RESPOND: Development of a Global Model for University-Based Engagement in One Health

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Katey Pelican and Dominic Travis, University of Minnesota
Current Model for Outbreak Detection and Response

- First Case
- Detection
- Lab Confirmation
- Response

Cases vs. Time
Drivers of Pandemic Risk

Globalization
- Global travel: people, animals, vectors
- Global trade: animal and their products

Amplification
- Urbanization
- Population density
- Agricultural Intensification
- Technology And Industry
- Vector distribution and densities
- Transmission in health care centers
- Successful A2H, V2H & H2H transmission,

Emergence
- Human encroachment
- Exploitation
- Translocation
- Climate variability
- Vector density and distribution
- Ecological Pressure

USAID
From the American People
One Health Model: Projected Impact

- Wildlife Surveillance/Forecasting
- Early Detection
- Animal Amplification
- Human Amplification
- Control Opportunity

Different colors and icons represent:
- Red: Human Cases
- Blue: Wild Animal
- Green: Domestic Animal
Key Strategies of USAID
Emerging Pandemic Threats Program

• **Wildlife pathogen detection**: Identification of target pathogens in wildlife that threaten humans

• **Risk determination**: Characterization of the potential risk and method of transmission for specific diseases of animal origin

• **Outbreak response capacity**: Support for sustainable, country-level response

• **Risk reduction**: Promotion of actions that minimize or eliminate the potential for the emergence and spread of new disease threats

“One Health” as a lens for implementing these strategies.
RESPOND: A One Health Vision

Sustainable One Health university networks in Southeast Asia and in Africa that

- Develop and strengthen trans-disciplinary, trans-boundary approaches to
- Control emerging and re-emerging infectious diseases through surveillance and response

And offer governments

- Leadership and a transformed One Health workforce
- Ongoing One Health capacity building
- Technical support
Initial Focus of the USAID Emerging Pandemic Threats Program
One Health Central and Eastern Africa (OHCEA)

Democratic Republic of Congo
- University of Kinshasa
- University of Lubumbashi

Ethiopia
- Jimma University
- Mekelle University

Tanzania
- Muhimbili University
- Sokoine University

Kenya
- Moi University
- University of Nairobi

Rwanda
- National University of Rwanda

Uganda
- Makarere University
• Incorporated in 2012 as an NGO that may receive and disburse funds
• Central structure
  – Board of Directors
  – Secretariat
• Country structure
  – Focal Person
  – Country Coordinating Committee
  – Country Administrator
Southeast Asia One Health University Network (SEAOHUN)

Vietnam: VOHUN
- Hanoi School of Public Health
- Hanoi Medical University
- Hanoi University of Agriculture

Thailand: THOHUN
- Chiang Mai University
- Mahidol University
- Khon Kaen University

Malaysia: MYOHUN
- Universiti Kebangsaan Malaysia
- Universiti Putra Malaysia

Indonesia: INOHUN
- Institut Pertanian Bogor
- Universitas Indonesia
- Universitas Gadjah Mada
Incorporated in 2014 as a foundation that may receive and disburse funds

Central structure
  - Board of Directors
  - Chair of board rotates among 4 countries
  - Secretariat

Country structure
  - In-country office and network
  - Additional universities have been added to the in-country network; currently nearly 50 institutions
One Health Framework

- Twinning
- Regional One Health Graduate Programs
- Curriculum Co-Development

Transforming through Universities

- In Service Masters and Certificate Programs
- Continuing Education
- Work force development

Transitioning through cross-sectoral engagement

- Field based training
- Community engagement and problem solving
- Community worker training

Broadening to improve outbreak response
A One Health Continuum

From Core Competencies to National and Regional Activities
# One Health Core Competency Domains

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<th>GLOBAL</th>
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Using the OHCC Domains

Identified OHCC learning needs can be fulfilled by learning/teaching units that can be integrated into appropriate segments of an existing curriculum.
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<th>Vietnam</th>
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<td>CMU Nursing Mahidol CMU Vet</td>
<td>HSPH UA Vet Namdinh HMU</td>
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Map, review and revise - examples

• OHCEA
  – Wildlife health programs (MakU)
  – Socio-economics and gender (MakU)
  – Veterinary curriculum (U of Nairobi)

• SEAOHUN
  – National workshops in all 4 countries, Dec ‘14
  – Vietnamese veterinary curriculum
Wildlife Investigation and Livestock Disease in Public Health (WILD)

• Brings together decision-makers and field personnel from relevant government agencies – Ministries of Agriculture, Health and Environment – for transdisciplinary learning

• Raise awareness, create connections, develop champions

• Developed by FAO, RVC, picked up by AU-IBAR
Out of the office
Develop new courses, workshops

• OHCEA
  – Regional One Health leadership ToT
  – Gender and One Health short course (MakU)
  – UoN Veterinary adding One Health course
  – Incubating a Masters in Veterinary Public Health with a One Health focus (NUR-N)

• SEAOHUN
  – PBL casebook for One Health (MyOHUN)
  – One Health in One Day (ThOHUN)
  – One Health ToT
  – SEAOHUN One Health modules
SEAOHUN One Health Modules

- One Health concepts and knowledge
- Management
- Communication and informatics
- Culture, beliefs, values and ethics
- Leadership
- Collaboration and partnership
- Systems thinking
- Policy, advocacy and regulation

- Epidemiology and risk analysis
- Fundamentals of infectious disease
- Infectious disease management
- Public health
- Behavior development
- Ecosystem health
- One Health economics

Facilitator guide, student guide, slide deck, and references
SEAOHUN One Health Modules

- Adaptable to a variety of target learners
- Novel teaching methods
- “Buffet” of materials, lessons, resources
One Health Core Competency Domains

- Domains are stable yet flexible
- Framework for dialogue, planning, and collaboration
- Developing the Core Competency domains helped build the networks, using them is strengthening the networks
One Health in the ‘Real World’

How field based, experiential training programs are creating a new kind of health professional
One Health: A Revolution in Education

- New methods in the classroom
- Real life work and field-based training
- New skills and career paths
- New Partnerships
  - Community
  - Government
One Health: A Revolution in Education

• Real life work and field-based training

• New skills and career paths
Immersion Policy Courses

Engaging Intergovernmental Organizations - EU

Enabling collaboration among tomorrow’s One Health leaders

Workshop participants at Makerere COVAB
Graduate training based on Real Life Work

MPVM graduate students participate in ecology study on Brucellosis

One Health residents meet Ambassador

L-R: Mac Farnham (UMN Assistant Professor), Shamilah Namusisi (Resident & Veterinarian), Scott DeLisi (U.S. Ambassador), Muwanguzi David (Resident & Veterinarian), Jacinta Mukulu Walla (Resident & Nurse)
Field-based Courses
Create and Mentor One Health Student Clubs

First in Rwanda - over 100 students from 5 disciplines.

i. To support the One Health Initiative through organized involvement and collaboration with the environmental, public, and animal health communities.

ii. To strive to improve communication, encourage collaboration, and enhance integration of animal, human, and environmental health for the benefit of all.

iii. To support programs that endeavor to reduce human and animal disease and disability and improve human and animal population well-being.
Joint Field Attachments and Field Experiences
Tanzania - STUDENTS

- Veterinary Medicine – 5
- Animal Science and Production – 3
- Human nutrition – 3
- Wildlife management - 5
- Biomedical and laboratory sciences – 6
- Human medicine – 5
- Nursing – 5
- Environmental health – 5
DR Congo- Kisantu Bas Congo

- Students in field Sept 13-20
- Rabies intervention
  - 252 dogs, 10 cats vaccinated
- Tabletop simulation exercise with the participation of Provincial Ministers of Health and Environment and several high level officials.
Uganda
New Skills and Career Paths

Social Entrepreneurship

Economic Value Proposition and Social Value Proposition

1. What’s the problem?
2. Who is your customer?
3. How do you make money?
4. Why will people buy it?
5. What’s your solution?
6. Validate and iterate.
SITE:  BWERA; KASESE DISTRICT

DATE: 14th April – 12th May 2013

A PROJECT IMPLEMENTATION REPORT TO REDUCE THE BURDEN OF BILHARZIA IN KAYANZI FISHING COMMUNITY
Students (holding the poster) teaching fishermen in Kayanzi village in Kasese district about bilharzia.
Student business ideas

• Bilharzia control/prevention
• Clean slaughter
• Lumpy Skin Disease vaccination
• Animal diagnostics
• Nutritional supplements to mitigate post-harvest food loss and improve food security
• Fuel from waste briquettes
• Bio Sand Filters for water
Thailand One Health Field Experience

1. Originally a tropical medicine parasitology course based on identification and facts
2. After GHI, changed to more hands on problem based learning course
3. After UMN discussions, changed to multidisciplinary, multi-university field experience
Thailand One Health Field Experience

- Veterinary medicine, tropical medicine, public health
- Graduate students and faculty members
- 5 universities and 4 villages
- Initial group “game plans”
- Introduction to One Health
- Surveys, sample collection, sample testing, synthesis of findings, teaching children
Outcomes

• Students with skills to succeed in workforce.
• A workforce that fosters a SUPER TEAM approach
• Improved capacity across sectors to manage health threats that cross human, animal and environmental disciplines including emerging pandemic disease;
• A closer synergy between government, country and community needs and university-based research, education and outreach activities.
One Health Demonstration Sites

Building a Community of Practice and Experiential Learning
• **It is a place**
  • Animal, human, environmental interface
  • University/community/ministry/private sector engagement
  • University (research, service and training) connection in the community
    – Akin to NA paradigm of ‘extension’
  • Focus on building capacity and meeting needs in designated communities
  • Long-term engagement
    – Sustainability planning
Demo site components

• Potential components:
  – Multidisciplinary field-based education programs
  – Collaborative problem identification and intervention development
  – Systems-based, outcome oriented research
  – Strengthen district animal, environment, human health services and connectivity

• Social entrepreneurship models
Community outreach and experience

Students and community leaders exchange ideas during the attachment training
OCHEA Proposed Sites

• DRC: Lake Tshangelele
  – Fishing villages
  – Wild bird flyover site
  – Mining contamination—food insecurity
  – On hold due to insecurity

• Uganda: Kasese District
  – Queen Elizabeth park; wildlife
  – Fishing, pastoral agro
  – Flood zone
  – DRC border: trade, migration

• TZ: Kilosa district
  – Mikumi park; wildlife
  – Pastoral-agro community
  – Flood zone
Uganda Case Study: Queen Elizabeth National Park
Ecosystems landscape as a demonstration site

- It is a biosphere reserve where both human activities and conservation take place
- Ecology - aquatic and terrestrial ecosystems
- The oil industry is being established and a major highway is being established in the park.
- Prone to several outbreaks such as Anthrax and Marburg
- Exploit a wide range of health issues including those in pastoral communities, in fishing villages, travel medicine issues
- Border with DRC where transboundary health issues are a significant
Students carrying out meat inspection at a local meat slaughter slab: Note that animals are slaughtered on the ground which increases contamination
Post Flood Assessment
Anthrax Research in QENP
One Health Leadership in service training

• Four cornerstones: Communication, Visionary and strategic, Team building, Change management

• Resulted in One Health District Plans
THAILAND: Next Step- One Health Villages

- University wide “social responsibility”
- Near new Dawei development project
- Community selected issues
- Practical training
- Research opportunities
- Community benefits
- Multidisciplinary teams of students and faculty members
Leveraging RESPOND

- IDRC ecohealth chair proposals
- NIH collaborative research center grants
- NIH Fogarty
- NSF coupled human-natural systems
- OIE twinning
- Tufts – Rwanda ambulatory medicine clinic
- UMN – IonE research platforms
- Students- Dorris Duke, Fogarty, Veterinary summer, EcoHealthNet
- etc
CONSERVATION & ECOSYSTEM HEALTH ALLIANCE
P.O. BOX 34153, KAMPALA
HOIMA OFFICE
OLD PRODUCTION DEPARTMENT BLOCK
LOCATED BETWEEN RDC'S & REGIONAL POLICE OFFICE
POST OFFICE ROAD HOIMA
ECO HEALTH RESEARCH GROUP
Acknowledgements

• Represents a conceptual implementation plan for relatively common idea
  – Who ‘owns’ an idea?
  – Chosen ‘brand’ for communication purposes

• Represents a vast network of people, culture, expertise and ideas to credit