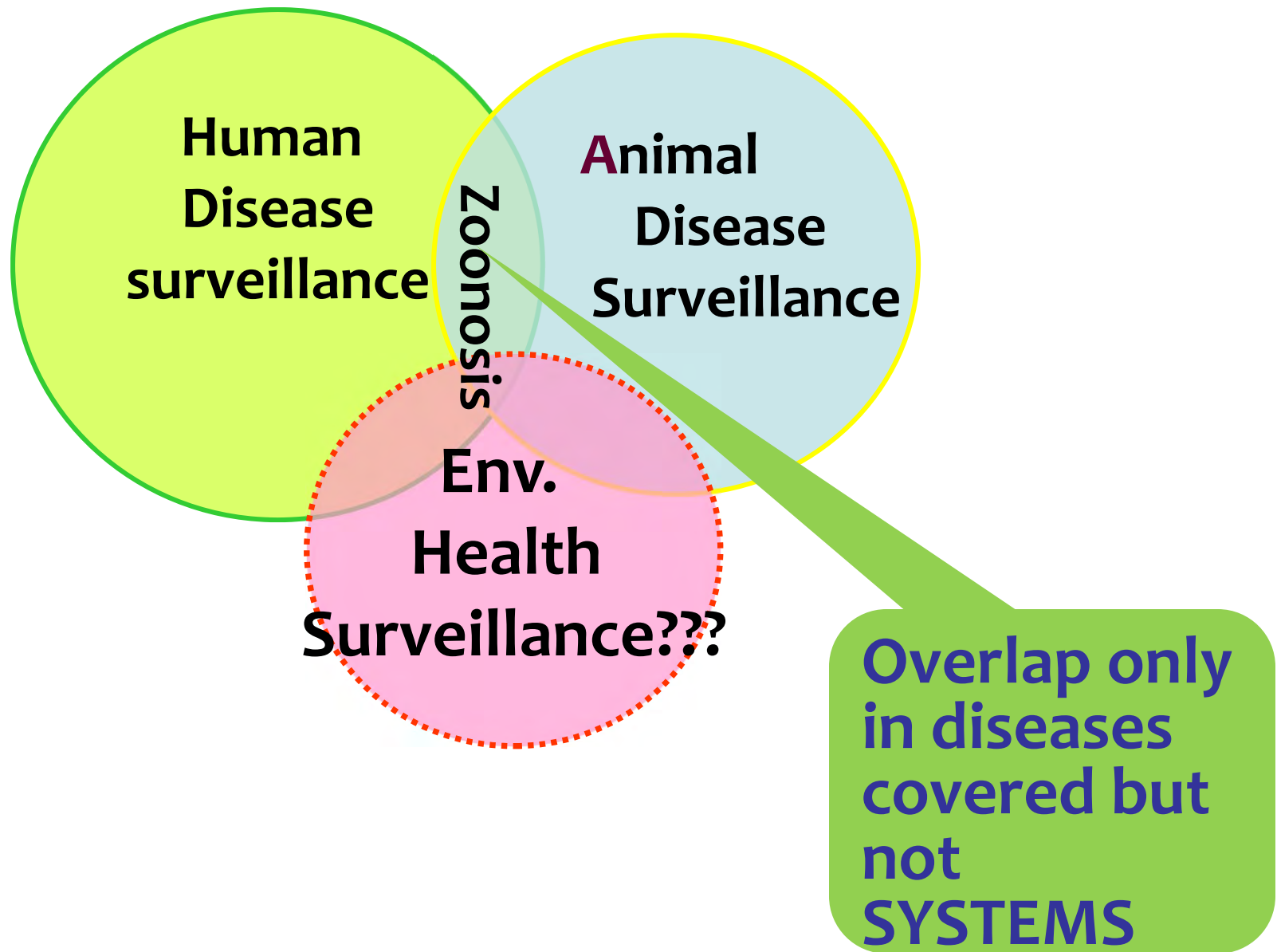


One Health Surveillance

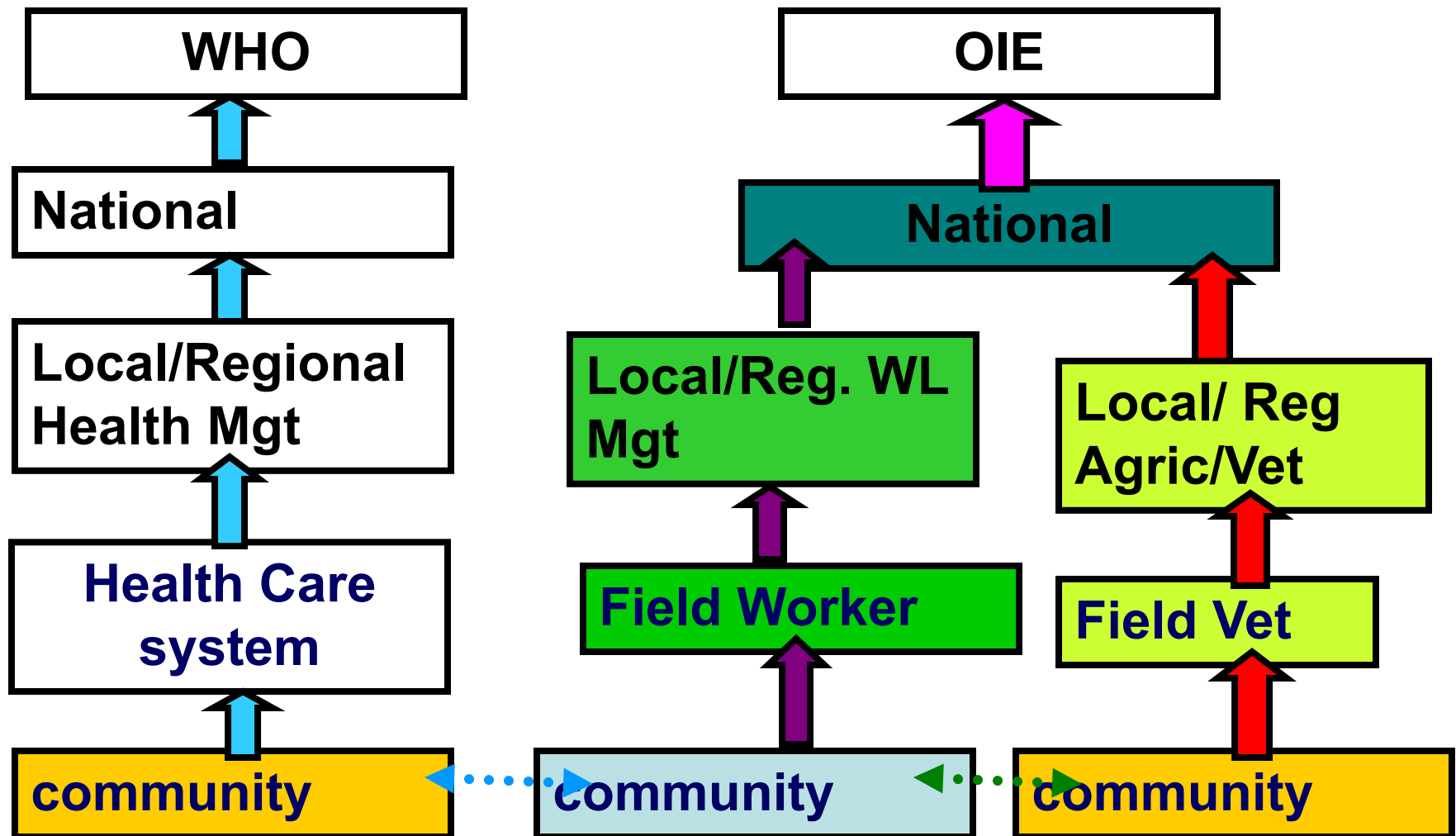
- The concept seeks to detect potential or existing risks that originate at the “human-animal-environmental” interface



Current Human & Animal Disease Surveillance



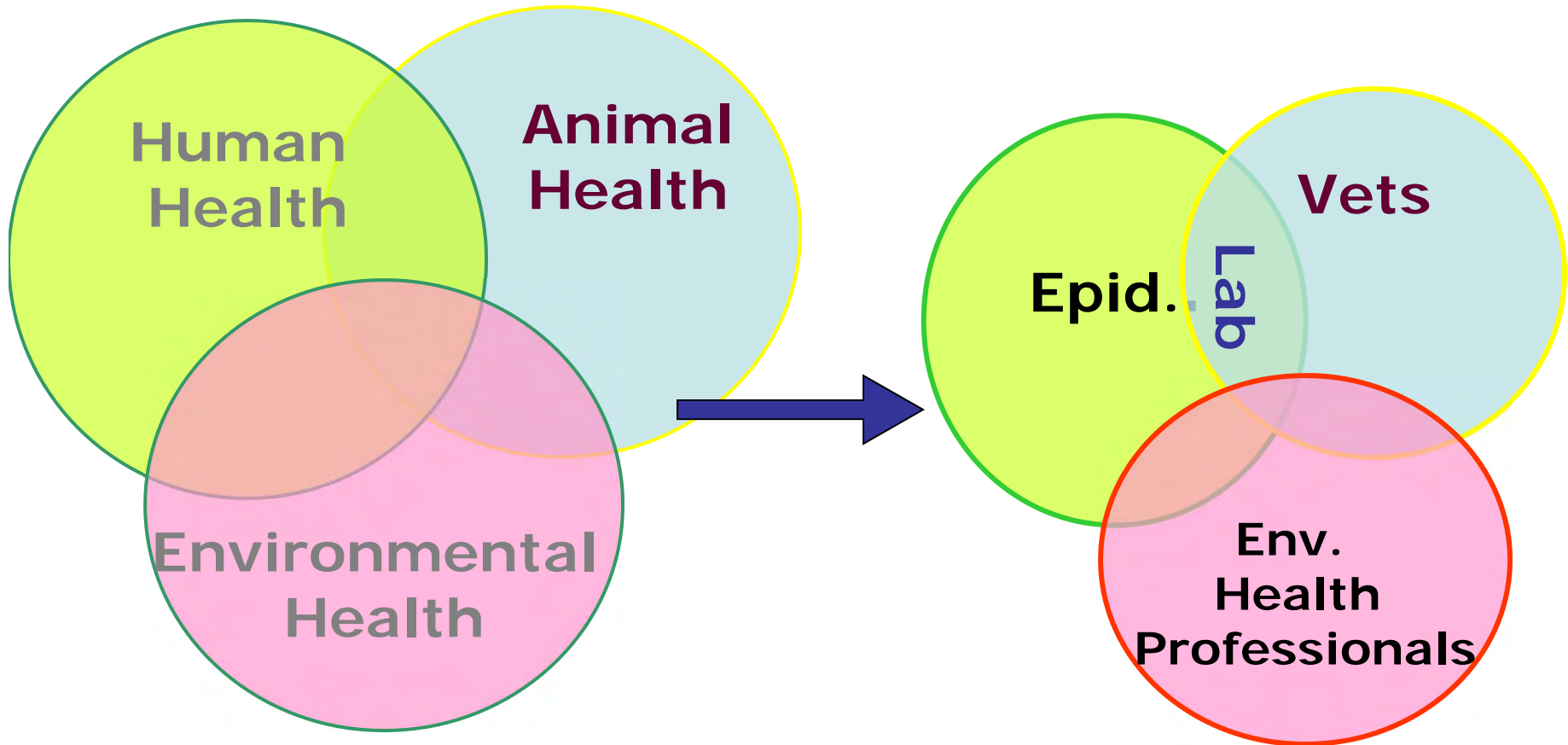
Information flow in Surveillance Systems



Disease Surveillance in Companion Animals

- Approximately 63% of all U.S. households own at least one pet
- Most commonly owned animals include:
 - Cats (90.5 million)
 - Dogs (73.9 million)
 - Small mammals (18.2 million)
 - Birds (16.6 million)
 - Aquarium Fish (140 million freshwater/9 million saltwater)
- Pet surveillance should be part of public health surveillance
- Animals as sentinels: infections, poisoning - Pb, Hg

Epidemiological and Human Resource Triads



Stakeholders in One Health

- Global, regional and local agencies involved in animal, human and environmental health include:
 - World Health Organization (WHO),
 - World Organization for animal Health (OIE)
 - Food and Agriculture Organization (FAO)
 - Centers for Disease Control and Prevention (CDC)
 - USAID Emerging Pandemic Threats Program, P&R
 - African Union: Africa CDC, Inter-African Bureau for Animal Resources(AU - IBAR)
 - Line Ministries, Academia –SPH, Vet Med, SoM
 - Professional Associations & Networks – WVMA, WMA, AVMA, OHCEA, AFENET

AFENET OH Workshops: WA FELTPs & Vet Services, Accra - May 2009



Accra Declaration on Zoonosis Control signed

Countries and agencies represented – Senegal, Burkina Faso, Togo, Mali, Niger, Nigeria, Ghana, WHO AFRO, WHO Ghana, CDC Ghana, USAID West Africa, USAID Africa Bureau, CDC Atlanta, AFENET K Becker, C Ohuabunwo, Y Ndjakani, P Nguku, P Nsubuga, D Mukanga, F Wurapa. Field epidemiology and laboratory training programs in West Africa as a model for sustainable partnerships in Animal and Human health. JAVMA, Vol 241, No. 5, September 1, 2012

One Health Workforce Capacity Development

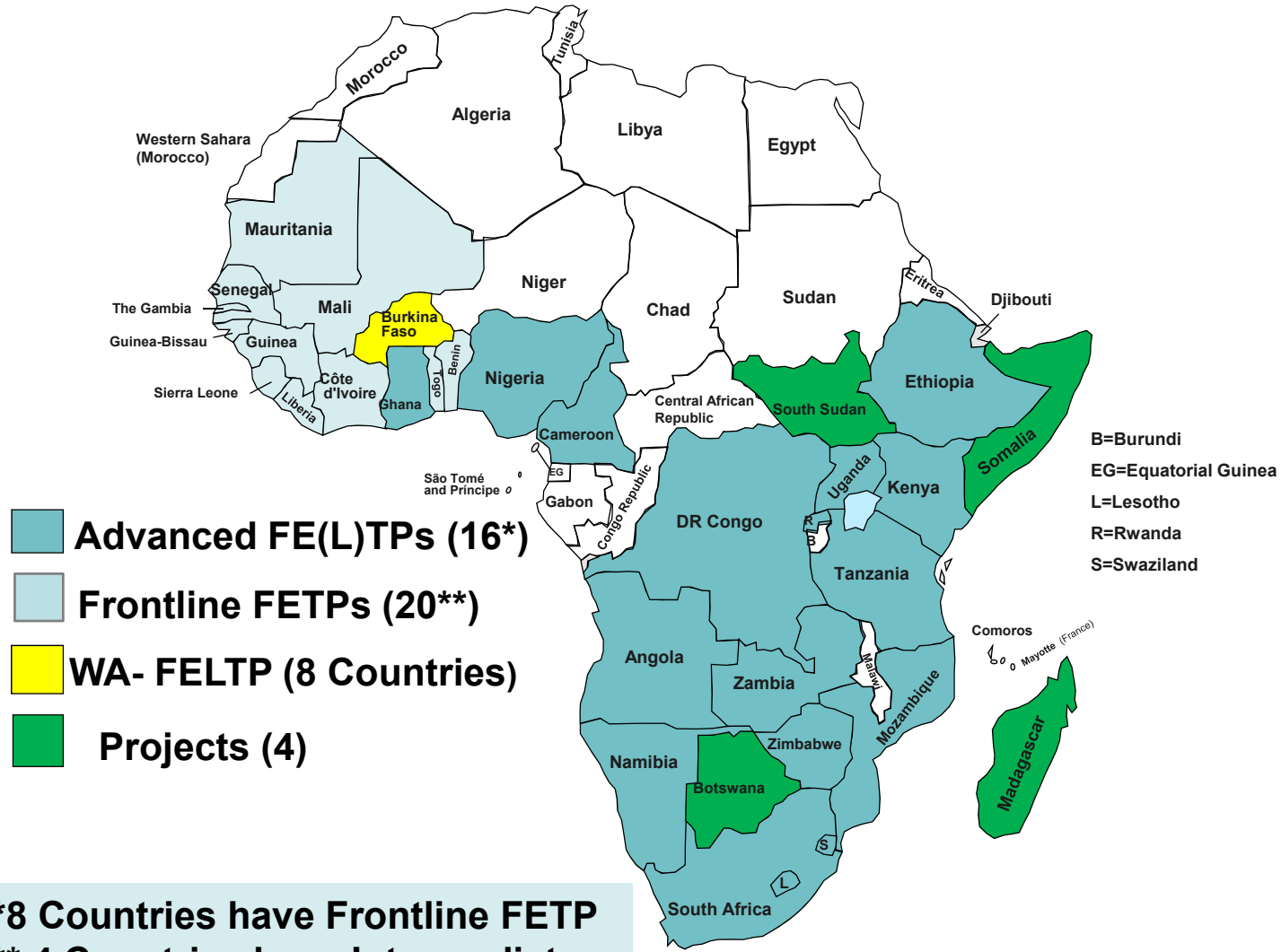
1. Capacity building for One Health

- Aims at building leadership and advanced technical skills
- Tiered training
 - i. Short course on surveillance, Outbreak investigation and response -Frontline workers
 - ii. Field Epidemiology and Laboratory Training Programs (FELTP)- Graduate
 - iii. Vet Epidemiology training Program-Graduate
 - iv. One Health Fellowship-Post FELTP

One Health Short Courses

1. Zoonotic Disease Surveillance, Outbreak Investigation and Management
2. Participatory Epidemiology
3. Leadership and Management
4. Scientific writing and communication
5. Monitoring and evaluation of public health interventions
6. Geographical and Socio-economic mapping, (Courses: GIS and Google map; Epi Map /Health map)

FETPs in Sub-Saharan Africa – 3 Levels



***8 Countries have Frontline FETP**
**** 4 Countries have Intermediate**

One Health Fellowship... 1

- Started with support from USAID Emerging Pandemic Threats-EPT project & US CDC
- To enhance One Health knowledge and skills of field epidemiology graduates
- Strengthen the implementation of IDSR and IHR
- Upon completion, fellows provide technical expertise to their respective sectors in;
 - disease surveillance
 - outbreak investigation and response
 - control and prevention of zoonoses

One Health Fellowship... 2



OH Fellows conduct FGD on Brucellosis in Mubende district-Uganda



OH Fellows collect blood samples to test for brucellosis



One Health Fellowship Graduates (Seated - 6)

Applied Vet Epidemiology Training Program

- Started in 2010 a grant from USAID RESPOND project
- 2-yr 75% field & 25% didactic training in applied vet epi
- Hosted at Makerere University- College of Vet Med

- Objective: Train holistic veterinary epidemiologists who will lead and contribute to significant disease control, prevention and outbreak response in public health system at district and national levels

- 1st cohort – Five trainees drawn from Uganda districts
- 2nd cohort expanded to other east & central African countries – transitioned to OHCEA

Applied Vet Epidemiology Training- FETPv: OB Investigation & Predictive Surveillance



Avian Influenza & other Zoonotic Infections Project (AIZIP)

- Launched in 2008 with support from USAID
- Objective to strengthen capacity for Avian and pandemic influenza preparedness and response
- Premised on the “One World One Health” concept
- Assist countries implement IHR 2005
- Supported response efforts to Influenza A (H1N1) in Network countries in 2009
- Supported Kenya in fast tracking of IHR in 2009



Role of outbreak response One Health teams

- Provide prompt and effective response: Case detection, contact tracing + referral, surveillance, alert mgt, community IEC, IPC to reduce morbidity and mortality
- Conduct field investigation, epi studies & database mgt. to provide evidence for public health decision and policy
- Support case mgt, Lab services, environmental sampling and overall field ops coordination
- Sustain local capacity for disease prevention, detection and response via locals' training, mentoring, supervision
- Promote multi-disciplinary, One Health outbreak and public health emergency rapid response culture

Outbreak investigation & response

Anthrax Outbreak- Queen Elizabeth Game Park, Western Uganda: Veterinary sampling



Use of participatory epidemiology in anthrax investigation, Uganda



Outbreak of Unknown Disease- Northern Uganda: Environmental sampling



Ebola Outbreak Contact Tracing, Uganda 2012



EVD Outbreak Contact Tracing, Case Investigation, & Surveillance Mbandaka – DRC, May-June 2018



DRC 2018 EVD OBR: ACoDD and MoH Teams



Investigation in Kyavisimi



Investigation in ETU Mangina



Investigation in Mangina



Investigation and active case search in Itipo



Active case search & contact tracing



Surveillance at PoE Bende Bende - Border crossing

Team Work for Success: ACoDD teams and partners on the field in DRC – EOC, ETU, Surveillance, ERM, Data/report

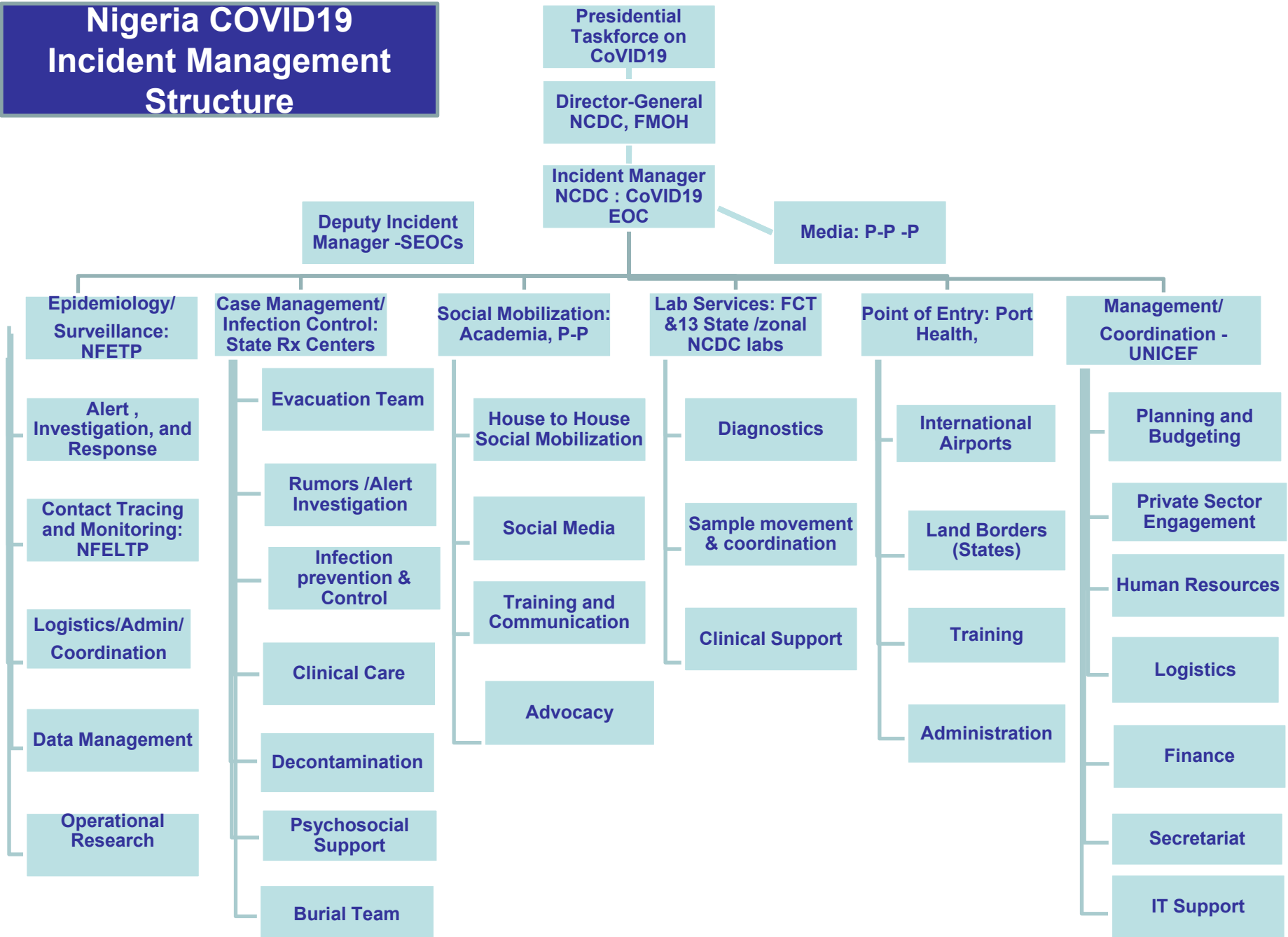


FETP One Health Teams Respond to Disease Outbreaks across Africa



Liberia, Ghana, Tanzania, Nigeria, Uganda

Nigeria COVID19 Incident Management Structure



<https://africacdc.org/covid-19/>

One Health Teams Respond to COVID19 Outbreak across Africa: Preparedness



One Health Teams Respond to COVID19 Outbreak across Africa: PUI interview



One Health Teams Respond to COVID19 Outbreak across Africa: Contact tracing



One Health Teams Respond to COVID19 Outbreak across Africa: HCW Survey



Establishing National One Health Platforms: USAID P&R Project, 2015 - 2019

USAID-DAI-AFENET: Uganda, Kenya, Tanzania

- Convening meetings of line ministries and departments
- Facilitating the development of national One Health framework
- Coordinating the development of joint OH strategic plans
- Monitoring implementation of national plans

One Health Technical Report, West African States, Senegal 2016 ... 1

- Demonstrate commitment and ownership of the One Health approach by an internal budgetary allocation dedicated to this approach and planned activities;
- Systematically enlarge FELTP to animal health and environmental health professionals and embark on a coordinated capacity-building programme
- Establish integrated surveillance systems with due consideration for human health and animal health
- Establish ICT-based platforms (cyber-surveillance) with emphasis on community surveillance to strengthen information systems within and between the human and animal sectors

One Health Technical Report, West African States, Senegal 2016 ... 2

- Establish obligatory mechanism for the maintenance of infrastructure and equipment to ensure that public health and animal health laboratories function on a permanent basis
- Institute common mechanisms in agriculture, public health and animal health sectors to jointly assess risks, regularly plan, monitor Antimicrobial resistance and apply corrective measures
- Implement One Health approach at all levels, particularly community level, placing emphasis on strengthening the technical and community engagement capacities of staff
- Promote the multi-sectoral approach with effective involvement of private sector, civil society, defence, security forces, technical and financial partners, academic institutions in OH Governance

Conclusion & Next Steps

- Traditionally, health systems are compartmentalized into silos or sectors
- No individual sector can fully address emerging health risks or threats
- Properly implemented, One Health approach will protect and save millions of lives, ensure food security, promote safe environment, facilitate economic growth
- Establishing One Health platforms e.g zoonotic disease unit in MoH will ensure coordinated OH efforts in surveillance, prevention, detection and response
- All stakeholders to continue promoting One Health approach in workforce capacity and field operations

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- Country Field Epidemiology and Laboratory Training Programs [FE(L)TPs]
- Africa Center for Disease Control
- West Africa Health Organization - WAHO
- Collaborating Schools of Public Health and Veterinary Medicine in Africa
- Emory Rollins School of Public Health –HDGH
- US Center for Disease Control & Prevention

Let us promote



One World

One Health

One Medicine