

21st Century Quarantine: North Carolina's Experience with Measles and Ebola



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Objectives

1. Review basis for use of control measures as a public health response
2. Identify and describe two recent events in North Carolina in which quarantine was utilized

Control Measures in NC

- Communicable disease control measures established in law
 - NC Administrative Code
 - CDC guidelines incorporated by reference
- All persons required to comply



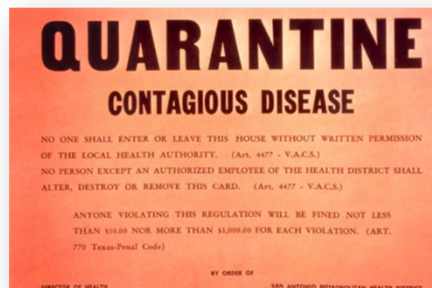
'Reasonable and effective'

- Public health officials must consider the gravity of the public health risk, the mode of transmission, the potential outcomes of possible containment methods, and the least restrictive means of containment.

Pope et al. Protecting Civil Liberties During Quarantine and Isolation in Public Health Emergencies. *Law Practice Today*; April, 2011.

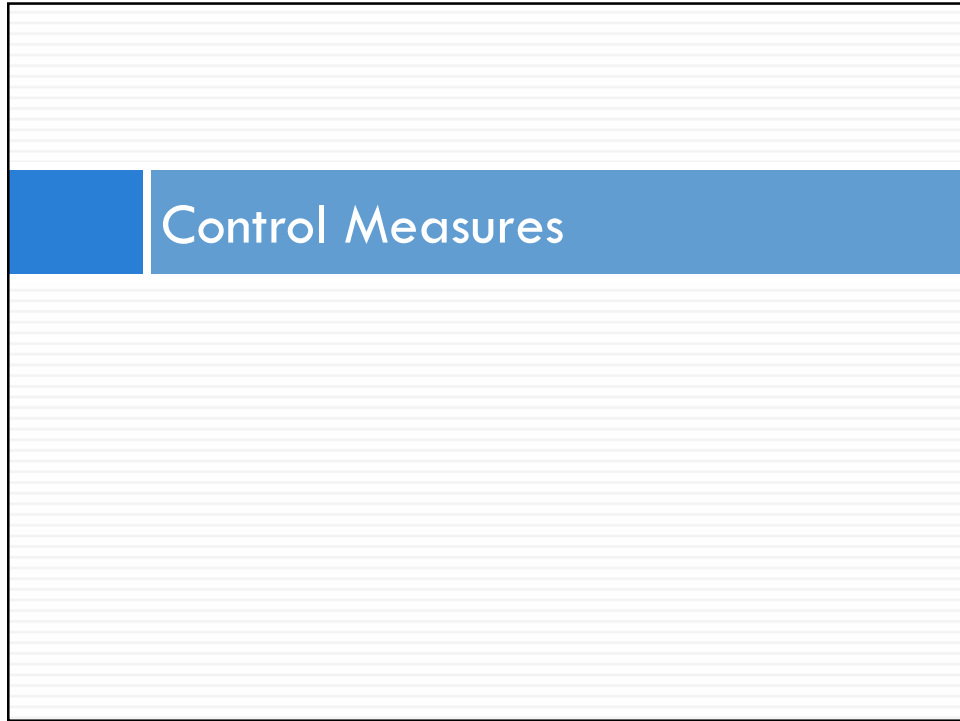
Considerations for Quarantine

- Public Health
- Ethical
- Political
- Economic
- Practical
- Other



Tips of the Trade

- Review the laws/rules
- Review the science/control measures
- Prepare partners in advance
- Scan the environment
- Develop a communications plan
- Consult with subject matter experts



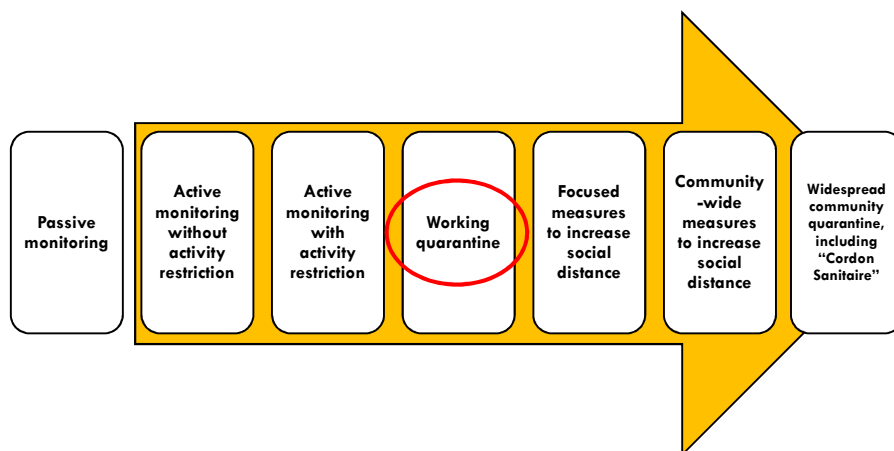
Control Measures

- Individuals
 - Isolation/Exclusion
 - Medical tests or treatments
 - Vaccination
 - Post-exposure prophylaxis
 - Quarantine

Control Measures

- Communities
 - ▣ Social distancing
 - ▣ Cancellation of public events
 - ▣ School or day care closure
- Environments
 - ▣ Quarantine
 - ▣ Food recall
 - ▣ Restaurant closure

Continuum of Control Measures



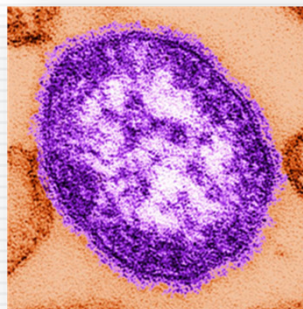
Is Quarantine Justified?

- Is the public's health endangered?
 - ▣ What is the gravity of that risk?
- Have all other reasonable means of controlling disease been exhausted?
- Do other less restrictive alternatives exist?

Will Quarantine be Effective?

- Disease Transmission
 - ▣ What is the mode of transmission?
 - ▣ Is it easily transmitted?
 - ▣ Is it transmitted in the early (presymptomatic) stage?
- Population: Is the population susceptible?
- Exposed Persons
 - ▣ Can they be rapidly identified?
 - ▣ Will they comply?

2013 Measles Outbreak



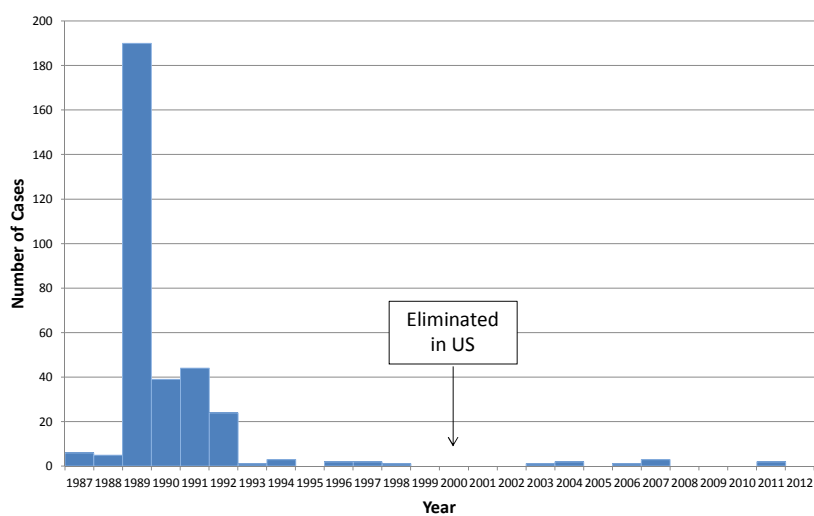
Measles

- Highly contagious viral illness
- Transmission by respiratory droplets or airborne
- Incubation period from exposure to:
 - Prodrome (respiratory symptoms): 10-12 days
 - Rash: ~14 days (range, 7 – 18 days)
- Infectious period: 4 days before to 4 days after rash onset
- Highly-effective vaccine available (MMR)

Measles



Measles Cases Reported in NC, 1987- 2012



The Village

- Rural Hare Krishna community
- 25 resident families
- No specific religious belief discouraging immunization



Images: <http://www.prabhupadavillage.com/>



Measles Quarantine Guidance

- APHA –
 - “Quarantine: Usually impractical”
- CDC –
 - “...the spread of the disease can be limited with... quarantine of susceptible contacts...”
 - “...quarantine has helped to contain the spread of the disease to the surrounding community.”
 - “Imposing quarantine measures for outbreak control is both difficult and disruptive to schools and other institutions.”

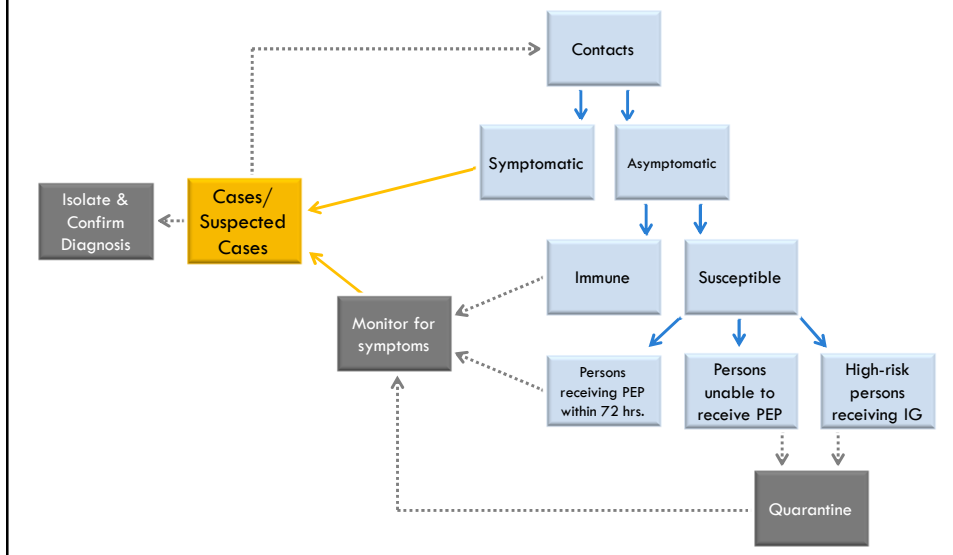
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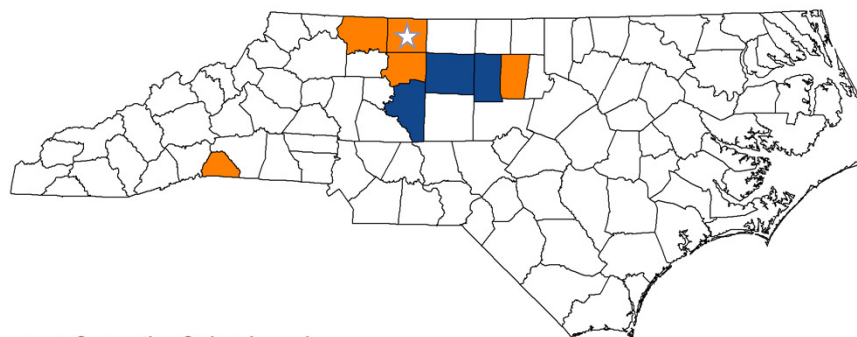
Will Quarantine be Effective?

- Disease Transmission
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 - Is it easily transmitted?
 - Is it transmitted in the early (presymptomatic) stage?
- Is the population susceptible?
- Exposed Persons
 - Can they be rapidly identified?
 - Will they comply?

Control Strategies

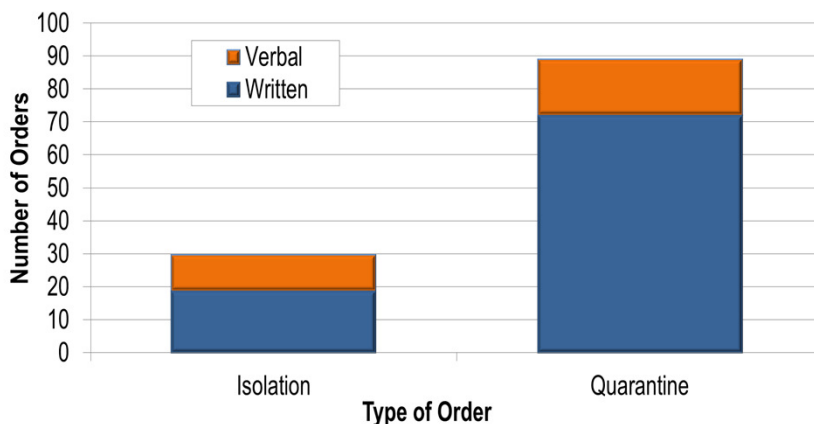


Distribution of measures



- Quarantine Orders Issued
- Isolation and Quarantine Orders Issued

Written Orders Preferred



Model Quarantine Order

MODEL MEASLES QUARANTINE ORDER (Suspected Exposure)

You may have been exposed to measles. Your exposure requires further public health investigation. Measles is a disease associated with fever, runny nose, watery red eyes and cough. After a few days, a rash appears on the head and spreads over the entire body. Measles is a highly contagious disease that may be passed from person to person mostly through the air by coughing and sneezing. It can also be transmitted through contact with secretions from the nose or mouth of an affected person. A person who is not vaccinated against measles or has not had measles earlier in his or her life and was exposed to measles may have measles as a result, and may transmit the infection to others even before having any symptom. Although rare, serious respiratory or neurologic complications may happen and possibly result in death. Pregnant women exposed to measles may also experience complications. If measles spreads in the community, it could have severe public health consequences.

I, _____ (name), Health Director of _____ County Health Department pursuant to authority vested in me by North Carolina General Statute (G.S.) 130A-145, issue this QUARANTINE ORDER to _____ (Person's name) DOB: _____.

You are required to remain at [insert home address] until [insert date].

You have been properly informed and counseled by _____, R.N., Communicable Disease Nurse with the _____ County Health Department regarding the control measures for measles. Failure to comply with the control measures is a violation of G.S. 130A-145.

Model Quarantine Order

You are required to:

- Remain in your home until _____.
- Avoid contact with any persons other than those in your household. Do not attend any gatherings or group meetings. You may not have any visitors to your home.
- Contact the health department immediately if you develop symptoms.
- Call a doctor or seek medical care if a rash develops.
- Before seeking medical care, call ahead and get instructions from the provider before arriving at the medical office, clinic or hospital.
- If a medical emergency arises and you need to call 911, inform the First Responders that you may have measles.

If you fail to comply with this QUARANTINE ORDER, you will be subject to prosecution for a misdemeanor offense pursuant NC law (G.S. 130A-25) and punishable by up to two (2) years imprisonment.

If you plan to move to a new address or leave the county, you are required to notify _____ County Health Department and obtain prior approval. You may contact the Health Department by calling: _____.

The staff of this Health Department remains available to provide assistance and counseling to you concerning your possible exposure to measles and compliance with this QUARANTINE ORDER.

You may petition the Superior Court for review of the restriction of your freedom of movement contained in this QUARANTINE ORDER pursuant to G.S. 130A-145(d).

Model Voluntary Quarantine Order

SAMPLE RECOMMENDATIONS FOR VOLUNTARY QUARANTINE (Measles)

You may have been exposed to measles. Your exposure requires further public health investigation. Measles is a disease associated with fever, runny nose, watery red eyes and cough. After a few days, a rash appears on the head and spreads over the entire body. Measles is a highly contagious disease that may be passed from person to person mostly through the air by coughing and sneezing. It can also be transmitted through contact with secretions from the nose or mouth of an affected person. A person who is not vaccinated against measles or has not had measles earlier in his or her life and was exposed to measles may have measles as a result, and may transmit the infection to others even before having any symptom. Although rare, serious respiratory or neurologic complications may happen and possibly result in death. Pregnant women exposed to measles may also experience complications. If measles spreads in the community, it could have severe public health consequences.

Unvaccinated persons who have been exposed to a person with measles are strongly advised to stay at home for 21 days after the last exposure and limit contact with others to avoid spreading the illness.

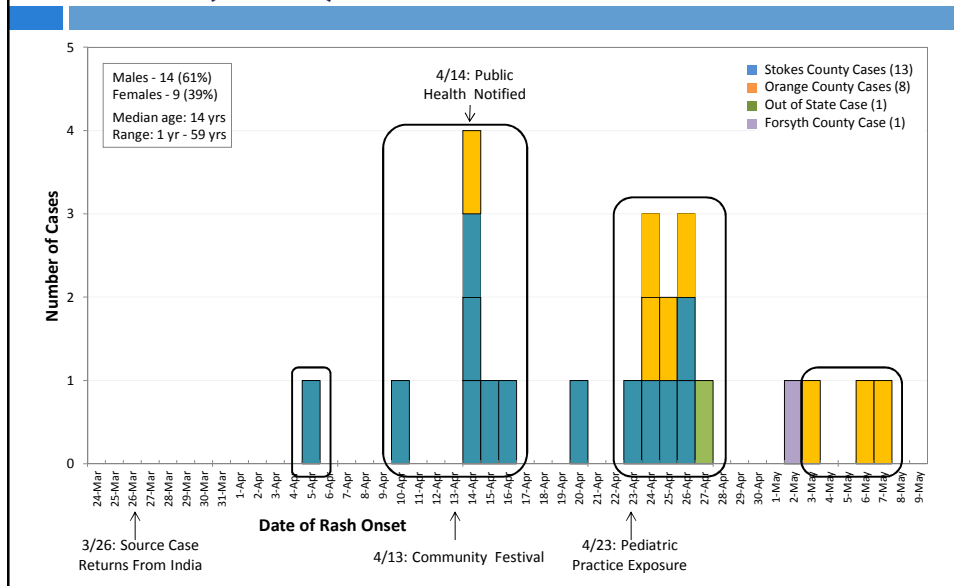
It usually takes about 10-21 days to develop symptoms of measles after exposure to the virus.

You have agreed to remain at [insert home address] until [insert date] and comply with the following control measures to help prevent the spread of measles in the community:

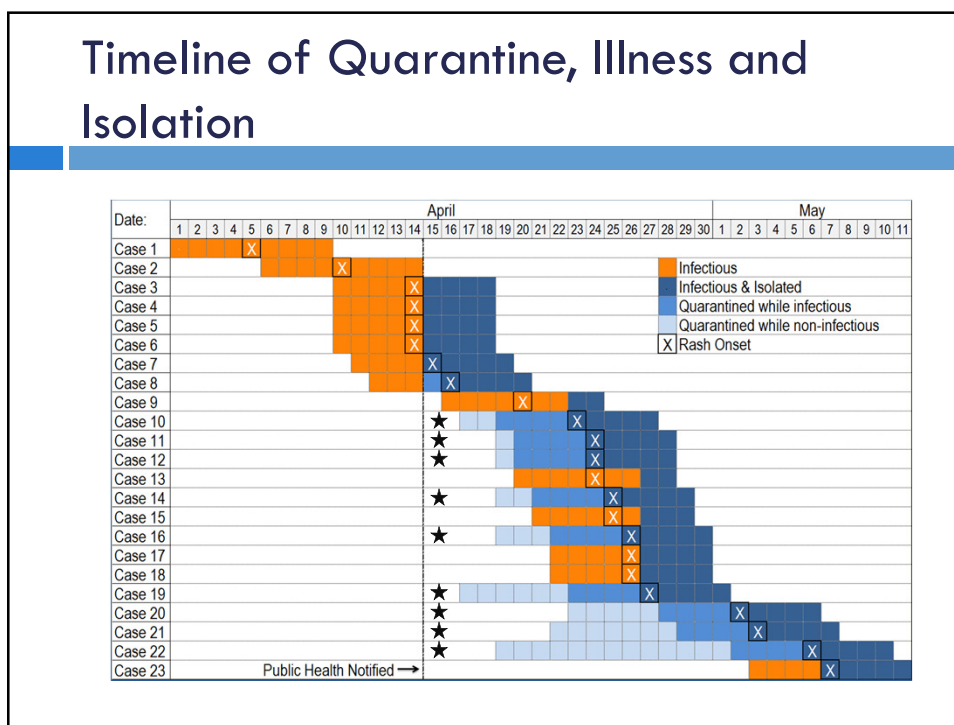
If you plan to move to a new address or leave the county, you are asked to notify _____ County Health Department and prior to moving. You may contact the Health Department by calling: _____.

The staff of this Health Department remains available to provide assistance and counseling to you concerning your possible exposure to measles and to these control measures.

Number of Measles Cases by Date of Rash Onset (n=23)



Timeline of Quarantine, Illness and Isolation



Ebola

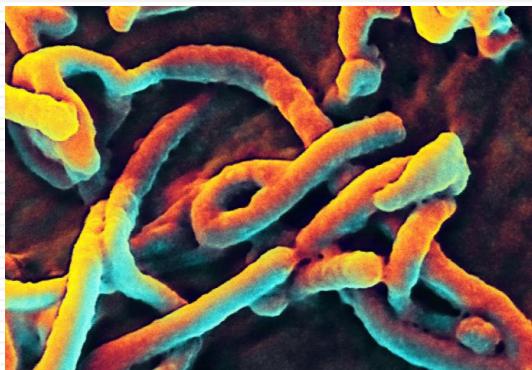


Photo: CDC PHIL

Note

Epidemiologic risk factors and monitoring and movement guidance of persons with potential Ebola exposure are presented to illustrate the evolution of the guidance and does not reflect current guidance.

- Current CDC information can be found at:
 - Interim U.S. Guidance for Monitoring and Movement of Persons with Potential Ebola Virus Exposure (<http://www.cdc.gov/vhf/ebola/exposure/monitoring-and-movement-of-persons-with-exposure.html>)
 - Epidemiologic Risk Factors to Consider when Evaluating a Person for Exposure to Ebola Virus (<http://www.cdc.gov/vhf/ebola/exposure/risk-factors-when-evaluating-person-for-exposure.html>)
- Current NC information can be found at:
<http://www.ncdhhs.gov/ebola/>

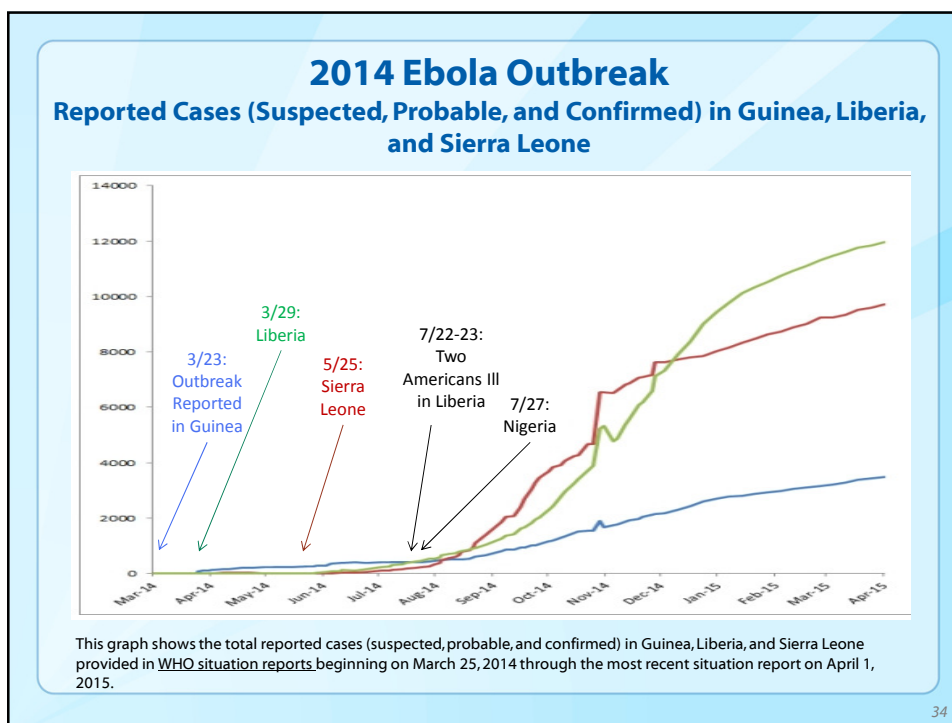
Ebola: Signs and Symptoms

- Initial: Fever, chills, myalgias, malaise, anorexia
- After 5 days: GI symptoms, such as nausea, vomiting, watery diarrhea, abdominal pain
- Hemorrhagic symptoms in 18% of cases
- Non-fatal cases typically improve 6–11 days after symptoms onset
- Fatality rates of 70% have been historically reported in rural Africa

Adapted from 'CDC Slides for Healthcare Workers'

Ebola

- Human-to-human transmission:
 - Direct contact with blood or body fluids
 - Sharps injury with contaminated needle or other sharp
 - Direct contact with the corpse of a person who died of EVD
 - Indirect contact with blood or body fluids via a contaminated object
- Incubation Period: 8-10 days (range: 2-21 days)
- Infectious Period: onset of symptoms through as long as virus detectable
- Treatment: Supportive only
- Vaccine: None



August 1, 2014

- Communicable Disease Branch notified of return of missionaries from Ebola-affected areas
 - ▣ Healthcare workers from ETC where US HCWs became ill
 - ▣ Family member of lab-confirmed case

Risk Factors

Defined in 8/8 CDC Case Definition:

- Contact with blood or body fluids of a suspected or known case; OR
- Residence in – or travel to – an area where transmission is active; OR
- Direct handling of bats, rodents or primates from endemic area.

Is Quarantine Justified?

- Is the public's health endangered?
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8/7: Interim NC Quarantine Strategy

- Applied to: Health Care workers (HCWs) and other persons determined to have had contact with a confirmed case of Ebola

NORTH CAROLINA			
RISK	PUBLIC HEALTH ACTION		
	MONITORING	RESTRICTED PUBLIC ACTIVITY	RESTRICTED TRAVEL
Contact with a confirmed case	Active monitoring twice daily by LHD	Yes (quarantined)	Yes (quarantined)

CDC Guidance for Monitoring and Movement of Persons with EVD Exposure (“M&M Guidance”)

- First version issued 8/8

CDC			
RISK LEVEL	PUBLIC HEALTH ACTION		
	MONITORING	RESTRICTED PUBLIC ACTIVITY	RESTRICTED TRAVEL
HIGH & LOW	<ul style="list-style-type: none"> • ...by public health authority • twice-daily self monitoring 	None	<ul style="list-style-type: none"> • No commercial conveyance • Local public travel in consultation with LHD • Timely access to care
NO KNOWN	Self-monitor	None	None

8/14: Interim Quarantine Strategy

- Applied to: Persons determined to have had contact with a suspected or confirmed case of Ebola

NORTH CAROLINA			
RISK LEVEL	PUBLIC HEALTH ACTION		
	MONITORING	RESTRICTED PUBLIC ACTIVITY	RESTRICTED TRAVEL
HIGH	Active monitoring twice daily by LHD	Yes (Quarantine)	Yes (Quarantine)
LOW	Active monitoring twice daily by LHD	None	None

8/14: Program Alert 8 (M&M Guidance)

- Applied to: Persons determined to have been in affected country in past 21 days

NORTH CAROLINA			
RISK LEVEL	PUBLIC HEALTH ACTION		
	MONITORING	RESTRICTED PUBLIC ACTIVITY	RESTRICTED TRAVEL
HIGH	Active monitoring twice daily by LHD	Yes (Quarantine)	Yes (Quarantine)
LOW	Active monitoring twice daily by LHD	None	None
NO KNOWN	Self-monitoring	None	None

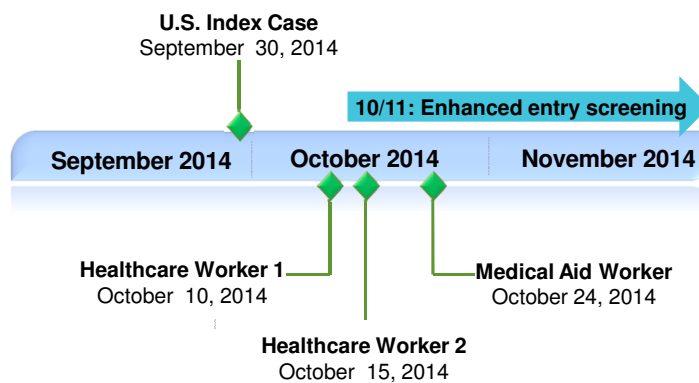
8/22: CDC M&M Guidance

- HCW caring for patients with PPE now 'no known exposure'
- "At this time, CDC is not recommending that asymptomatic contacts of EVD patients be quarantined, either in facilities or at home."

8/25: NC M&M Guidance

NORTH CAROLINA			
RISK LEVEL	PUBLIC HEALTH ACTION		
	MONITORING	RESTRICTED PUBLIC ACTIVITY	RESTRICTED TRAVEL
HIGH & LOW	Active monitoring twice daily by LHD	None	None
NO KNOWN	Self-monitoring	None	None

Ebola in the United States, 2014



Interim Guidance for Monitoring and Movement of Persons with EVD Exposure

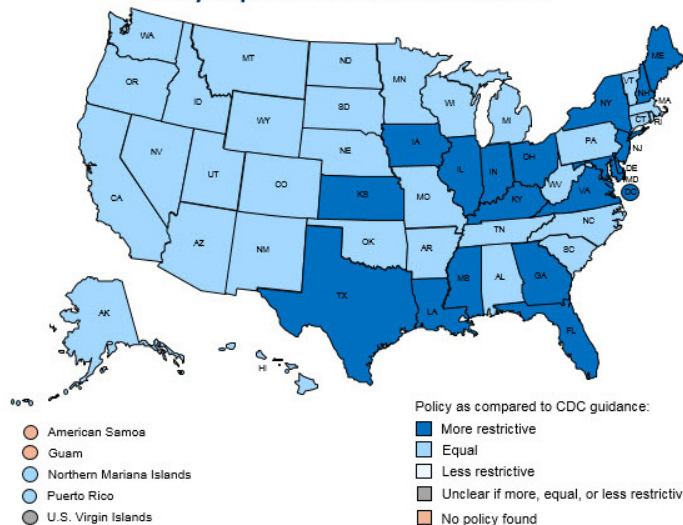
- CDC has created guidance for monitoring people exposed to Ebola virus but without symptoms

RISK LEVEL	PUBLIC HEALTH ACTION		
	Monitoring	Restricted Public Activities	Restricted Travel
HIGH risk	Direct Active Monitoring	Yes	Yes
SOME risk	Direct Active Monitoring	Case-by-case assessment	Case-by-case assessment
LOW risk	Active Monitoring for some; Direct Active Monitoring for others	No	No
NO risk	No	No	No

www.cdc.gov/vhf/ebola/hcp/monitoring-and-movement-of-persons-with-exposure.html

As of 10/27/14

Ebola Screening and Monitoring Policies for Asymptomatic Individuals



<http://www.cdc.gov/php/publications/topic/ebola.html>

[3/9/15]

Control Measures Template

CONTROL MEASURES FOR PERSONS WITH POSSIBLE EXPOSURE TO EBOLA

You have or might have been exposed to Ebola- e.g. travel to an affected country or exposure to a known case. Ebola is a severe disease characterized by fever, severe headache, muscle pain, weakness, diarrhea, vomiting, and joint pain. Symptoms may appear anywhere from 2 to 21 days after exposure to Ebola virus, although 10 on average. Ebola is transmitted by direct contact with the blood or secretions of an infected person or exposed to contaminated (such as needles) that have been contaminated with infected secretions. If Ebola spreads in the community, it would have severe public health consequences.

RISK CLASSIFICATION

Based on the information provided, at this time your risk of exposure to Ebola has been assessed as:

- High risk
 Some risk
 Low (but not zero) risk

Because you may have had exposure to Ebola, public health control measures are being implemented. These measures include contact with the _____ Health Department at least once daily to monitor for signs and symptoms of Ebola for 21 days after your last date in an affected country.

Control Measures Template

REQUIREMENTS

You must comply with these control measures through ____/____/____ (21 days following date of last possible exposure).

During this time, you are required to (The local health department will initial and check all that apply):

- Isolate yourself from others immediately if any symptoms develop and call the _____ County Health Department at (_____)

Monitoring

- Record your temperature and symptoms every 12 hours using the form provided.
- Be available for an in-person visit _____ time(s) per day by the county health department nurse.
- Report your temperature and symptoms _____ time(s) per day to the county health department nurse by phone.
- Keep a log of visitors to your home and public venues you visit (if permitted) using the form provided.

Movement

- Get approval from the local health department if you plan to move out of state or leave the county.
- Get approval from the local health department before using public transportation (e.g. aircrafts, buses, subways, etc.).
- Not take any forms of public transportation (e.g. aircrafts, buses, subways, etc.).
- Not go to public places (e.g. shopping centers, movie theaters) or congregate gatherings.
- Not go to your workplace (telework is permitted).
- Maintain a 3-foot distance from others while in non-congregate settings (e.g. jogging in a park).

Failure to comply with these control measures is a violation of G.S. 130A-144(f). If you fail to comply with these control measures, you may be subject to prosecution for a misdemeanor offense pursuant NC law (G.S. 130A-25) and punishable by up to two (2) years imprisonment.

Summary

- Before an event:
 - Know your community
 - Know the laws
 - Review the science
 - Establish partnerships
- During an event:
 - Assess your environment
- After an event:
 - Identify deficiencies



Acknowledgements

- Some slides provided by/ adapted from:
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 - CDC

Contact Information

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