

## Infection Prevention and Emergency Management

Terri Rebmann, PhD, RN, CIC  
Associate Professor

Institute for  
**BIC**security  
Saint Louis University School of Public Health

### Objectives

- Impact of infectious diseases during disasters
- Interventions for infection prevention during disasters
  - All healthcare settings
- How to assess organization's response plan r/t infection prevention

### 9/11: Food Safety at the Pentagon



### Hurricane Katrina



### Biggest Threat r/t Infectious Diseases



Emerging  
infectious disease

### Impact of 2003 SARS Outbreak

#### SARS Demographics 2003 Outbreak

Total cases: 8,096  
Mortality rate: 9.6%

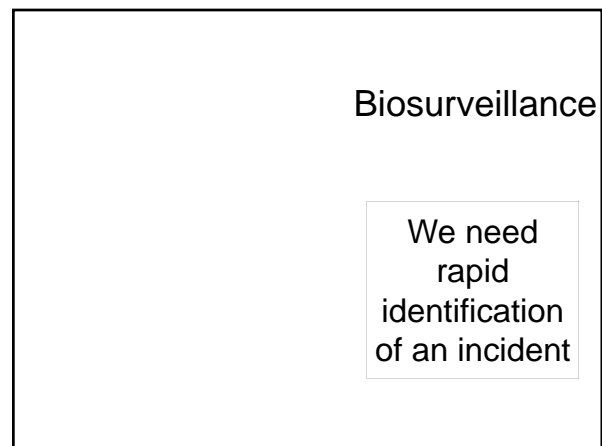
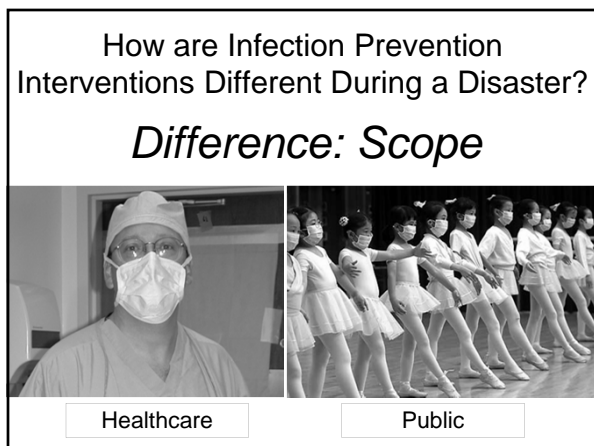
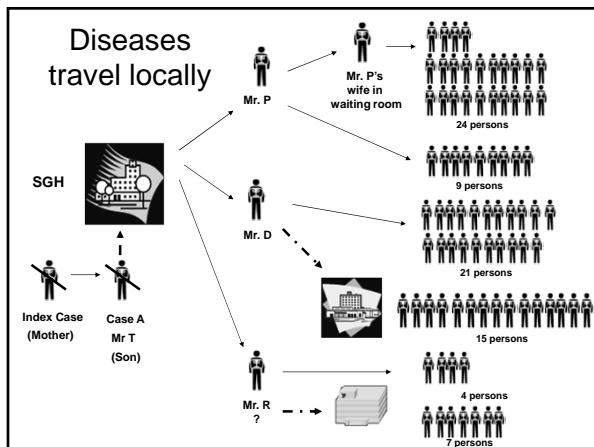
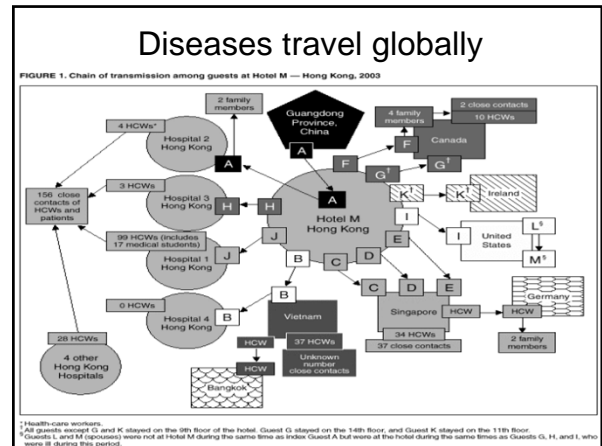
Nosocomial transmission 55 - 72%

72% of cases in Canada were HCWs

Costs: \$18 billion in Asia; \$1.5 - \$2.1 billion in Canada

*HCW infection associated with aerosolizing procedures & poor infection prevention practices, including PPE use/removal*



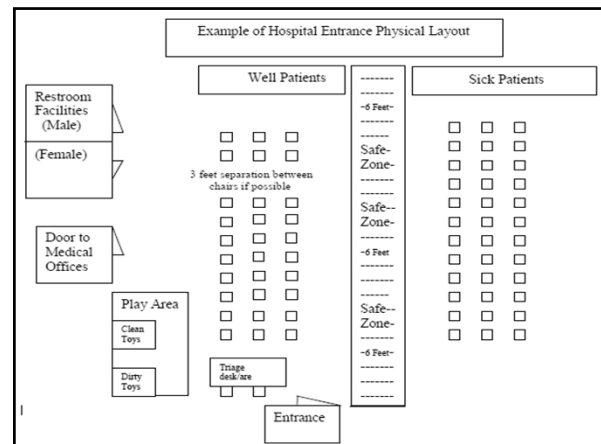


## Screening & Triage Best Practices

- Screen all visitors & staff
  - Consider limiting visitors
- Limit number of entrances
- Separate staff entrance



Train screeners well



## Isolation

- Follow HICPAC guidelines when possible
- Undiagnosed: transmission based precautions

### Symptoms Isolation Precautions Needed

Cough, runny nose, watery eyes = Standard

Fever & cough (adults) = Droplet

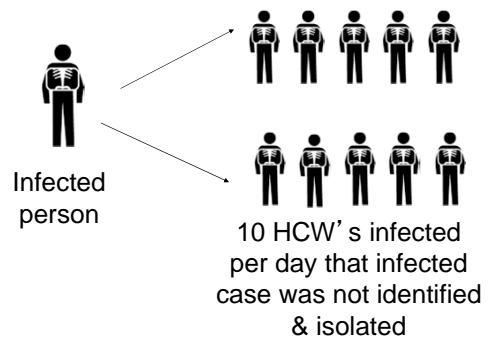
Fever & cough (kids) = Droplet & Contact

Fever, cough, bloody sputum, & wt loss = Airborne

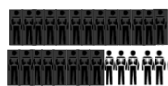
Eye infection or drainage = Standard

See table in APIC document

## Better to over-isolate SARS Outbreak in Canada



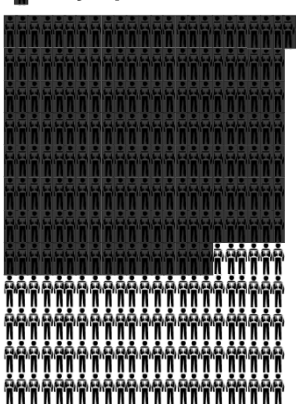
## H1N1 in NYC\*



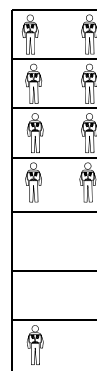
26 H1N1 pts  
associated  
with 277  
unprotected  
staff  
exposures

\*Banach, et al., 2011

■ = Symptomatic for ILI



## Improvised Isolation Area

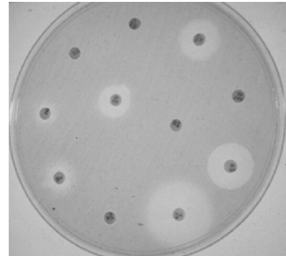


- Improvising isolation area
  - Physically separate the pt
  - Building or area outside can be used
  - Best if room/area has walls & a door
  - Makeshift walls/doors
    - Plastic or other barrier material
  - Hang isolation sign near entrance



## Discontinuing Isolation

- Do not D/C isolation until anti-infective therapy sensitivity is verified



Exposure to patient with anthrax : alcohol-based gels/foams are OK

Exposure to Anthrax spores:  
Need soap & water

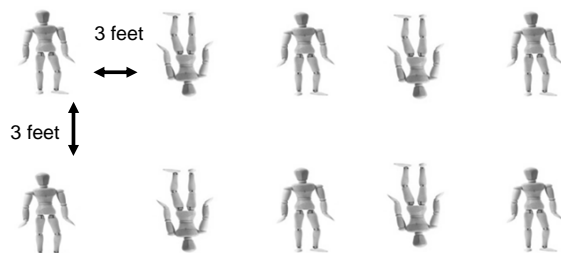


## Cohort Staff

- Assign dedicated staff
- Use vaccinated staff



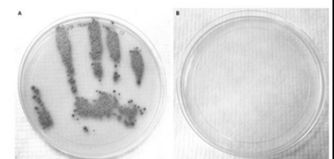
## Social Distancing Principles



Bed/stretcher/cot configuration in surge areas

## Hand Hygiene

NEJM:  
Med student tied to MRSA outbreak  
- Failure to wash hands



## Need PPE

- Adequate amounts
- Teach healthcare personnel how to use it

## PPE Estimates for Planning & Stockpiling

Category of Staff	Respirator	Gown (disposable)	Gloves (disposable)	Goggles
Little to no exposure	1 disposable per contact/exposure	1 per exposure	1 per contact	None
Prolonged exposure	1 <b>reusable</b> per outbreak (plus 2 cartridges/month*)	1 per exposure	1 per contact	1 per outbreak
Infrequent exposure(s)	1 <b>reusable</b> per outbreak (plus 2 cartridges/month*)	1 per shift	1 per contact	1 per outbreak

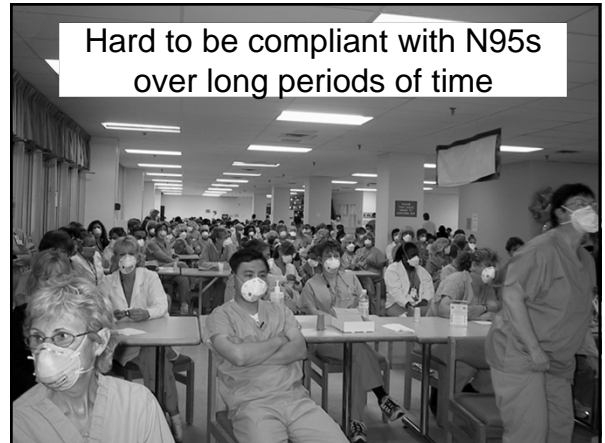
\*Disposable respiratory cartridges are needed for reusable respirators.

Radonovich et al. (2009)

## Remove Mask/Respirator



## Hard to be compliant with N95s over long periods of time



## Extending the Use/Reusing Respirators

- APIC Guidance
  - APIC website
  - Free



APIC Position Paper: Extending the Use and/or Reusing Respiratory Protection in Healthcare Settings During Disasters

Co-Author by APIC Emergency Preparedness Committee, Public Policy Committee and Regulatory Review Panel

### Lead Author:

Teri Robinson, PhD, RN, CIC

### Secondary Authors:

Sharon Alexander, MPH, BSN, MT(ASCP), CIC  
 Judith Bailey, MS, MPH, CIC  
 Thomas Chan, RN, IC  
 Barbara Chandra, RN, BSN, MEd, CHSE  
 Michael Clougherty, MS, BSN, REHS, CIC  
 Bill Cull, M. Ed, AG, LP  
 Tracy Cox, RN, CIC  
 Susan A. Deles, RN, MS, CIC  
 Patsy Gony, RN, CIC  
 Linda R. Greene, RN, MPS, CIC  
 Sue Hiley, RN  
 Rand M. Klotz, MA, MPH, MT(ASCP), CIC, ABQ, CHP, CHQ, CSQA  
 Sharon P. Krysniak, MS, MT(ASCP), CIC  
 Sue LaPointe, RN, MEd, CIC  
 Deanne Moore, RN, MS, CIC, CCRN  
 Frank E. Myers, III, MA, CIC  
 Michael Olsson, BS, MPH, CIC  
 Patricia Rosenbaum, RN, CIC  
 Barbara Russell, RN, MPH, CIC  
 Jane Russell, MPH, CIC, CHP  
 Douglas Smith, MS, CIC  
 Rachel L. Stroud, MT, MPH, CIC  
 William Wagner, PhD, CHM, CHP, CHFP

## Linen Management

- Laundry staff need PPE
- Consider using disposable linens
- Bag at point of use

Smallpox is a major risk for laundry personnel



***Pull:***  
**PODs**



**No adverse events in 15 years  
> 50,000 shots & 2,000 intranasal  
vaccines administered)**  
*Carrico et al. (2012)*

### Drive through vaccine program



- Published in  
AJIC

HCW role in  
disease spread

True or False:  
25% of unvaccinated  
HCWs claim they  
don't have a role in  
disease tx

### 137 Secondary Cases

- Free of charge on APIC Website

[www.apic.org](http://www.apic.org)

## Infection Prevention and Control for Shelters During Disasters\*

Prepared by:  
2007/2008 APIC Emergency Preparedness Committee

Lead Author:  
Terri Rebmann, PhD, RN, CIC

**Secondary Authors**  
Rita Wilson, BS, CLS, MT(ASCP), CIC; Sharon Alexander, MPH, BSN, MT(ASCP), CIC; Michael Chongchuen, BSEH, CIC; Diane Moser, RN, MS, CIC, CCRN; Barbara Cravillo, RN, BSN, MS, CHCE; Barbara Russell, RN, MPH, CIC; Bill Coll, M.Pub. Ad. LP; Sue LaPointe, RN, MSEd, CIC; Bill Wagner, ScD, CHCM, CHSP; Michael O'Brien, BS, MPH, CIC; Veronica Underman, MD, MPH

\*This document is not intended for printing; please visit the dedicated page on the website (<http://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>) for the latest information. The information is subject to change without notice. The information is for informational purposes only and is not intended to be used for the diagnosis, treatment, or prevention of any disease. The information is for informational purposes only and is not intended to be used for the diagnosis, treatment, or prevention of any disease.

[illegible]

## Table 1 Infection Prevention Components of a Hospital Emergency Management Plan

**Hospital Emergency Management Plan and Biological Annex**

- Addresses all biological events, including bioterrorism, emerging infectious diseases, and pandemic influenza<sup>1</sup> <sup>738R317-31739-31</sup>
- Identifies contact names and numbers for local and state health dept, state health association, and tribal health association<sup>2</sup> <sup>738R317-31739-32</sup>
- Is coordinated with local, state, and federal emergency management plans<sup>3</sup> <sup>738R317-31739-33</sup>
- Defines the command structure to implement the biological event response plan and the organizational structure that will be used, including the delegation of authority to carry out the plan 247R34-1
- Describes the responsibilities of key personnel and departments (and back-up for key personnel) within the facility related to executing the biological event component of the Plan<sup>4</sup> <sup>738R317-31739-34</sup>
- Defines how biological events are different from other types of MCEs<sup>5</sup> <sup>738R317-31739-35</sup>
- Has planning committee focusing on biological events that includes an infection preventionist and/or hospital epidemiologist<sup>6</sup> <sup>738R317-31739-36</sup>
- Stratifies implementation of specific actions on the basis of the WHO Pandemic Phases, US Government Pandemic Stages, and the pandemic severity index level worldwide, in the US, and at the local level<sup>7</sup> <sup>738R317-31739-37</sup>
- Includes the implementation of specific actions to be taken in the event of whether the attack is overt or covert, and the onset of high-risk syndromes or suspected routes of disease transmission<sup>8</sup> <sup>738R317-31739-38</sup>
- Describes the epidemiological cycle of a potential bioterrorism attack<sup>9</sup> <sup>738R317-31739-39</sup>
- Has a plan for how the plan will be updated and how it will be communicated contact names/information, incorporating lessons learned from exercises/similes, and changes in recommendations related to managing biological events<sup>10</sup> <sup>738R317-31739-40</sup>

**Assessing Hospital Readiness for MCE**

- States how and when a facility assessment will be performed that addresses infection prevention issues, such as location and amounts of hand hygiene products, isolation rooming, etc.<sup>11</sup> <sup>738R317-31739-41</sup>
- Incorporates biological preparedness, such as vaccination, influenza and bioterrorism, into a disaster exercise, whenever possible, this exercise should be community-wide<sup>12</sup> <sup>738R317-31739-42</sup>

**Infection Prevention Policies and Procedures**

- Has a protocol for providing 24/7 infection prevention and control coverage, including coverage for outpatient facilities or alternate care sites owned/prepared by the hospital<sup>13</sup> <sup>738R317-31739-43</sup>
- Has a protocol for how the hospital's Infection Control Committee, Infection Control Committee or care designs to rapidly implement

# Assessing Home Health Plans (in AJIC)

**Infection Prevention Components of a Home Health Emergency Management Plan**

Home Health Agency Emergency Management Plan
<ul style="list-style-type: none"> <li>Addresses all biological events, including bioterrorism, emerging infectious diseases, and pandemic influenza</li> <li>Identifies contact names and numbers for local and state health dept, state health association, and tribal health association</li> <li>Is coordinated with local, state, and federal emergency management plans</li> <li>Identifies the person(s) authorized to implement/activate the plan and the organizational structure that will be used, including the delegation of authority to carry out the plan 347</li> <li>Describes the responsibilities of key personnel and departments (and back-ups for key personnel) within the agency related to executing the Plan</li> <li>Defines how biological events are different from other types of MCEs</li> <li>Has planning committee focusing on biological events</li> <li>Stratifies implementation of specific actions on the basis of the WHO Pandemic Phases, US Government Pandemic Stages, and the pandemic severity index level worldwide, in the US, and at the local level</li> <li>Stratifies implementation of specific actions for a bioterrorism attack on the basis of whether the attack is overt or covert, and on the basis of high-risk syndromes or suspected routes of disease transmission</li> <li>Describes the epidemiological signs of a potential bioterrorism event</li> <li>States how often the Plan will be updated and by whom, including contact names/information, incorporating lessons learned from exercises/drills, and changes in recommendations related to managing biological events</li> </ul>
<p><b>Assessing Agency Readiness for MCE</b></p> <ul style="list-style-type: none"> <li>States how and when an agency assessment will be performed that addresses infection prevention issues, such as location and amount of hand hygiene products and PPE, how to implement home isolation, etc.</li> <li>Incorporates biological scenarios, such as pandemic influenza or bioterrorism, into a disaster exercise; wherever possible, this exercise should be community-wide</li> </ul> <p><b>Infection Prevention Policies and Procedures</b></p> <ul style="list-style-type: none"> <li>Identifies an infection preventionist and/or hospital epidemiologist who will serve as the point-of-contact for questions or consultation related to infection prevention during an MCE</li> <li>Has a protocol for personal protective equipment (PPE) use and hand hygiene</li> <li>Includes policies for modifying admission criteria on the basis of current agency capacity and disease status, including procedures for closing the agency to admissions of potentially infectious patients or non-infectious patients</li> </ul>

# Practice Makes.... Better



**Public Health  
POD drill**

**Bioterrorism  
scenario tests  
coordination  
with law  
enforcement**

# Infectious Disease Scenarios



Smallpox  
moulage



Measles  
moulage



## 7

## **References**

- Radonovich, L. J., Magalian, P. D., Hollingsworth, M. K., and Baracco, G. (2009). Stockpiling supplies for the next influenza pandemic. *Emerging Infectious Diseases*, 15(6). Retrieved August 17, 2010 from: <http://www.cdc.gov/EID/content/15/6/e1.htm>
- Rebmann, T. (2005). Management of patients infected with airborne-spread diseases: An algorithm for infection control professionals. *American Journal of Infection Control*, 33(10), 571-579.
- Rebmann, T. (2009). Assessing hospital emergency management plans: A guide for infection preventionists. *American Journal of Infection Control*, 37(9), 708 – 714.e4.
- Rebmann, T., and Coll, W. E. (2009). Infection Prevention in Points of Dispensing (POD). *American Journal of Infection Control*, 37(9), 695-702.
- Rebmann, T., Citarella, B. B., Subramaniam, D. P., and Subramaniam, D. S. (2011). Assessing the infection prevention components of home health emergency management plans. *American Journal of Infection Control*, 39(10):849-857.
- Volkman, J. C., Rebmann, T., Hilley, S., Alexander, S., Russell, B., and Wagner, W. (2012). Infection prevention disaster preparedness planning for long-term care facilities. *American Journal of Infection Control*, 40, 206-210.
- Rebmann, T., Alexander, S., Cain, T., Citarella, B., Cloughessy, M., Coll, B., et al. (2009). APIC Position Paper: Extending the Use and/or Reusing Respiratory Protection in Healthcare Settings During Disasters. Retrieved November 20, 2009 from: <http://www.apic.org>
- Rebmann, T., Russell, J., Russel, B., Hilley, S., Coll, B., Alexander, S., et al. (2013). Infection Prevention for Ambulatory Care Centers During Disasters. Retrieved from: <http://www.apic.org>
- Rebmann, T., Russell, J., Alexander, S., Cloughessy, M., Coll, B., Hilley, S., et al. (2009). Infection Prevention for Alternate Care Sites. Retrieved from: <http://www.apic.org>