Improving the Response to Public Health Emergencies

National Disaster Epidemiology Workshop
Council of State and Territorial Epidemiologists
May 13, 2015

RADM Stephen C. Redd, MD
Director, Office of Public Health Preparedness and Response (OPHP), CDC
scr1@cdc.gov       @DrReddCDC
10+ years of responding to public health emergencies

- Planning
- Emergency operations centers
- Adaptability
- Right amount of structure
- Role of science
- Risk communication is a core discipline
BIRD FLU

2005–2009 Planning
Headlines, 2006
National Strategy Pandemic Plans

- National Strategy for Pandemic Influenza
- National Strategy for Pandemic Influenza: Implementation Plan
- HHS Pandemic Influenza Plan
- HHS Implementation Plan
CDC Influenza Pandemic Operations Plan
Training and Exercise Plan

Training/Exercise Methods Include:
- Briefings/Seminars
- Tabletop Discussion (informal walk-thru and discussion)
- Workshops and Functional Drills (step-by-step rehearsal by phases/stages)
- Full Scale Exercises

Senior Leader OPLAN Seminar
28 Sep

DEOC Working Level Workshop
4 Oct

Division Director, CIO OPLAN Seminar
17 Oct

Basic Functional Level Drills (6 Functional Areas)
27 Oct – 1 Dec
2-4 Hours Each

Advanced Tabletop: Preparation for Full Exercise
8 Dec (Half Day)

Functional Exercise – Internal, Full Staff
31 Jan-1 Feb 07

Full Scale Exercise – Internal/External
April 07 (72 Hrs)

Final AAR & Report

Functional Exercise – Internal / External
Aug 07 (72 hrs)
May 2006
H5N1 cluster
Indonesia

March 2007
US traveler
New York

Dec 2007
Pakistani traveler
New York
Pre-H1N1 Exercise Highlights—the EOC

- Organization of leadership team
- Span of control
- Established daily rhythm
- Communication with state health departments
- Structured decision making
- Fusion meeting
Capabilities Developed to Prepare for an Influenza Pandemic

- Surveillance plans
- Diagnostic test development / deployment
- Vaccine development / deployment
- Antiviral stockpiling / guidance development
- Community mitigation measures
  - School closure guidance
  - Planning for airport screening
- Infection control guidance
- Communication planning and training
Detection of Novel Swine Influenza

- **First case**—April 15, 2009
  - 10 year old boy
  - Identified as part of a clinical trial of a prototype diagnostic device
- **Second case**—April 17
  - 9 year old girl
  - Identified as part of CDC border flu surveillance
- **MMWR Dispatch**—April 21
- **Texas cases**—April 22
- **Mexico cases**—April 23

Southern California, US
Estimated H1N1 cases by week, 2009-10

Week

Estimated Cases

0  1,000,000  2,000,000  3,000,000  4,000,000  5,000,000  6,000,000  7,000,000  8,000,000

10/3  10/17  10/31  11/14  11/28  12/12  12/26  1/9  1/23  2/6  2/20  3/6
Estimated H1N1 Cases and Vaccine Doses Distributed, 2009-2010

Cases and Doses Distributed

Week

vaccine doses

cases

0 2,000,000 4,000,000 6,000,000 8,000,000 10,000,000 12,000,000 14,000,000
Characteristics of 2009 H1N1 Influenza Pandemic in the US
April 15, 2009–April 10, 2010

Deaths
12,470 (8.9K – 19.3K)

Hospitalizations
274,000 (195K – 403K)

Cases
61,000,000 (43M – 89M)

Approximate rate per 100,000 population

Age groups
0-4 5-24 25-49 50-64 ≥65
2009 H1N1 Achievements

- Rapidly identified novel influenza virus
- Developed and distributed diagnostic reagents within weeks of detection
- Vaccinated approx 80m US residents
- Increased use of antiviral drugs for severely ill
H1N1

2009–2010 Response
2014–15 Ebola Outbreak
History of Ebola

- Discovered in 1976 near the Ebola River in the Democratic Republic of the Congo
- Family of zoonotic RNA viruses
  - Filoviridae
- Historically, death rates reached 50%-90%

- 2014-2015 largest Ebola epidemic in history
- CDC’s response is the largest international outbreak response in CDC’s history
Daily Epi Curve

Epi Week 15-18*

- Guinea
- Liberia
- Sierra Leone
- Guinea EpiWeek Avg
- Liberia EpiWeek Avg

Number of Confirmed Cases

CDC Week 15
CDC Week 16
CDC Week 17
CDC Week 18*
WHO Week 16
WHO Week 17
WHO Week 18
WHO Week 19*
Sierra Leone Ebola Dashboard

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*Partial week reported
Comparison of Positive Results to Total Samples

![Graph showing comparison of positive results to total samples over Epi Weeks 1 to 18.](Image)

*SitRep Data, Last Updated: May 8, 2015*
The Ebola outbreak in Liberia is over

WHO statement
9 May 2015

Today, 9 May 2015, WHO declares Liberia free of Ebola virus transmission. Forty-two days have passed since the last laboratory-confirmed case was buried on 28 March 2015. The outbreak of Ebola virus disease in Liberia is over.
Domestic Challenges with Ebola

- Imported case
- Infection of health care workers
- Infection of returning health care workers
CDC Entry Screening and Follow-up in the U.S.

Screening  Movement and Monitoring  Hospital Preparedness

What is contact tracing?
Contact tracing can stop the Ebola outbreak in its tracks.

Contact tracing is finding everyone who comes in direct contact with a sick Ebola patient. Conasus are watched for signs of illness for 21 days from the last day they came in contact with the Ebola patient. If the contact develops a fever or other Ebola symptoms, they are immediately isolated and the cycle starts again.

Even one missed contact can start a new outbreak.

Preventing Ebola by Screening Travelers.

West Africa EXIT screening
All travelers leaving Guinea, Liberia, and Sierra Leone will be screened before getting on their flight.

United States ENTRY screening
Travelers coming to the US from countries with Ebola outbreaks (such as Guinea, Liberia, and Sierra Leone) flie into one of the following airports for entry screening:
New York JFK, Newark, Washington-Dulles, Chicago O’Hare, and Atlanta.

CDC EBOLA GUIDANCE
Evaluating Level of Risk

- **HIGH RISK**
  - Direct contact with blood or body fluids from a person showing symptoms of Ebola while not wearing PPE.
  - Living with and caring for a person showing symptoms of Ebola.
  - Direct contact with a dead body while in a country with a large Ebola outbreak or a small outbreak that may be hard to control without wearing PPE.
  - Direct contact with blood or body fluids from a person showing symptoms of Ebola through close contact, nose or mouth, through tissues in the eye or through a needle stick.
  - Prescribing blood or body fluids from a person showing symptoms of Ebola without receiving PPE or undertaking standard precaution measures.

- **SOME RISK**
  - Close contact (less than 3 feet) for a long time with a person showing symptoms of Ebola while not wearing PPE.
  - Direct contact while in a country with a large Ebola outbreak or a small outbreak that may be hard to control with a person showing symptoms of Ebola while wearing appropriate PPE.

- **LOW RISK**
  - Having been in a country with a large Ebola outbreak or a small outbreak that may be hard to control within the past 21 days.
  - Having had contact with someone showing symptoms of Ebola while not wearing PPE.
  - Being in the same room with a sick Ebola patient.

- **NO RISK**
  - Contact with a person with Ebola or with someone who might have been exposed to someone who has just traveled to a country with an Ebola outbreak or a small outbreak.
  - Having been on an aircraft or ship with someone who has just traveled to a country with an Ebola outbreak or a small outbreak.
  - Having been in a country with a large Ebola outbreak or a small outbreak that may be hard to control.
  - Contact with a healthy person who has just traveled to a country with an Ebola outbreak or a small outbreak.
  - Having been on an aircraft or ship with someone who has just traveled to a country with an Ebola outbreak or a small outbreak.

CDC.gov/ebola
HHS and States Build a National Network of Ebola Treatment Centers
Adaptations to initial Ebola plan

- **Multiple interventions in highly affected countries**
  - Treatment units
  - Community treatment units
  - Burial teams
  - Social mobilization efforts

- **U.S. domestic Ebola plan**
  - Changes in PPE recommendations
  - Airport screening
  - Movement and Monitoring
  - Rapid Ebola Preparedness visits
Pre-Earthquake Public Health

Worst indicators in Western Hemisphere

- Under 5 mortality ~ 1 in 10
- Maternal mortality estimated at 600/100,000 births
- Limited public health capacity—low vaccination rates, poor water and sanitation infrastructure
Impact of the Earthquake on Haiti

- Hospitals and clinics damaged
- Over 200,000 killed
- Over 300,000 injured
- An estimated 2,000,000 displaced
- Ministry of Health facilities destroyed
Emergency Response

- WHO Health Cluster initiates coordinated response
  - Initial Rapid Assessment
  - Priorities identified (i.e. shelter, water, food, bed nets, access to health care and medicines)

- Gather available Information
  - Previous targeted surveys by partners
  - Existing CDC Haiti Office

- Surveillance for reportable diseases
  - National Sentinel Surveillance System (NSSS) as of Jan 25, 2010
  - Notifiable diseases at health facilities – immediate and daily

Photo by US Air Force (http://www.flickr.com/photos/usairforce/4296235679/)
Reported Number of New Cases of Cholera (N=91,770), by Hospitalization Status

Haiti, October 20 – December 3, 2010

* Because of time delays in reporting, case counts for the most recently reported days likely are underestimated.
CDC Response in Haiti

- Established national surveillance system with partners
- Trained ~ 10,000 workers by March 2011
- Developed and distributed prevention messages
- Leveraged in-country resources to increase treatment centers and oral rehydration points
- Efforts to improve WASH
7 Main Public Health Goals in Haiti

1. Support elimination of maternal to child transmission of HIV
2. Eliminate lymphatic filariasis
3. Eliminate the threat of epidemic cholera
4. Reduce TB burden
5. Reduce burden of vaccine preventable diseases
6. Reduce maternal and neonatal mortality
7. Support the health system
7 Main Public Health Goals in Haiti

1. **Support elimination of maternal to child transmission of HIV**
   - Prevention of mother-to-child transmission of HIV is provided to 87% of women in need (one of the highest rates in the world).

2. **Eliminate lymphatic filariasis**
   - 71% of the metropolitan population underwent mass drug administration by February 2012.

3. **Eliminate the threat of epidemic cholera**
   - Improved sanitation, clean water and cholera prevention have reduced cholera rates by 97% in 2014 from the first half of 2011.

4. **Reduce TB burden**
   - The TB treatment success rate is now 84%.

5. **Reduce burden of vaccine preventable diseases**
   - More than 83% of eligible children were vaccinated against measles and rubella in 2013.

6. **Reduce maternal and neonatal mortality**

7. **Support the health system**
What makes it work?

- **Communication and coordination**
  - Very close relationship with Ministry of Health, communication with partners

- **Resources**
  - Funds
  - Administrative support, financial mechanisms, travel, logistics
  - Dedicated personnel with technical capacity
    - Experts in emergency response
    - Experts in surveillance/electronic systems
    - Experts with knowledge related to specific health threats

- **Linking emergency response and recovery**
10+ years of responding to public health emergencies

- Planning
- Emergency operations centers
- Adaptability
- Right amount of structure
- Role of science
- Risk communication is a core discipline
CDC works 24/7 to save lives & protect people from health threats

Rear Admiral Stephen C. Redd, MD
scr1@cdc.gov 404.639.7377 @DrReddCDC
Centers for Disease Control and Prevention
1600 Clifton Road NE, Atlanta, GA 30333
Phone: 1 800-CDC-INFO (232-4636)/TTY: 1 888-232-6348
Email: cdcinfo@cdc.gov Web: www.cdc.gov