International Emerging Infections Program
A Program to Build Capacity to Address Emerging Infections in Africa

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What is the CDC-Kenya International Emerging Infections Program?
Started—June 2004

- Part of a global strategy to monitor for and respond to emerging infectious threats (local, regional, global)

- Establish diagnostic and epidemiologic capacity in Kenya to address diseases of epidemic potential

- Conduct public health research of national, regional, and global importance

- Contribute to development and widespread use of effective interventions to address high impact diseases
Program Cornerstones

- Surveillance
- Outbreak response
- Training/building local and regional capacity
- Applied research
IEIP Labs

- Two new BSL3 Labs
- Dr. M. Kariuki Njenga, Head
- State-of-the-art laboratories in proximity to problems specific to the developing world
- Supports
  - Training
  - Outbreak investigations
  - Surveillance (including IDSIR)
Building Epi and Lab Capacity
Field Epidemiology and Laboratory Training Program

• Degree granting public health program for MoH staff
  – MSc in applied epidemiology or lab management

• Currently in 5th cohort
  – Thirteen graduates of program back working for Kenya MoH
  – 20 current residents from five countries
Surveillance

Major Components

- Population-based
  - Kisumu (rural, w. Kenya) (community)
  - Nairobi Slum (Kibera) (community)
  - Bondo District (hospital based)
- National reporting system
  - Utilizing IDSR
- Sentinel hospital surveillance (flu)
- Refugee camp surveillance
- CDC-Kisumu health and demographic surveillance system
- “Phones for Health”
Population-based Surveillance Objectives

• Identify and characterize potentially important “new or emerging” pathogens
• Establish public health priorities in rural and urban settings
• Provide platform for evaluating impact of interventions to address leading causes of priority diseases
Population-based Surveillance Community Systems

• 55,000 people in two sites (rural-25,000 and urban Kibera 30,000)
• Visit each household every two weeks
  – Ask about episodes of pneumonia, diarrhea, fever, and jaundice
• Establish enhanced field clinic
  – Free and high quality care
• Diagnostic and treatment algorithms
• Specimens obtained according to protocol and tested in the lab
  – Define principal causes of priority diseases
    • Pneumonia
    • Diarrhea
    • Fever
    • Jaundice
Data Collection Facilitated by PDAs
Diarrheal Disease Surveillance in Two Population-based sites
Febrile Surveillance

- All patients with temperature >38.5°C
  - Blood culture
  - Malaria blood smear
- Results linked to household and clinical
Animal and Human Health
Examining the Relationships

• Relationship between incidence of human zoonotic diseases and pathogen infection dynamics in domestic animal populations

• Prevalence and incidence of zoonotic diseases in co-existing human and animal populations

• Potential of animal sentinel populations to provide predictive ‘signals’ of human zoonotic diseases

• Risk factors for human zoonotic cases

• Risk factors for infection of domestic animal populations
Animal and Human Health
Pathogens for Initial Focus

• Ruminant livestock: *Brucella* spp., *Leptospira* spp., *Coxiella burnetii*, Rift Valley Fever (RVF), *Listeria monocytogenes*, Influenza A, Congo-Crimean Haemorrhagic Fever (CCHF)

• Poultry: Influenza A, West Nile Virus, CCHF, *Campylobacter* spp., *Listeria monocytogenes*

• Pigs: Influenza A, *Brucella* spp., anthrax, *Leptospira* serovars; *Bacillus anthracis*, Hepatitis E virus

Animal and Human Health Collaborating Team

- Darryn Knobel
- Jo Halliday
- Sarah Cleaveland

Royal (Dick) School of Veterinary Medicine, University of Edinburgh and KEMRI-CDC (visiting scientists)
IEIP-Kenya Program Staff

• Robert Breiman, Director
• Heather Burke, Dep Director for Operations
• Daniel Feikin, Epi Chief
• M K Njenga, Lab Chief
• Joseph Oundo, Dep Lab Chief
• Beatrice Olack, Godfrey Bigogo-Field Supervisors
• Solomon Gikundi, Ben Ochieng, Geoffrey Jagero-Lab supervisors
Identify threats to health and well being
Establish priorities for public health programs and research
Develop and evaluate safe, practical tools to contribute to the wellness of people in impoverished settings in Africa and developing countries elsewhere
What is an Emerging Infection?

A human infectious disease with \( \geq 1 \) characteristic:

- Newly appeared or is newly recognized
- Has become more:
  - Difficult to treat (i.e. drug resistance)
  - Commonly occurring (increased incidence)
  - Widely distributed geographically (i.e. West Nile) or demographically
  - Severe/lethal
- New complication
- New mode of transmission
- Substantial epidemic potential (occurs in “bursts”)
- Threatens regional or global health