What Every Safety Professional Needs to Know About Global Health Security

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What Every Safety Professional Needs to Know About Global Health Security

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What Every Safety Professional Needs to Know About Global Health Security

- Levels of protective gear

- North American Level 2 Suit

- North American Level 3 Suit

- North American Level 4 Suit

- Staff member in Level 4 suit
Learning Objectives

• Define terms related to infectious diseases
• List the 5 strategic objectives established for enhancing “Global Health Security”
• Describe examples of current threats to our Global Health Security
• Review the professions that are focused primarily on the control and prevention of infectious disease
• Discuss the steps that should be taken by safety professionals to not only protect themselves and their families, but also the organizations they serve
• Provide a useful list of references
Health

• WHO Definition:
  – “Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”

  • Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States
Disease

• “An interruption, cessation, or disorder of bodily function, system or organ”
  • Steadman’s Medical Dictionary, 27th Edition

• Classified by the World Health Organization (WHO) as either “non-communicable” or “communicable”
  – Non-communicable: a disease manifested in an individual that is not transmissible to others
  – Communicable: a disease that is transmissible by infection or contagion directly or through the agency of a vector; also commonly referred to as “infectious”
Outbreak

• The occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season.
• A single case of a communicable disease long absent from a population, or caused by an agent not previously recognized in that community or area, or the emergence of a previously unknown disease, may also constitute an outbreak and should be reported and investigated.

World Health Organization
Communicable Disease History

- Infectious disease outbreaks have been documented throughout history
- Examples include epidemics of smallpox, leprosy, tuberculosis, meningococcal infections, and diphtheria
- From the earliest times, humans have sought to understand the natural forces and risk factors associated with the patterns of illness and death in society
- The magnitude of mortality was enormous. Medicine and religion strove to console the sick and dying. But because medical knowledge was lacking, religious explanations for disease dominated.
Epidemiological Progress

- While the exact biological basis for many diseases had not yet been determined, the science of epidemiology emerged as a valuable tool in combating disease
  - John Snow (1813-1858) evaluated the transmission of cholera 30 years prior to the identification of the causative organism
  - William Budd (1868-1953) chronicled the transmission of typhoid fever 35 years prior to the isolation of Salmonella typhi.
  - Ignatz Semmelweiss documented an outbreak of puerperal (or childhood fever) in 1847 in a hospital due to the absence of good hand hygiene
Microorganism Discovery

• 1683 Anton van Leeuwenhock greatly improved the microscope and reported the presence of materials in rainwater and human excretions
• 1857 Louis Pasteur demonstrated that fermentation depended on the presence of microorganisms
• Robert Koch demonstrated in, 1876, that one could reproducibly transmit anthrax from diseased cows to mice and developed “Koch’s Postulates”
Koch’s Postulates:

1. The microorganism must be found in abundance in all organisms suffering from the disease, but should not be found in healthy organisms.

2. The microorganism must be isolated from a diseased organism and grown in pure culture.

3. The cultured microorganism should cause disease when introduced into a healthy organism.

4. The microorganism must be reisolated from the inoculated, diseased experimental host and identified as being identical to the original specific causative agent.
Further Progress

• The identification of causative microorganisms lead to better epidemiological understanding of diseases
• Microbiology, virology, and immunology emerged as professions in parallel to epidemiology, statistics and public health
• Between 1887 and 1902 the NIH was created for “the study of infectious and contagious disease and matters pertaining to public health”
• Better understanding of disease pathology also lead to better treatments. Vaccines for rabies, anthrax, diphtheria and tetanus were developed are considered one of the most important public health improvements of the century.
The Significance of Public Health in America:
64% Increase in Average Life Expectancy Over 100 Year Period

http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm
Ten Great Public Health Achievements in the United States, 1900 to 1999

1. Vaccinations
2. Motor-vehicle safety
3. Safer workplaces
4. Control of infectious disease
5. Decline in deaths from coronary heart diseases and stroke
6. Safer and healthier foods
7. Healthier mothers and babies
8. Family planning
9. Fluoridation of drinking water
10. Recognition of tobacco use as a health hazard

150 Years of Change

Number of Days to Go Around the World

World Population in Billions
Line from the United States Public Health Service Commission Corps march song

“...In the silent war against disease, no truce is ever seen...”
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Continued Disease Burden and Associated Professions

• Despite all of this progress, the infectious disease burden in the United States is significant, resulting in over 100,000 deaths each year.
  – (Note – this is 22X the number of workplace fatalities each year: 4,400)
• While the health care community is focused on the treatment of individuals with disease (a subset of which may be infectious), there are four professions that are focused primarily on the control and prevention of infectious disease:
  – (1) infection preventionists
  – (2) biosafety professionals
  – (3) environmental health specialists
  – (4) public health professionals
• Although the targeted populations for each of these professions differ, a common set of core competencies exists that are absolutely essential in order to successfully control and prevent infection.
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Registered Environmental Health Specialist (Registered Sanitarian)
- Focus: Protection of the public
- Core areas: (1) Food, (2) Water, (3) Housing dangers, and (4) Waste management
- Professional organization: National Environmental Health Association (NEHA)
- Certification: REHS or RS

Infection Preventionist
- Focus: Protection of patients in clinical settings
- Professional organization: Association for Professionals in Infection Control and Epidemiology (APIC)
- Certification: CIC

Common core competencies
- Disease Control:
  - Basic mechanisms of infection
  - Germ theory
  - Koch’s postulates
  - Immunology
  - Disease reservoirs & hosts
  - Modes of transmission
  - Pathogens
  - Taxonomy
  - Genetics DNA/RNA

Biosafety
- Focus: Protection of workers in labs
- Professional organization: American Biological Safety Association (ABSA)
- Certification: CBSP

Public Health (MPH)
- Focus: Protection of the public
- Core courses: (1) Epidemiology, (2) Biostatistics, (3) Occupational and Environmental Health, (4) Behavioral Sciences and (5) Management & Policy Sciences
- Professional Organization: American Public Health Association (APHA)
- Certification: CPH
Infection Preventionists

- Primarily focused on protection of patients in clinical setting
- Examples diseases and organisms:
  - Clostridium difficile
  - Hepatitis
  - Human Immunodeficiency Virus (HIV)
  - Methicillin-resistant Staphylococcus aureus
  - Tuberculosis (TB)
  - Vancomycin-resistant Enterococci (VRE)
- Areas of concern:
  - Healthcare Associated Infections (HAIs) –
    - Central line-associated bloodstream infection (CLABSI)
    - Catheter-associated Urinary Tract Infection (CAUTI)
    - Surgical Site Infection (SSI)
    - Ventilator-associated Pneumonia (VAP)
- Key terms / concepts: patient safety, medication safety, injection / sharps safety, blood / transplant safety, vaccine safety, hand hygiene
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Registered Environmental Health Specialist

• Primarily focused on protection of public from infection from food, water, housing, waste
• Example areas of concern:
  – Foodborne illness –
    • Norovirus
    • Clostridium perfringens
    • Campylobacter spp.
    • Staphylococcus aureus
    • E. coli
    • Listeria monocytogenes
  – Water borne illness –
    • Giardia lamblia
    • Cryptosporidium parvum
• Key terms/concepts: Swimming pools and recreational facilities, Vectors, pests, and poisonous plants, Solid and hazardous waste, air quality and noise, Occupational health and safety, General environmental health, Disaster sanitation and emergency planning
Biosafety Professional

• Primarily focused on protection of lab workers
• Areas of concern:
  – Risk grouping of infectious agents (RG 1-4)
    • e.g. bacteria, viruses, parasites, prions
  – Biosafety level designations (BSL 1-4)
  – Animal biosafety level designations (ABSL 1-4)
  – Plant biosafety
  – Recombinant and synthetic nucleic acid molecules (NIH Guidelines)
  – Select agents and toxins (CDC/USDA)
  – Dual use research of concern
  – Biosecurity
  – Training
  – Biosafety cabinetry (and other containment)
  – Transportation of infectious agents
  – Decontamination, disinfection, sterilization
• Key terms/concepts: risk assessment, containment, laboratory acquired infections, good microbiological technique, safe work practices, laboratory facility design, gain of function
Public Health Professional

• Primarily focused on the education and protection of public from non-contagious and contagious diseases

• Example areas of concern:
  - Influenza
  - Tuberculosis
  - Sexually transmitted infections
  - Ebola

• Key terms/concepts: immunizations, records, contact investigations, “fever watch,” “enforceable control orders”
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Key Resource Across All Professions

• “Preventing the transmission of infectious diseases has never been more challenging than today in a world that is characterized by tremendous globalization, connectivity, and speed. I can think of no other resources more vital than the APHA’s Control of Communicable Diseases Manual for health professionals to meet these challenges head-on”

» Dr. Julie Gerberding, former Director, CDC
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APHA Control of Communicable Diseases Manual

• Identification
• Infectious agent
• Occurrence
• Reservoir
• Modes of transmission
• Incubation period
• Period of communicability
• Susceptibility
• Methods of control
### CDC Current Outbreak List

Infectious disease outbreaks currently being reported on by CDC. Listings include those outbreaks for which content is currently published on the CDC website.

#### U.S.-Based Outbreaks

Recent investigations reported on CDC.gov

- **Alfalfa Sprouts - Salmonella Reading and Salmonella Abony**
  - Announced August 2016
- **Live Poultry - Salmonella Enteritidis and 7 more**
  - Announced June 2016
- **Flour - E. coli O121 & O26**
  - Announced June 2016
- **Raw Milk – Listeria monocytogenes**
  - Announced March 2016
- **Elizabethkingia anophilias in the Midwest**
  - Announced January 2016
- **Small turtles – Salmonella San Diego and Salmonella Poona**
  - Announced October 2015

#### Outbreaks Affecting International Travelers

Please see the [Traveler's Health site](https://www.cdc.gov/travel/) for a complete list.

- **Alert - Yellow Fever in Angola**
  - Announced August 2016
- **Watch - Yellow Fever in Democratic Republic of the Congo**
  - Announced August 2016
- **Watch - Yellow Fever in Uganda**
  - Announced August 2016

#### Understanding Outbreaks

In the last two years, CDC has sent scientists and doctors out more than 750 times to respond to health threats. Learn more below.

- Investigating Outbreaks
- CDC's Role in Global Health Security

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Texas DSHS Infectious Disease Outbreak Webpage

Texas Zika Cases by County:

<table>
<thead>
<tr>
<th>County</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bee</td>
<td>4</td>
</tr>
<tr>
<td>Bexar</td>
<td>6</td>
</tr>
<tr>
<td>Brazos</td>
<td>1</td>
</tr>
<tr>
<td>Calhoun</td>
<td>3</td>
</tr>
<tr>
<td>Dallas</td>
<td>30</td>
</tr>
<tr>
<td>Denton</td>
<td>4</td>
</tr>
<tr>
<td>El Paso</td>
<td>1</td>
</tr>
<tr>
<td>Ellis</td>
<td>1</td>
</tr>
<tr>
<td>Fort Bend</td>
<td>6</td>
</tr>
<tr>
<td>Frio</td>
<td>3</td>
</tr>
<tr>
<td>Gray</td>
<td>1</td>
</tr>
<tr>
<td>Galveston</td>
<td>2</td>
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<tr>
<td>Grayson</td>
<td>1</td>
</tr>
<tr>
<td>Gregg</td>
<td>1</td>
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<td>Hamilton</td>
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<td>Harris</td>
<td>33</td>
</tr>
<tr>
<td>Jefferson</td>
<td>1</td>
</tr>
<tr>
<td>Lubbock</td>
<td>1</td>
</tr>
<tr>
<td>Matagorda</td>
<td>1</td>
</tr>
<tr>
<td>Hudspott</td>
<td>1</td>
</tr>
<tr>
<td>Palo Pinto</td>
<td>1</td>
</tr>
<tr>
<td>Randall</td>
<td>1</td>
</tr>
</tbody>
</table>
Texas DSHS Infectious Disease Outbreak Webpage

West Nile in Texas - August 23, 2016

West Nile illness is again spreading in Texas. People should reduce their risk of exposure to the mosquito-borne virus that causes it by eliminating standing water and other mosquito breeding areas and avoiding mosquito bites.

As many as 80 percent of people who contract the virus will have no symptoms at all. Almost all others will have West Nile fever with symptoms like headache, fever, muscle and joint aches, nausea and fatigue. A very small minority will develop West Nile neuroinvasive disease, a life-threatening illness that can cause neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness and paralysis.

In 2015, there were 375 human cases of West Nile illness in Texas, including 16 deaths.

Human West Nile Cases By County for 2016

<table>
<thead>
<tr>
<th>County</th>
<th>West Nile Fever</th>
<th>West Nile Neuroinvasive Disease</th>
<th>Total Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angelina</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bell</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Brazos</td>
<td>1</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Collin</td>
<td>4</td>
<td>3</td>
<td>7</td>
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<tr>
<td>Dallas</td>
<td>9</td>
<td>14</td>
<td>23</td>
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<tr>
<td>Denton</td>
<td>4</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Dimmit</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Eastland</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>El Paso</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Ellis</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Harris</td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Hunt</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Johnson</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>McLennan</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nueces</td>
<td>0</td>
<td>4</td>
<td>4</td>
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<tr>
<td>Palo Alto</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rockwall</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Rundell</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tarrant</td>
<td>2</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Totals</td>
<td>22</td>
<td>47</td>
<td>69</td>
</tr>
</tbody>
</table>
Blue Bell Recalls All Products - April 21, 2015

Blue Bell Creameries has recalled all products due to concerns about illness. Texas urges consumers to follow the recall and not eat any Blue Bell products.

Two post cases of listeriosis (Kansas, 5; Texas, 3; Arkansas, 1; Oklahoma, 5) recently have been associated with Blue Bell products. The Texas cases identified as part of the outbreak are related to products made at the company’s Oklahoma plant. The Texas cases were part of the illnesses identified beginning in March 2015 and are linked to recalled products from February 2015.

Ten post cases of listeriosis (Kansas, 5; Texas, 3; Arkansas, 1; Oklahoma, 5) have been associated with Blue Bell products. The Texas cases identified as part of the outbreak are related to products made at the company’s Oklahoma plant. The Texas cases were identified and linked to products from the company’s Brenham plant.

Listeriosis is an infection caused by eating food contaminated with the bacterium Listeria monocytogenes. The disease primarily affects older adults, pregnant women, and people with weakened immune systems. Symptoms usually start within several days, though they can develop up to two months after eating contaminated food. Symptoms may include diarrhea or other gastrointestinal symptoms followed by fever or muscle aches.

- Blue Bell Creameries Information
- DSHS Health Advisory (html)
- CDC Information
- FDA Information

Flu Surveillance - April 10, 2015

DSHS’s latest flu surveillance report classifies the geographic distribution of flu activity in Texas as “local,” indicating elevated flu-like illness and recent laboratory-confirmed evidence of flu within a region of the state. Additionally, the intensity of influenza-like illness, measuring the proportion of doctor visits prompted by flu-like illness, is currently classified as “low.” DSHS tracks the number of pediatric deaths due to the influenza. This season, 13 Texas children have died from the flu.

DSHS urges everyone six months and older to get vaccinated against the flu. It is particularly important for pregnant women, young children, older adults and people with chronic health conditions, because people in those groups are at a greater risk of severe complications if they do get the flu.

Latest Available DSHS Weekly Flu Surveillance Report
Historical Data - Flu Surveillance Reports
TexasFlu.org

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Last updated April 21, 2015
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Texas DSHS Infectious Disease Outbreak Webpage

Eh NV21, 2014

Officials continue to monitor all travelers who return to Texas from countries with widespread Ebola outbreaks.

Several of those travelers are considered to be at “low risk” of exposure to Ebola and have agreed to avoid public places until they reach the 21-day mark. The rest are considered to be “low risk” contacts and are being monitored for symptoms.

Texas Guidelines for Returning Travelers

Texas has had three confirmed cases of Ebola. Health officials closely monitored about 500 people who had contact with them to watch for symptoms. The last person was cleared from monitoring Nov. 7. No additional cases were diagnosed.

Please visit www.texasebola.org for the latest information about Ebola in Texas.

Flu Surveillance - Nov. 14, 2014

DSHS’s latest flu surveillance report classifies the geographic distribution of flu activity in Texas as “low,” indicating elevated flu activity and recent laboratory-confirmed evidence of flu within a region of the state. Additionally, the percentage of outpatient visits for influenza-like illness, measuring the proportion of doctor visits prompted by flu-like illness, is currently classified as “minimal.”

DSHS urges everyone six months old and older to get vaccinated against the flu. It is particularly important for pregnant women, young children, older adults and people with chronic health conditions, because people in those groups are at a higher risk for complications from influenza.

Latest Available DSHS Weekly Flu Surveillance Reports

Historical DSHS Flu Surveillance Reports

Enterovirus - Nov. 19, 2014

DSHS has confirmed 26 Texas cases of enterovirus D68, a virus that has been responsible for cases of severe respiratory illnesses in more than 40 states. The patients with confirmed cases were residents of Anderson, Bell (2), Collin, Dallas (10), Denton, Grayson, Harris, Johnson, Lubbock (3), Waller and Harris counties. One additional confirmed case was in a resident of another state.

Enterovirus D68 is one of more than 100 enteroviruses that cause mild to severe respiratory disease and usually peak in the summer and fall. It has prompted concern this summer when health officials in Chicago and Kansas City identified unusual clusters of severe respiratory illness in children. More than half of the children involved had a history of asthma or wheezing.
So What is Global Health Security?

- The goal of the Global Health Security initiative is to prevent, detect, and respond to infectious disease threats where they start.
- The initiative consists of the US and partnerships with countries and international organizations.
- A consequence of a more interconnected world is the increasing opportunity for human, animal, and zoonotic diseases to emerge and spread globally.
  - “Global health security is shared responsibility. No one country can achieve it alone. A threat anywhere is indeed a threat everywhere.”
  - Health and Human Services Secretary Kathleen Sebelius

31 GHSA Countries

- Bangladesh
- Burkina Faso
- Cameroon
- Cambodia
- Côte d’Ivoire
- Democratic Republic of Congo
- Ethiopia
- Georgia
- Ghana
- Guinea
- Haiti
- India
- Indonesia
- Jordan
- Kazakhstan
- Kenya
- Laos
- Liberia
- Malaysia
- Mali
- Mozambique
- Pakistan
- Peru
- Rwanda
- Senegal
- Sierra Leone
- Tanzania
- Thailand
- Uganda
- Ukraine
- Vietnam
Threats to Global Health Security

- Five sources of threat to our global health security:
  - The emergence and spread of new microbes
  - The globalization of travel and food supply
  - The rise of drug-resistant pathogens
  - The acceleration of biological science capabilities and the risk that these capabilities may cause the inadvertent or intentional release of pathogens
  - Continued concerns about the acquisition, development, and use of biological agents by state or non-state actors

*White House memo, July 18, 2014*
Examples

• Consider the recent outbreaks of:
  – Middle East Respiratory Syndrome (MERS)
  – H7N9 influenza
  – Ebola

• Are all revealing gaps in the global system for managing emerging biological threats

• The term “security” is used because healthier countries are more stable and prosperous, hence fewer failed states

• The need for enhanced leadership to strengthen global capabilities to prevent, detect, and respond to biological threats, whether naturally occurring, deliberate, or accidental, is acute
## Basic Reproduction Number or Rate (Ro)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Transmission</th>
<th>$R_o$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles</td>
<td>Airborne</td>
<td>12 - 18</td>
</tr>
<tr>
<td>Pertussis</td>
<td>Airborne droplet</td>
<td>12 - 17</td>
</tr>
<tr>
<td>Smallpox</td>
<td>Airborne droplet</td>
<td>5 - 7</td>
</tr>
<tr>
<td>Polio</td>
<td>Fecal-oral</td>
<td>5 - 7</td>
</tr>
<tr>
<td>Mumps</td>
<td>Airborne droplet</td>
<td>4 - 7</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Sexual contact</td>
<td>2 - 5</td>
</tr>
<tr>
<td>SARS</td>
<td>Airborne droplet</td>
<td>2 - 5</td>
</tr>
<tr>
<td>Ebola</td>
<td>Bodily fluids</td>
<td>1 - 2</td>
</tr>
</tbody>
</table>

$R_o$ is the estimate of the number of cases a single case generates, on average, during the course of its infectious period.
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THE GLOBAL AVIATION NETWORK
DISEASE CAN SPREAD NEARLY ANYWHERE WITHIN 24 HOURS

Image from openflights.org

SARS cost the world $30 billion in just 4 months
A rapid, effective response could have avoided most of this.
National Strategy for Countering Biological Threats: Global Health Security Agenda

- **Prevent avoidable outbreaks**
  - Prevent the emergence and spread of antimicrobial drug resistant organisms and emerging zoonotic diseases, and strengthen international regulatory frameworks governing food safety
  - Promote national biosafety and biosecurity systems
  - Reduce the number and magnitude of infectious disease outbreaks

- **Detect Threats Early**
  - Launch, strengthen and link global networks for real-time biosurveillance
  - Strengthen the global norm of rapid, transparent reporting and sample sharing in the event of health emergencies
  - Develop and deploy novel diagnostics and strengthen laboratory systems
  - Train and deploy an effective biosurveillance workforce

- **Respond Rapidly and Effectively**
  - Develop an interconnected global network of Emergency Operations Centers and multisectoral response to biological incidents
  - Improve global access to medical and non-medical countermeasures during health emergencies
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What Can/Should You Do?

- For yourself and your family
  - Make sure you and your family are immunized
  - Develop good health habits – regular hand washing
  - Discuss the issues and monitor for developments (and as we’ve learned with Ebola, while effectively managing the data)
What Can/Should You Do?

- For your workplace:
  - Appoint someone to regularly monitor for developments – worldwide
    - Subscribe to the Health Alert Network (HAN) hosted by the CDC
    - Monitor Dept. of Health website
  - Procure the key reference for communicable diseases so you will have the facts – not media hype
    - APHA Control of Communicable Diseases Manual
  - Evaluate international impacts (supply chain and travel) – assess health warnings
  - Dedicate some of your professional development training efforts towards a better understanding of infectious disease
What Can/Should You Do?

- For your workplace (continued):
  - Plan ahead – how might an outbreak (real or perceived) affect your business? Here and abroad?
  - Make sure outbreaks are one of the perils considered in your emergency response and business continuity plans
  - Policies for sick leave and time away from work
  - Consider stockpiles of protective equipment, cleaners, thermometers
  - Consider how you will communicate with employees and how work might be accomplished in a modified manner
  - Provide tips to workers about protecting their families
Summary

• The five sources of threat to our Global Health Security consists of:
  1. The emergence and spread of new microbes
  2. The globalization of travel and food supply
  3. The rise of drug-resistant pathogens
  4. The acceleration of biological science capabilities and the risk that these capabilities may cause the inadvertent or intentional release of pathogens
  5. Continued concerns about the acquisition, development, and use of biological agents by state or non-state actors

• The national strategy to address these threats consists of:
  – Preventing avoidable outbreaks
  – Detecting threats early
  – Responding rapidly and effectively
Summary (cont.)

- Although there are four main professions focused on the control and prevention of infection.....
  1. Infection prevention
  2. Biosafety professional
  3. Registered environmental health specialists
  4. Public health
- No single profession is sufficient to address this global challenge, hence why it is prudent for health and safety professionals of all types to be knowledgeable of the threat in order to aid in preparedness and response efforts
Useful References

- American Biological Safety Association [www.absa.org](http://www.absa.org)
- American Public Health Association [www.apha.org](http://www.apha.org)
- American Society for Microbiology [www.asm.org](http://www.asm.org)
  - CDC HAN Network [http://emergency.cdc.gov/HAN/](http://emergency.cdc.gov/HAN/)
- Association for Professionals in Infection Control and Epidemiology [www.apic.org](http://www.apic.org)
- National Environmental Health Association [www.neha.org](http://www.neha.org)
- Texas DSHS outbreak website: [http://www.dshs.state.tx.us/news/updates.shtm](http://www.dshs.state.tx.us/news/updates.shtm)