



1. Outbreak Management of Infection
2. Infection control committee, team ,&nurse

Based on WHO Guidelines

# Outline

- Definition
  - Outbreak
  - Outbreak Management
- Detection of an Outbreak
- Confirmation of an Outbreak
- Definition and Agreement Response
- Management of Response
- Public Information
  - Means of public information
  - Content of public information
- Post-outbreaks activities

# What is an outbreak?

- The term outbreak is generally used when the number of cases observed is greater than the number normally expected in the same geographic area for the same period of time.
  - Example: the occurrence of a measles outbreak in a highly immunized populations does not necessarily represent a failure of the routine immunization programme.

# What is Outbreak Management?

- (OM) is the PHIN functional area intended to support the needs of investigation, monitoring, management, analysis, and reporting of a public health event or act of bioterrorism.

[www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov) › NCBI › Literature › PubMed Central (PMC)

# Detection flow of outbreaks



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# Confirmation of an Outbreak

- A preliminary case investigation must be carried out to confirm the diagnosis, assess the extent of the outbreak and identify the population at risk. This is best done by health workers using a standard form, seeking details on cases (e.g. clinical syndrome and immunization status) and contacts.
- It is important that specimen samples be collected from the initial 10 reported cases of an outbreak, to confirm or not what virus causes the outbreak.

(Example in the case of measles outbreak: For countries in the measles elimination phase, laboratory investigation of all suspected measles cases is mandatory.)

- Specimen samples should be taken and sent to reference laboratories to allow virus isolation for genomic sequencing and mapping purposes. This information will be valuable in tracking virus circulation and establishing virus importation.

- The collected data should be analyzed locally and rapidly to determine the extent of the outbreak and consequently the population at risk. This can be done by creating a line listing of cases with key variables or, more efficiently by entering the data into a computer programme.
- Analysis should include the construction of an epidemic curve, graphing the age distribution of cases and spot-mapping the cases.
- In addition, the investigation must document measures taken so far and any identifiable reasons for the outbreak.

# Definition and agreement on response



The activities to be implemented as a priority during infection outbreaks will be:

1. to prevent complications and deaths through early and effective case management.
2. to review epidemiological data in order to identify the cause(s) of the outbreak
3. to increase public awareness of infection, treatment and prevention
4. to strengthen existing routine programmes, with particular attention to the identification of high-risk areas.



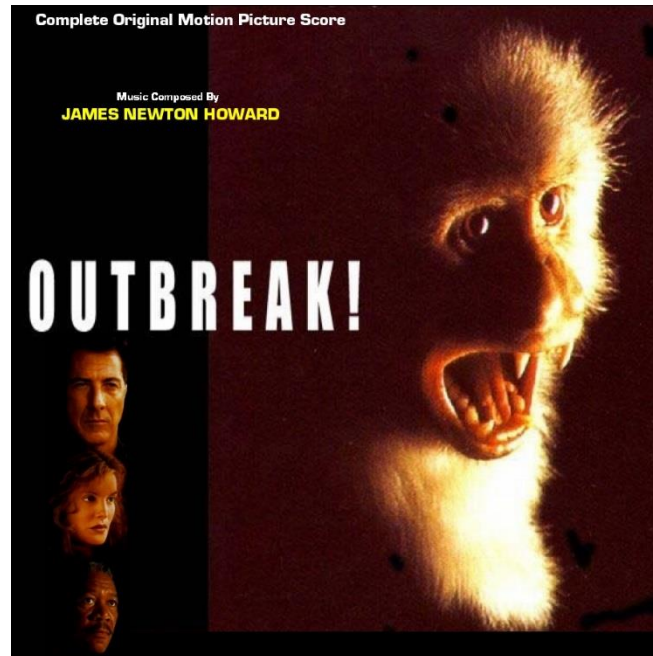
# Example Case: Measles



In countries in the measles outbreak prevention phase and elimination phase, a further range of activities may be undertaken, such as:

- ✓ · *intensive measles surveillance* (weekly reporting, including reporting that no cases have occurred – zero reporting) and investigation of all suspected cases
- ✓ · *accelerated immunization activities* (i.e. improving coverage amongst high risk populations and supplementary immunization in areas not yet affected by the outbreak).

PRIORITY DURING OUTBREAKS IS  
TO PROVIDE APPROPRIATE  
TREATMENT AND  
REDUCE MORTALITY



# Public Information



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Organization

- When an outbreak is declared, there is likely to be widespread public concern and media attention.
- It is important to keep the public informed about the outbreak and the outbreak response.
- A single spokesperson must be appointed and made known to the media
- Regular press release and conferences are essential to help the media play their role and help avoid “media hounding” of team members.

# Means of Public Information



- Community
  - schools
  - community meetings
  - mass media such as radio, newspapers and television.

Simple, clear public information material can help to:

- Allay fears
- Convey public health messages regarding appropriate treatment of cases.



# Content of Public Information

- natural history of infection,
- the care of a affected person
- the signs and symptoms that should prompt to seek expert advice
- encourage the family members to notify health workers recent onset of symptoms such as fever, rashes (depending on the infection type)
- Preventive measures

# Post-outbreak activities

- After an outbreak, the Epidemic Response Team must carry out a thorough evaluation of the following:
  - ✓ cause of the epidemic
  - ✓ surveillance of measles and detection of the outbreak
  - ✓ preparedness for the epidemic
  - ✓ management of the epidemic
  - ✓ programme goals and operations.

The findings of this evaluation should be documented in a written report containing clear recommendations regarding:

- epidemiological characteristics of the epidemic
- surveillance (example: assess the surveillance system, recommend actions to enhance measles surveillance in the affected areas)
- preparedness / recommend action to improve outbreak response
- Programme activities and strategies to increase coverage and cover high-risk areas.



PREVENTING INFECTIONS · PROTECTING PEOPLE · RESPONDING TO THREATS · SAVING LIVES



NATIONAL CENTER FOR  
PREPAREDNESS, DETECTION,  
AND CONTROL OF  
INFECTIOUS DISEASES

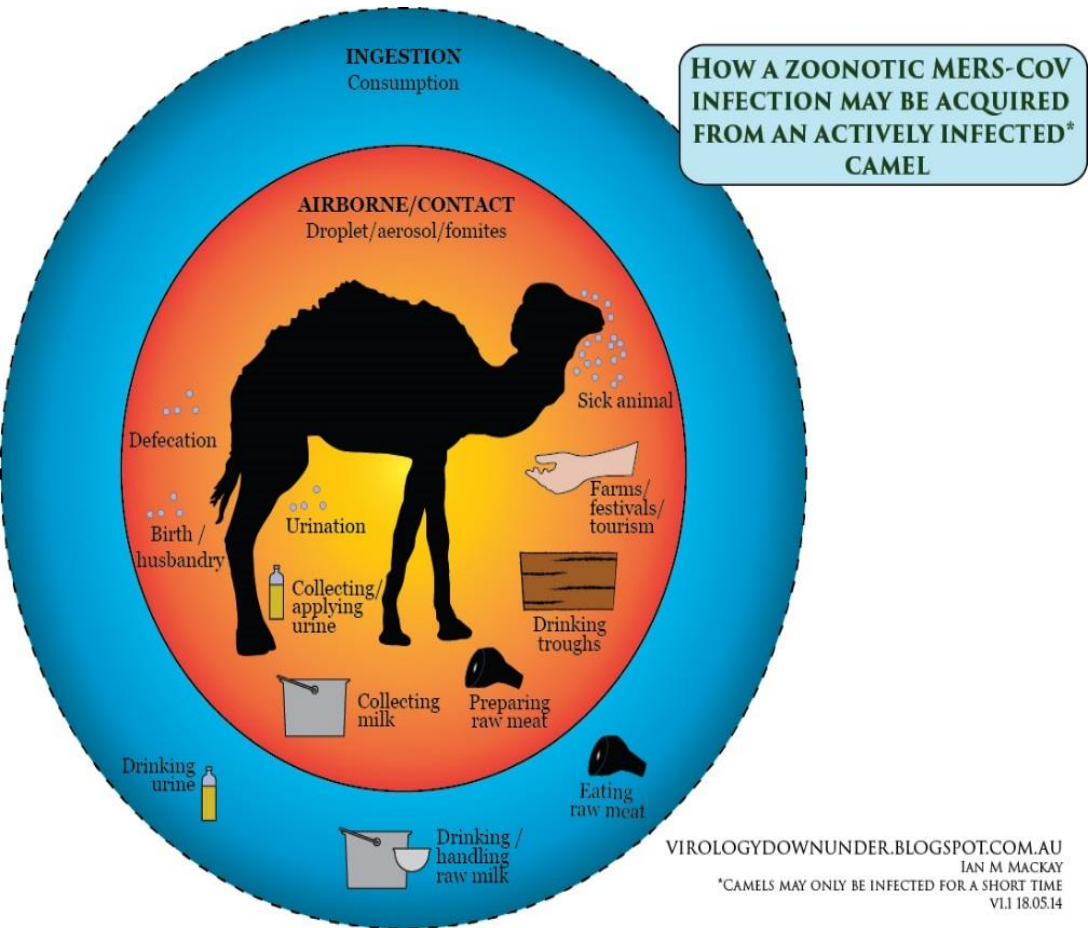


# National Issues: Different Outbreaks in Different Countries

# Outline

- Middle East
- West Africa
- China
- Uganda

# Middle East



## MERS-CoV ( Middle East Respiratory Syndrome- Corona Virus)

- is a viral respiratory illness that is new to humans.
- It was first reported in Saudi Arabia in 2012 and has since spread to several other countries, including the United States.
- Most people infected with MERS-CoV developed severe acute respiratory illness, including fever, cough, and shortness of breath. Many of them have died.



Centers for Disease Control and Prevention

CDC 24/7: Saving Lives, Protecting People™

# Issues in the outbreak MERS-CoV

- Unknown mode of transmission
  - MERS-CoV outbreaks uncertainty prevailed with the mode of transmission being unknown.
- Inadequate environmental controls and isolation
  - patients with airborne infectious disease will pose a risk to other patients and healthcare workers.
- Healthcare associated transmission
  - The majority of patients in the Jeddah MERS-CoV outbreak had contact with a health care facility, other patients, or both. This highlights the role of health care–associated transmission. (Supported by the Ministry of Health, Saudi Arabia, and by the U.S. Centers for Disease Control and Prevention.)
- Temporary Airborne Infections isolation facilities were provided
  - provide a useful rapid response resource for patient isolation, physical barriers, air controls and staff safety precautionary measures during the uncertainty created by a novel corona virus outbreak.

# West Africa



- Ebola virus disease (EVD), formerly known as Ebola haemorrhagic fever, is a severe, often fatal illness in humans.
- The virus is transmitted to people from wild animals and spreads in the human population through human-to-human transmission.
- The average EVD case fatality rate is around 50%. Case fatality rates have varied from 25% to 90% in past outbreaks.
- The first EVD outbreaks occurred in remote villages in Central Africa, near tropical rainforests, but the most recent outbreak in west Africa has involved major urban as well as rural areas.



# Issues in the outbreak of Ebola

- Response teams reported lacking adequate training in case investigation, contact tracing, infection control (including safe burial practices), and health education
- Lack of trained personnel in remote areas
- Poor transportation and communication network
- Insufficient number of trained contact tracers to manage the growing number of cases.
- Essential drugs were reported lacking at rural health clinics
- Health Workers had limited supply of personal protective equipment.
- Health workers lacks training in proper use of personal protective equipment.

# China

- Avian influenza A(H7N9) is a subtype of influenza viruses that have been detected in birds in the past.
- This particular A(H7N9) virus had not previously been seen in either animals or people until it was found in March 2013 in China.
- Most of the cases of human infection with this avian H7N9 virus have reported recent exposure to live poultry or potentially contaminated environments, especially markets where live birds have been sold.
- This virus does not appear to transmit easily from person to person, and sustained human-to-human transmission has not been reported.



# Issues in the outbreak of Avian Influenza (H7N9)

- Great challenge in the surveillance
  - Farmers and government officials have economic reasons for not reporting suspected avian influenza outbreaks in an area.
  - Weakened and privatized health care system
    - Prevents many sick people from seeking care at a health care facility, where reporting would originate.
  - Local officials who control the work of the sectors under their jurisdiction may hide cases of disease if they suspect that reporting might result in economic losses in their communities
- Poorly prepared for a rapid response to an outbreak event.
- Crisis-management capability and ability to coordinate different agencies, such as the Ministry of Agriculture and the Ministry of Health, is weak, especially at the local level



# Uganda Typhoid Fever



- On 24 February 2015, the Ministry of Health of Uganda notified WHO of a typhoid fever outbreak.
- is a bacterial disease caused by *Salmonella typhi*.
- It is transmitted through the ingestion of food or drink contaminated by the feces or urine of infected people.
- Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhoea, rose-coloured spots on the chest, and enlarged spleen and liver.
- Healthy carrier state may follow acute illness. Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread. Healthy carriers should be excluded from handling food.



# Issues on the outbreak of Typhoid Fever

- Poor hygiene practices
- Contaminated drinking water
- Underreporting of milder illnesses and delayed and inadequate antimicrobial treatment contributed to high perforation rate
- Unknown biology of this human-adapted bacterial pathogen and the complexity of the disease in endemic areas, especially those in Africa
- The main barriers to control are vaccines that are not immunogenic in very young children.
- The development of multidrug resistance which threatens efficacy of antimicrobial chemotherapy



## **Global Issues**

# Outline

- Introduction
- Top 10 Diseases causing the most outbreaks
  - Zoonoses
  - Human Specific
- Infection Control Challenges

# Introduction

- Infectious diseases are a global concern
- Second common cause of death the world
- In a research study, analysis revealed that 65 percent of diseases in the dataset were "zoonoses," meaning they come from animals.
- Of the annual 15 million deaths, 95% occur in the developing countries (WHO, 2008)
  - Acute Respiratory Infections
  - Diarrheal diseases
  - Measles
  - AIDS
  - Malaria
  - Tuberculosis
- More than 1 billion inhabitants in this part of the world do not have access to safe water and basic sanitation
- Healthcare Associated Infections (HCAIs) constitute a health challenge worldwide and pose a major threat to patient safety.

- Risks for acquiring the infections during health care delivery have increased dramatically with advances in treatment and procedures.
- In developing countries infection prevention and control policies are either nonexistent, poorly adapted or insufficiently funded by government. Therefore, infection are between 2-6 times higher than those in developed world.
- The endemic burden of HCAs is significantly higher in developing countries, in particular in patients admitted to ICU and neonates
- Most developing countries lack surveillance system for HCAs

# Top 10 Diseases causing the most outbreaks

# For Zoonoses: Top 10 Lists

1. Salmonella
2. E. Coli
3. Influenza A
4. Hepatitis A
5. Anthrax
6. Dengue Fever
7. Shigellosis
8. Tuberculosis
9. Chikungunya
10. Trichinosis



# Human Specific Infections

1. Gastroenteritis
2. Cholera
3. Measles
4. Enterovirus
5. Bacterial Meningitis
6. Legionellosis
7. Typhoid
8. Enteric Fever
9. Rotavirus
10. Mumps
11. Pertussis (Whooping Cough)



# The Ministry of Health Kingdom of Saudi Arabia

# Outline

- Different Divisions



وزارة الصحة  
Ministry of Health

## Divisions

- Quality Division
- Central Sterilization Department
- Training and Research Division
- Surveillance and Statistics Division
- Staff Health Division
- Infection Control Division

# Monitoring and Evaluation

Based on the Global Disease  
Detection Program in collaboration  
with the Center for Disease Control

# Outline

- Overview
- Monitoring and Evaluation
  - Five Key Activities
  - Collaborations
  - Internal Partners

# Overview

## Global Disease Detection Program

- GDD is CDC's principal and most visible program for strengthening global health security and developing public health capacity to rapidly identify and contain disease threats around the world.
- The program is comprised of field-based and CDC headquarters-based components.

# GDD Regional Centers

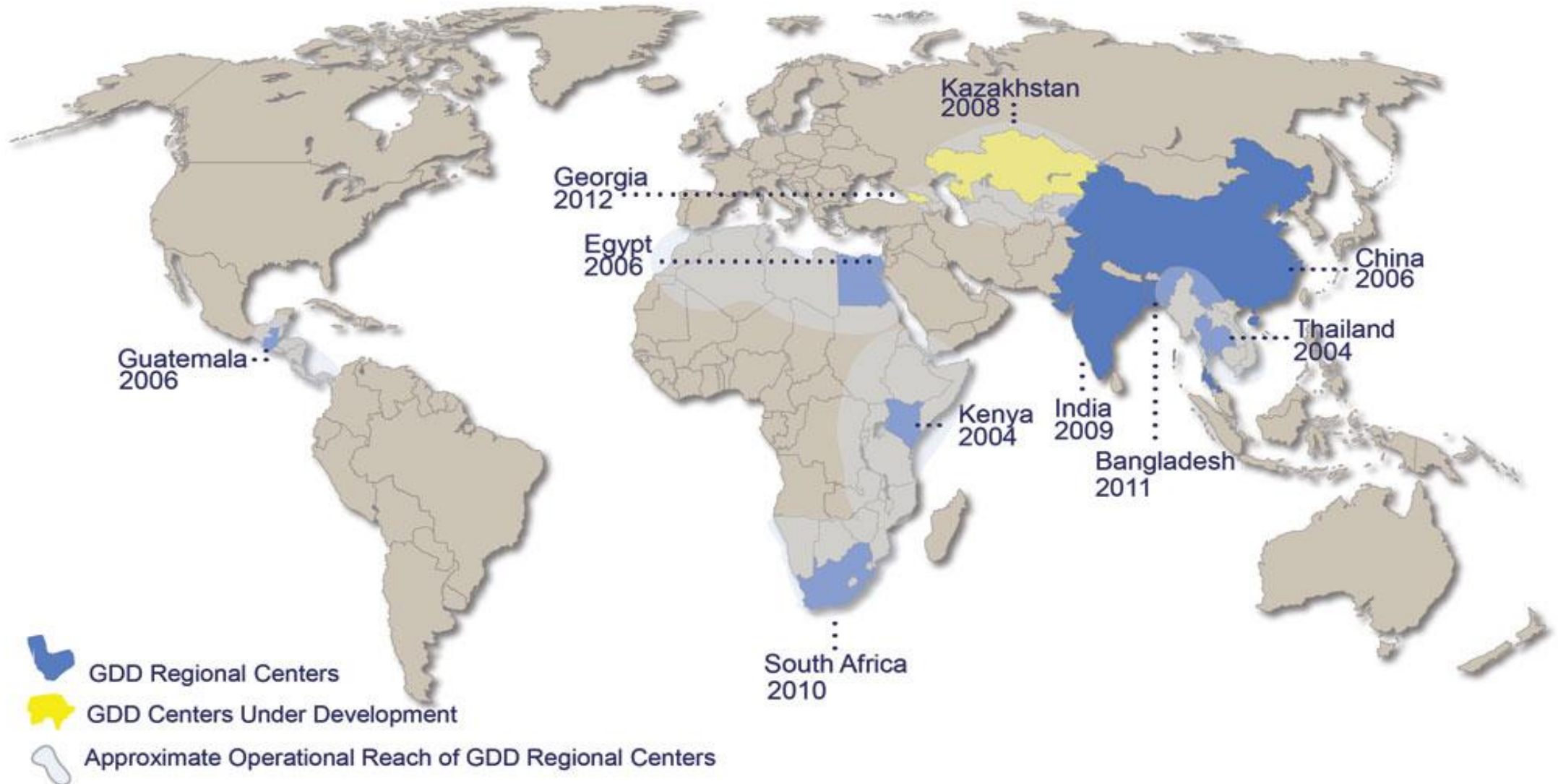
- A central focus of GDD is establishing and expanding GDD Regional Centers that build broad-based public health capacity in support of the IHR.
- CDC currently operates eight GDD Regional Centers at varying levels of capacity.
- GDD Regional Centers work with the host country and within the region to develop the six core capacities.



# Six Core

1. Emerging infectious disease detection and response
2. Training in field epidemiology and laboratory methods
3. Pandemic influenza preparedness and response
4. Zoonotic disease detection and response at the animal-human interface
5. Emergency preparedness and risk communication
6. Laboratory systems strengthening

# GDD Operation Centers



# Monitoring and Evaluation

- GDD developed a comprehensive monitoring and evaluation (M&E) program in 2006 which has been used to measure progress towards building capacity to rapidly detect and contain emerging disease threats.
- This program monitors and evaluates capabilities and progress on a quarterly basis using a framework that includes quantitative and qualitative information about five key activities.

# Five Key Activities

## 1. Outbreak Response

- Ensure outbreak investigations and responses are timely and comprehensive.

## 2. Pathogenic Diversity

- Advance public health knowledge through innovative research into the epidemiology and biology of emerging infections and identify novel threats before they spread

## 3. Training

- Build capacity and improve the quality of epidemiology and laboratory science through applied training



4.  
Surveillance

- Strengthen surveillance systems capable of detecting, assessing, and monitoring the occurrence and public health significance of infectious disease threats



5.  
Networking

- Enhance collaboration through shared resources and synergy

# Collaboration

- GDD collaborates closely with Centers and programs at CDC to accomplish its mission.
- This collaboration allows GDD to draw upon expertise from across the agency.
- GDD also works closely with a variety of in-country partners including Ministries of Health, academic institutions, other U.S. government programs, and international and non-government organizations.
- These partners contribute funding, expertise, and other resources towards GDD projects and goals.
- Therefore, the results of the M&E reflect the shared accomplishments of GDD and its partners.

# Internal Partners



Center for Global Health

- Division of Global HIV/AIDS
- Division of Parasitic Diseases and Malaria
- Division of Public Health Systems and Workforce Development

# Internal Partners



National Center for Birth  
Defects and Developmental  
Disabilities

The Division of  
Birth Defects and  
Developmental  
Disabilities

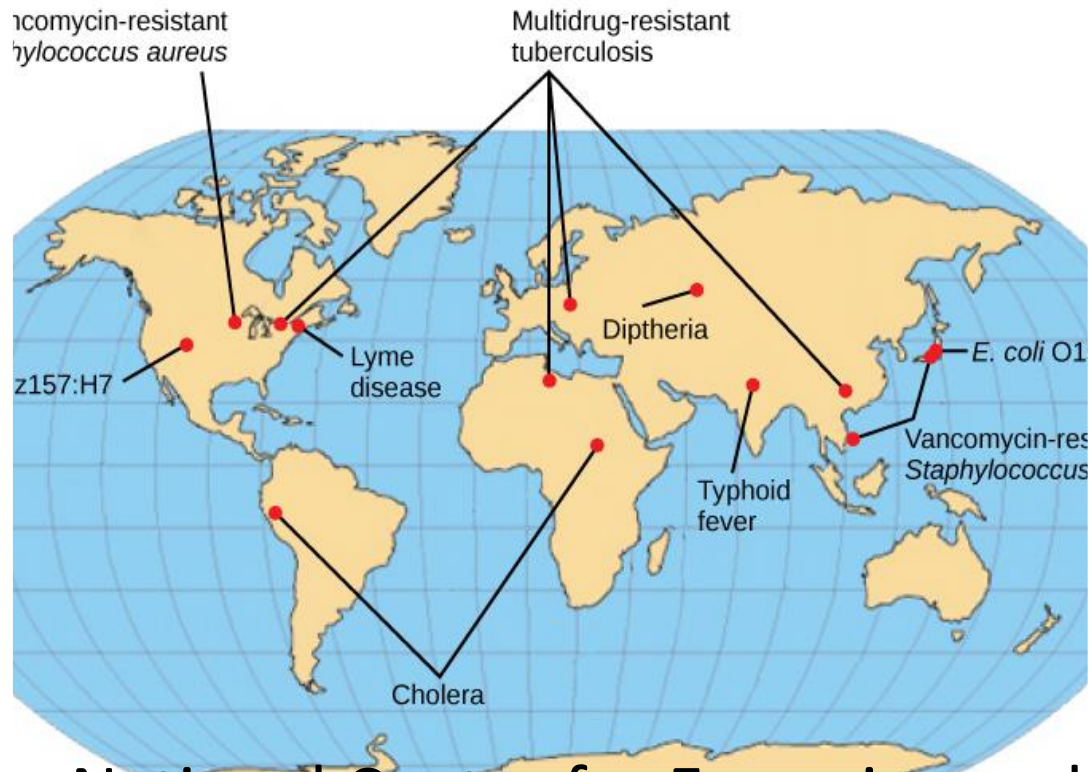




National Center for  
Environmental Health

Division of  
Emergency and  
Environmental  
Health Services

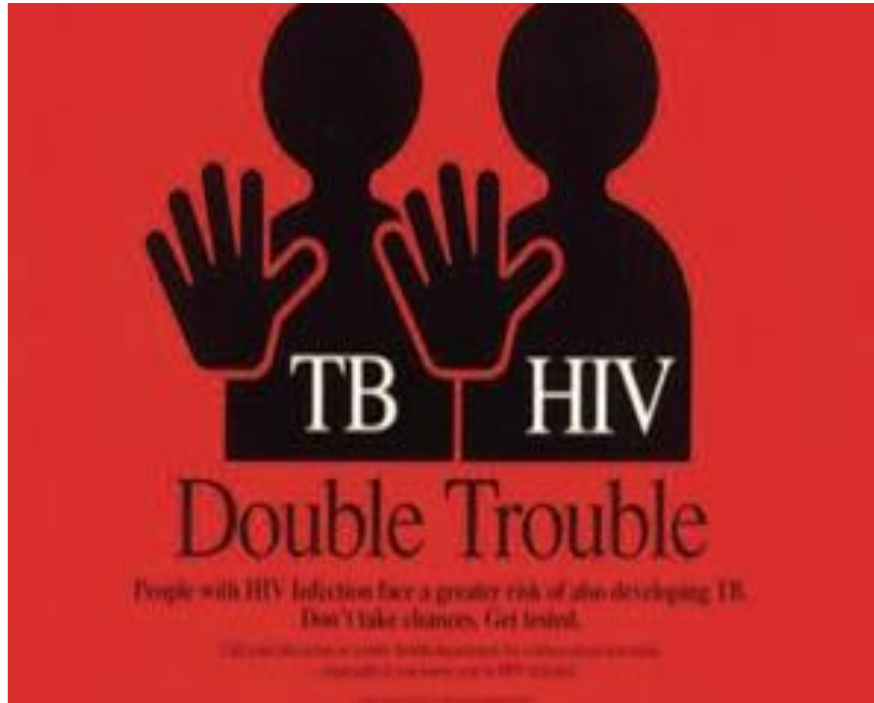
# Internal Partners



National Center for Emerging and Zoonotic Infectious Diseases

- Division of Foodborne, Waterborne, and Environmental Diseases
- Division of Global Migration and Quarantine
- Division of Healthcare Quality Promotion
- Division of High-Consequence Pathogens and Pathology
- Division of Preparedness and Emerging Infections
- Division of Preparedness and Emerging Infections
- Division of Vector-borne Diseases

# Internal Partners



National Center for  
HIV/AIDS, Viral  
Hepatitis, STD and TB  
Prevention

- Division of TB  
Elimination
- Division of Viral  
Hepatitis

# Internal Partners



National Center for  
Immunization and  
Respiratory Diseases



- Division of Bacterial Diseases
- Division of Viral Diseases
- Influenza Division
- Global Immunization Division

**Infection control committee, team  
and nurse**

# Infection control program at Health

## Function and organization of the infection control program:

- The provision of an effective infection control program (ICP) is a key to the quality and a reflection of the overall standard of care provided by the health care institution.
- Major differences among countries in their health care resources and organization, and medical cultures explain the diversity of approaches to the organization of hospital hygiene and infection control programs.
- The growth in ICP has been paralleled by the establishment and growth of a number of professional and governmental organizations which focus on Nosocomial infection prevention and control.

## Infection control Committee (ICC):

- The hospital ICC is charged with the responsibility for the planning, evaluation of evidenced-based practice and implementation, prioritization and resource allocation of all matters relating to infection control.
- The ICC must have a reporting relationship directly to either administration or the medical staff to promote ICP visibility and effectiveness.
- The ICC should meet regularly (monthly) according to local need.
- The membership of the hospital ICC should reflect the spectrum of clinical services and administrative arrangements of the health care facility.

## As a minimum, the committee should include:

- Chief executive, or hospital administrator or his/her nominated representative.
- ICD or hospital microbiologist (chairperson).
- Infection Control Nurse (ICN).
- Infectious Diseases Physician (if available)
- Director of nursing or his representative.
- Occupational Health Physician (if available).
- Representative from the major clinical specialities.
- Additionally representatives of any other department (pharmacy, central supply, maintenance, housekeeping...etc) may be invited as necessary.



# The ICC has the following tasks:

- To review and approve the annual plan for infection control.
- To review and approve the infection control policies.
- To support the IC team and direct resources to address problems as identified.
- To ensure availability of appropriate supplies.
- To review epidemiological surveillance data and identify area for intervention.
- To assess and promote improved practice at all levels of the health care facility.
- To ensure appropriate training in infection control and safety.
- To review risks associated with new technology and new devices prior to their approval for use.
- To review and provide input into an outbreak investigation
- To communicate and cooperate with other committees with common interests such as antibiotic committee, occupational health committee....etc.

# Role of Infection Control Team:

- The role of ICT is:
- Ensure that an effective ICP has been planned, co-ordinate its implementation, and evaluate the impact of such measures.
- It is important to ensure that there is a 24-hour access to the ICT for advice on infection prevention and control which would include both medical and nursing advice.
- To develop an annual infection control plan with clearly defined objective.

# Role of Infection Control Team:

- To develop written policies and procedures including regular evaluation and update.
- To supervise and monitor daily practices of patient care designed to prevent infection.
- To ensure availability of appropriate supplies
- To organize an epidemiological surveillance program (particularly in high risk areas for early detection of outbreak).
- To educate all grades of staff in infection control policy, practice and procedures.
- To develop and implement annual training plan for all health care workers.

# Role of Infection Control Team:

- To have scientific and technical support role in purchasing and monitoring of equipment and supplies.
- To participate with the pharmacy and antibiotic committee in developing a program for supervising the use of antibiotics.
- To participate in the audit activity.
- To submit monthly reports on activities to IC.

# Nursing Responsibilities

- **Clinical care staff and other health care workers are the frontline defence for applying daily infection control practices to prevent infections and transmission of organisms to other patients.**
- **Although training in preventing blood borne pathogen exposures is required annually by the Occupational Safety and Health Administration, clinical nurses (registered nurses, licensed practical nurses, and certified nursing assistants) and other health care staff should receive additional infection control training and periodic evaluations of aseptic care as a planned patient safety activity.**

# Nursing Responsibilities

- **Nurses have the unique opportunity to directly reduce health care–associated infections through recognizing and applying evidence-based procedures to prevent HAIs among patients and protecting the health of the staff.**
- **Clinical care nurses directly prevent infections by performing, monitoring, and assuring compliance with aseptic work practices; providing knowledgeable collaborative oversight on environmental decontamination to prevent transmission of microorganisms from patient to patient; and serve as the primary resource to identify and refer ill visitors or staff.**

# Infection Control Nurse (ICN)

- **An Infection Control Nurse or Practitioner is a registered nurse with an additional academic education and practical training which enables him or her to act as a specialist advisor in all matters relating to infection control.**
- **A recognized qualification in infection control should be held which will allow recognition of the ICN as a specialist practitioner.**

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