Disease Prevention, Detection & Response During Public Health Emergencies

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Global Disaster Relief Summit

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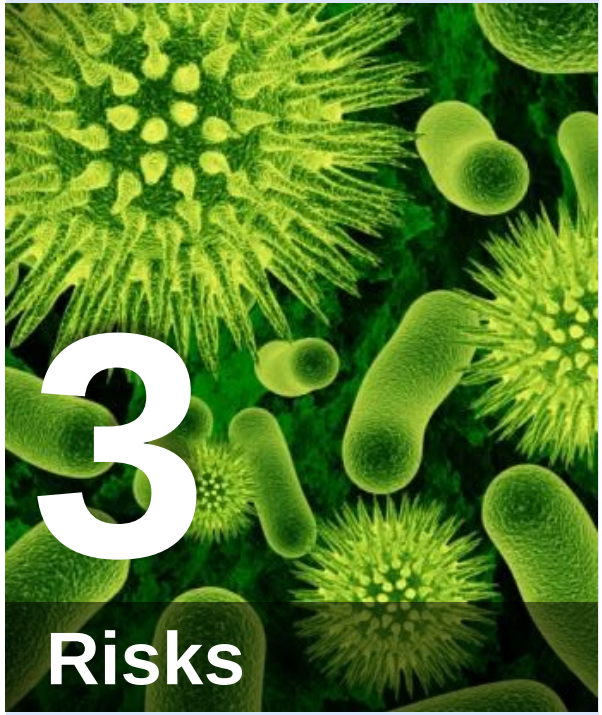
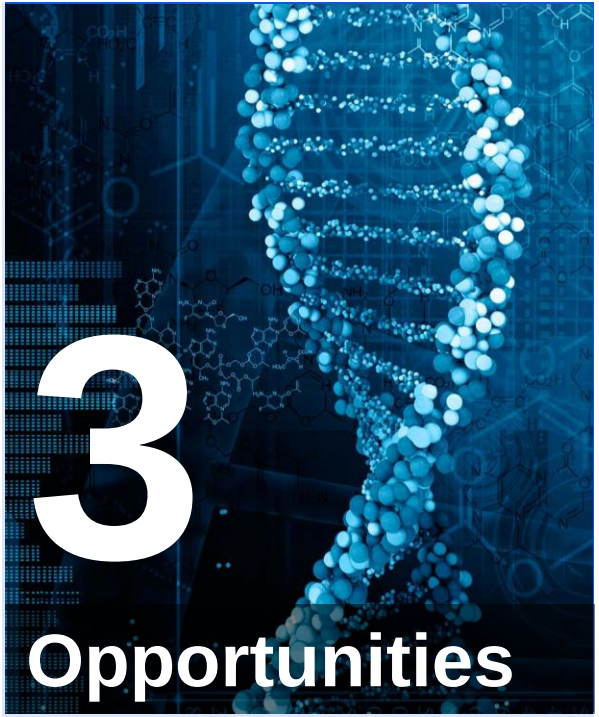
GLOBAL HEALTH SECURITY



3 Risks

- Emerging organisms
- Drug resistance
- Intentional creation



3 Opportunities

- Public health framework
- New lab/surveillance tools
- Successful outbreak control

3 Priorities

- Prevent wherever possible
- Detect rapidly
- Respond effectively

A HEALTH THREAT ANYWHERE IS A HEALTH THREAT EVERYWHERE

Source: Kilpatrick & Randolph. Lancet 2012;380:1946-1955.
Note: Air traffic to most places in Africa, regions of South America, and parts of central Asia is low. If travel increases in these regions, additional introductions of vector-borne pathogens are probable.

PUBLIC HEALTH EMERGENCY PREPARDENESS AND RESPONSE PROGRAMS AT CDC

MOST OF THE WORLD IS STILL UNPREPARED

Fewer than 1 in 3 countries self-reported being fully prepared for outbreaks as of 2014

GLOBAL HEALTH SECURITY AGENDA

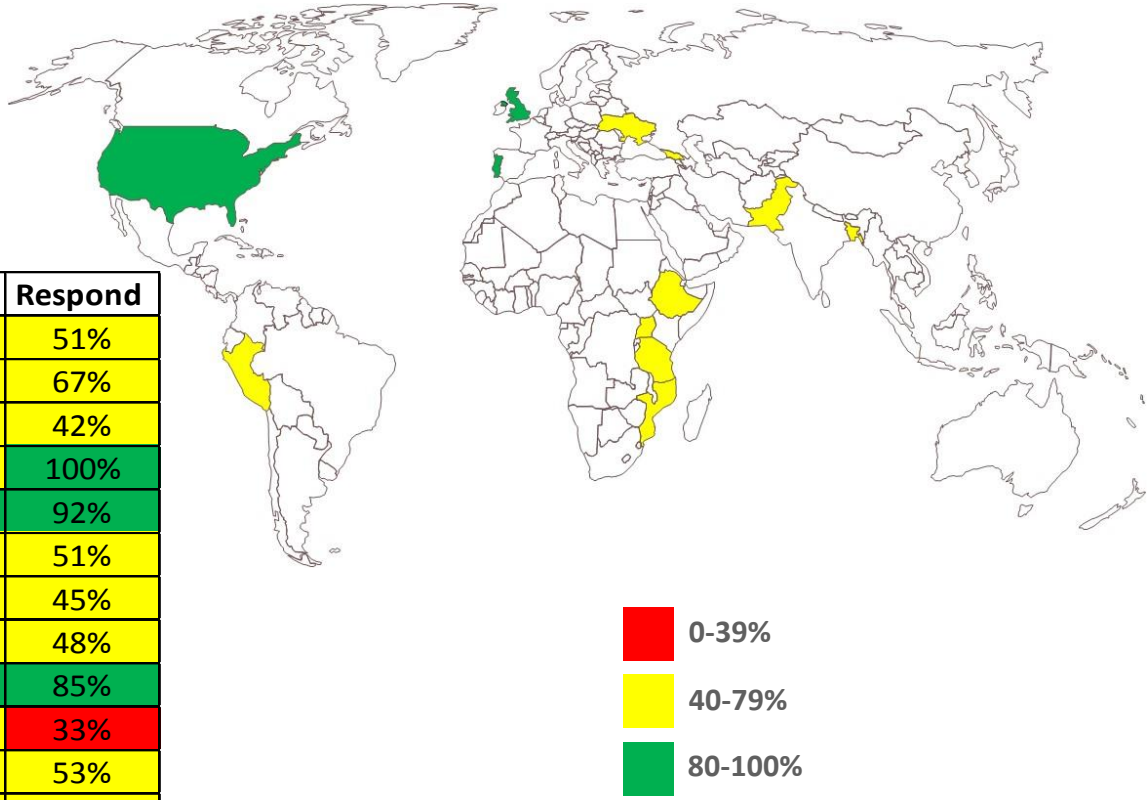
Goals and objectives

Goals	Objectives
Prevent avoidable epidemics	▪ Establish surveillance to monitor and slow the spread of antimicrobial drug-resistant organisms ▪ Develop policies and practices that reduce the risk of zoonotic disease transmission ▪ Promote national biosafety and biosecurity systems ▪ Immunize against epidemic prone diseases, including 90% coverage of children under age one with a measles-containing vaccine
Detect threats early	▪ Strengthen national laboratory systems, including specimen referral networks for at least 5 pathogens in at least 80% of the country ▪ Strengthen interoperable networks for real-time biosurveillance ▪ Surveillance for at least three priority syndromes ▪ Promote practices for rapid, transparent disease reporting to WHO, Food and Agricultural Organization and World Organization for Animal Health ▪ Train and deploy an effective public health workforce including at least one trained field epidemiologist per 200,000 population
Respond rapidly and effectively	▪ Develop Emergency Operations Centers and functional Incident Management systems able to operate within 120 minutes of activation ▪ Promote multi-sectoral emergency response; linkages between public health and law enforcement ▪ Improve global access to medical countermeasures and health personnel during health emergencies

JOINT EXTERNAL EVALUATIONS

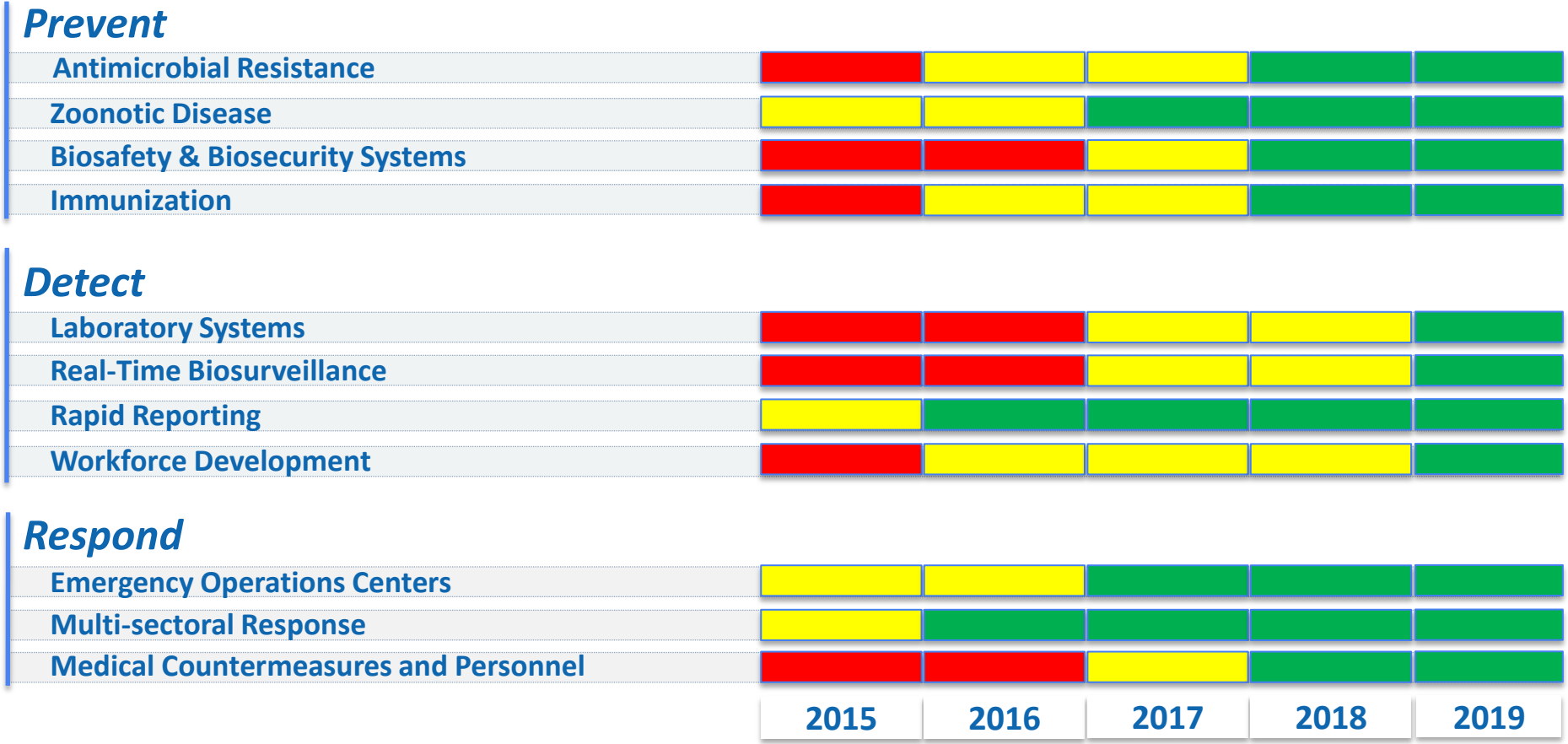
Transparent, independent, and objective

Country	Overall	Prevent	Detect	Respond
Georgia	65%	72%	68%	51%
Peru	67%	59%	76%	67%
Uganda	55%	44%	77%	42%
Portugal	88%	88%	79%	100%
United Kingdom	96%	97%	98%	92%
Ukraine	55%	58%	54%	51%
Ethiopia	52%	56%	59%	45%
Tanzania	50%	51%	54%	48%
United States	87%	87%	91%	85%
Bangladesh	50%	58%	70%	33%
Pakistan	50%	46%	51%	53%
Mozambique	47%	46%	51%	46%



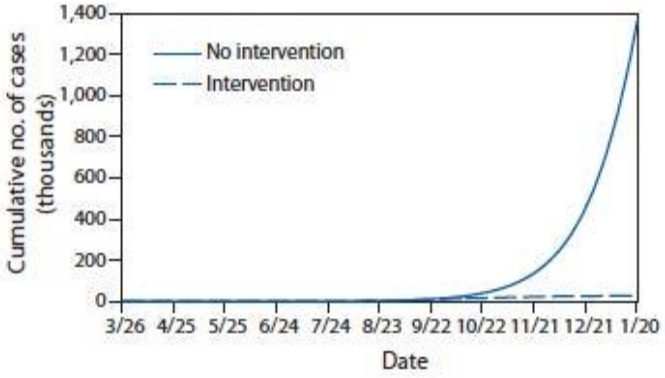
GHSA IMPACT OVER 5 YEARS

Potential assessment progress, sample country

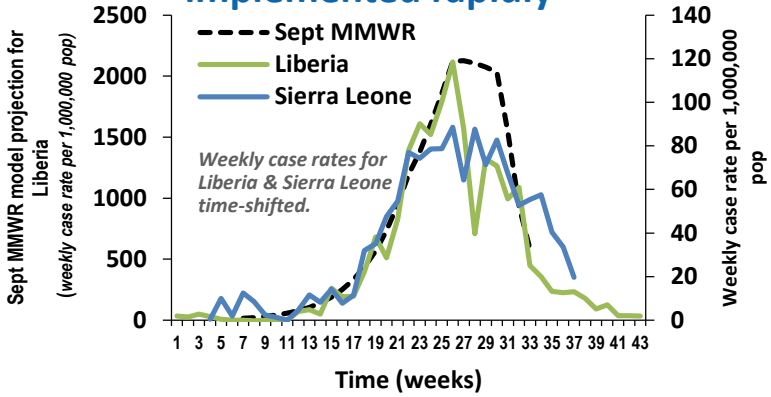


EBOLA: WHAT MIGHT HAVE BEEN

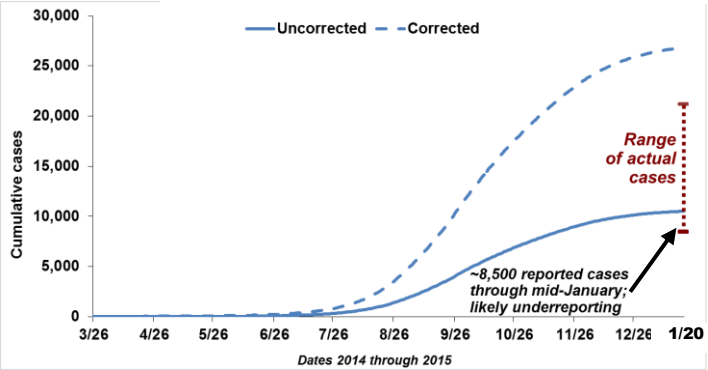
Modeling projected exponential increase without intervention



Modeling predicted rapid rise in cases – and rapid decline if interventions implemented rapidly



With intervention modeling matched events closely

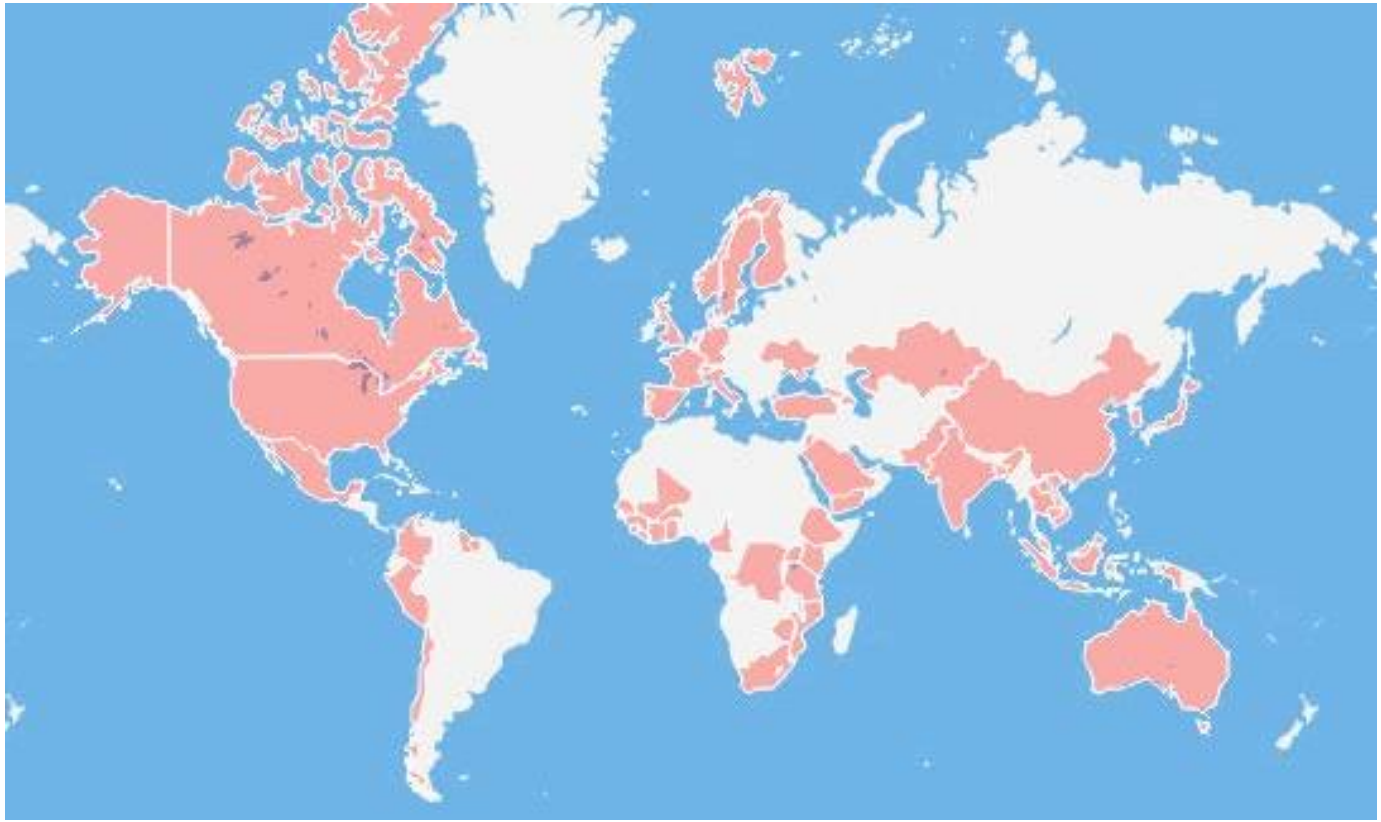


If Ebola had not been stopped in Lagos, it likely would have spread for months or years to many other areas of Nigeria and Africa, killing hundreds of thousands of people and setting back a decade of progress

Nigeria	
Contacts identified	894
Home visits of contacts	19,000
Number of cases (from index case)	19

GLOBAL HEALTH SECURITY AGENDA

70+ partner countries committed to a safer and healthier world



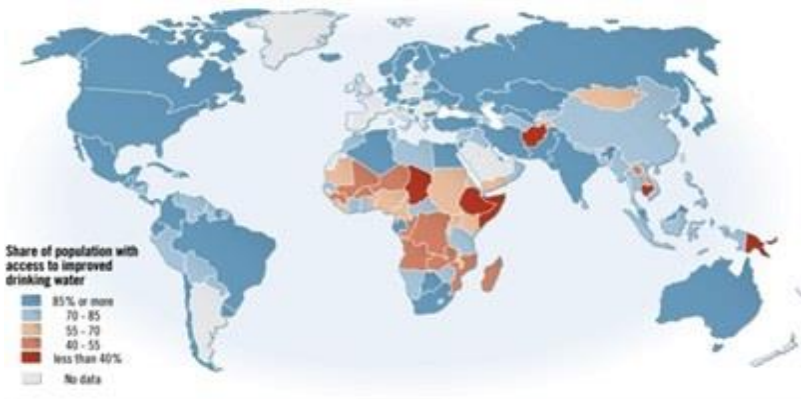
GHSA HAS STRENGTHENED MALI'S CAPACITY TO PREVENT, DETECT, AND RESPOND

- CDC assistance has enabled national labs to diagnose Zika, chikungunya and dengue – and continue to diagnose influenza and meningitis
- Tracking systems in place for Zika, meningitis, influenza, Lassa fever, other dangerous diseases
- Hundreds of front-line health care workers being trained to identify and report infectious diseases
- New national EOC has overseen successful rapid responses to reports of suspect Ebola cases and meningitis
  - Meningitis vaccination campaign conducted within one week of detection of outbreak
  - Imported case of vaccine-derived polio virus detected by CDC-trained Malian staff; contact tracing & vaccination campaign rapidly initiated
  - Imported case of Ebola rapidly detected and contained

Using protective equipment to prevent infections while screening patients for Ebola

WATER, SANITATION, AND HYGIENE

- Waterborne and water-related diseases (principally diarrhea) are the second leading cause of childhood deaths worldwide
  - Cholera increase at least partially due to climatic factors and increased insecurity



- Access to safe water/sanitation may be extremely limited for populations affected by humanitarian crises (e.g., refugee camps)
  - Overuse of existing water resources, and potentially climate change, are likely to increase vulnerability in access to safe water
  - Also increased need for WASH sector involvement in PH emergency response (e.g., Ebola) as well as in humanitarian crisis response

CDC'S ROLE IN WASH INITIATIVES

- CDC focus is on reducing health impact of natural disasters, displacement, and disease outbreaks.
  - Emphasis on strengthening collection and use of data to ensure decisions are evidence-based to extent possible in emergency settings
- Examples of CDC emergency WASH activities include
  - Tanzania: Evaluating bulk chlorination in cholera-affected areas to increase access for households without network connections
  - Haiti: Household survey completed to identify gaps in access to safe water in preparation for a rise in cases of cholera
  - FETP: New WASH sector program to improve collection, analysis, and interpretation of WASH-related data during humanitarian crises

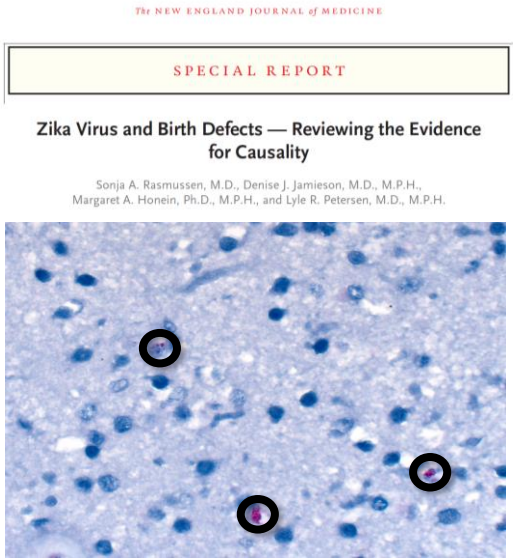
COMMUNITY HEALTH RESILIENCE

- Lack of health system resilience is a primary contributing factor to the magnitude and impacts of outbreaks, epidemics, and natural disasters
- Weak health systems have little internal resilience to respond to or recover from such events (e.g., earthquake/cholera in Haiti, Ebola in West Africa)
- GHSA designed to build health resilience in communities by strengthening systems to prevent, detect, and respond to infectious diseases

Children discharged from Ebola treatment center, Apr. 29, 2016, Liberia

ZIKA VIRUS IS A PUBLIC HEALTH EMERGENCY

- Zika is the latest in a series of unpredicted & unpredictable health threats
  - Unprecedented, extraordinary complexity & unique challenges
  - We learn more every day
  - Serious problem requiring urgent action
- Top priority: protect pregnant women & pregnancies
  - For first time in >50 years, a virus has been linked to microcephaly, other serious birth defects, and poor pregnancy outcomes
  - Also associated w/ Guillain-Barré syndrome
- The sooner we act, the better we can protect


The NEW ENGLAND JOURNAL of MEDICINE

SPECIAL REPORT

Zika Virus and Birth Defects — Reviewing the Evidence for Causality

Sonja A. Rasmussen, M.D., Denise J. Jamieson, M.D., M.P.H., Margaret A. Honein, Ph.D., M.P.H., and Lyle R. Petersen, M.D., M.P.H.

Range of *Aedes aegypti* mosquitoes in US

ZIKA: PREVENTION, DETECTION, RESPONSE

Prevention

- Reduce risk to pregnant women
- Mosquito surveillance and control in at-risk and affected areas
- Minimize other forms of transmission (transfusion, organ donation, sexual)

Detection

- Real-time information on infections, adverse health outcomes, mosquito populations and resistance
- Improve laboratory test availability and accuracy (RT-PCR; serology; PRNT)

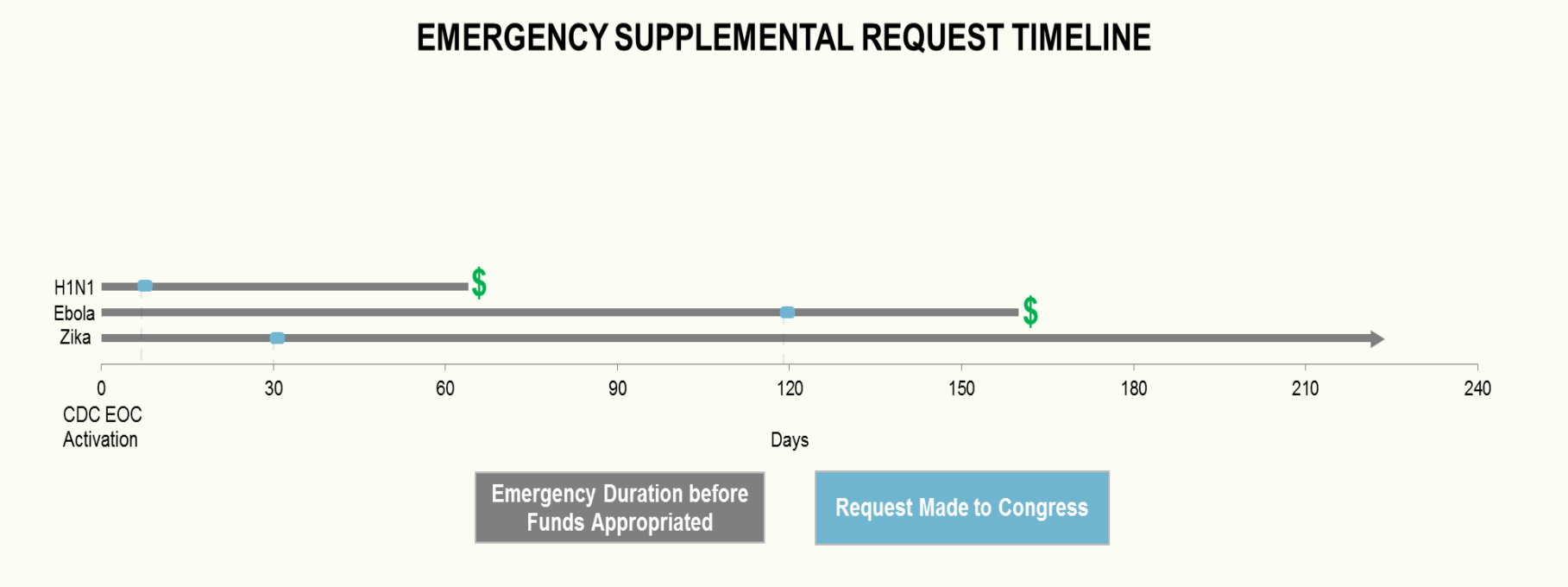
Response

- Robust response in any area with or at risk for local transmission
- Improve vector surveillance and control
- Care for pregnant women, affected infants, patients with Guillain-Barré syndrome

EMERGENCY FUNDING

- Speed is critical in a public health emergency
  - Time lost fighting Ebola because immediate funding not available
  - Losing time against Zika for same reason
  - Transfers from other programs endangers health and is not sustainable
- Resource for infectious disease emergency response
  - Mechanisms and money established in advance
  - Minimizes need for emergency requests
  - Allows immediate focus on response
  - Both funds AND authorities are essential

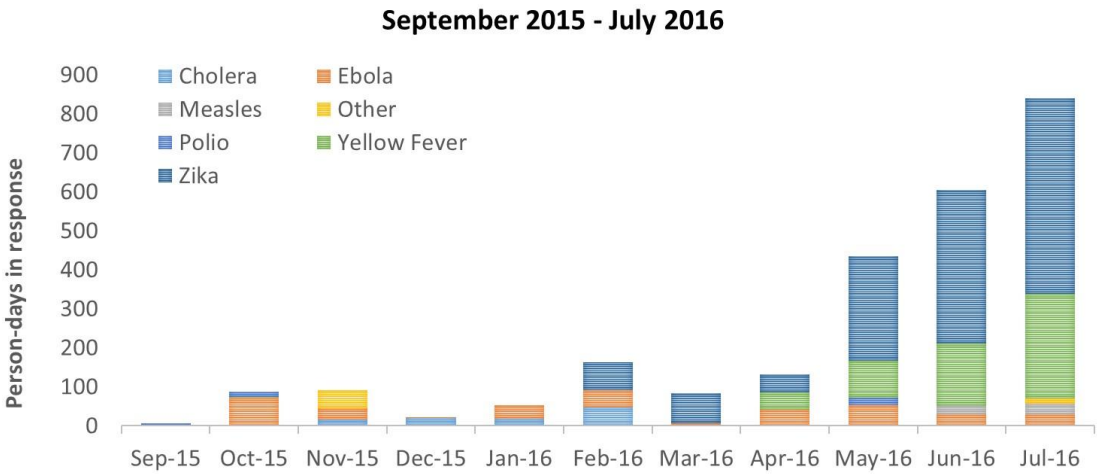
TIME BETWEEN CDC ACTIVATION AND CONGRESSIONAL APPROPORIATION



GLOBAL RAPID RESPONSE TEAM

Enhancing CDC's global emergency response capacity

- Deploy rapid response teams to the field within 24-48 hours
- Provide stable, long-term staffing for emergencies
- Serve as counterpart for USAID OFDA
- Assist partner countries to achieve IHR compliance
- Interim solutions for global CDC staffing gaps



Reached 1,000 cumulative person-days in response in May 2016
Reached 2,000 cumulative person-days in response in July 2016

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov