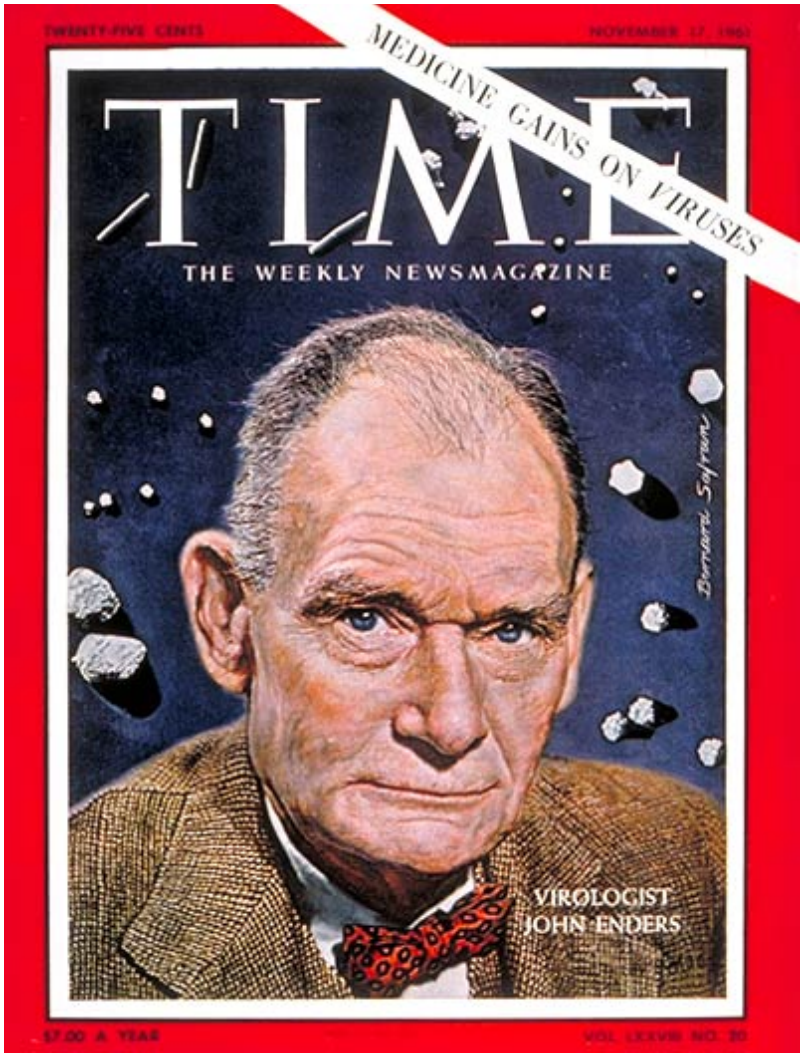
Common Infectious Disease Problems

AVERA INFECTION PREVENTION DAY OF SHARING

Fares Masannat, MD
Infectious Diseases
Avera Medical Group IDS

Viral Infections


TIME
THE WEEKLY NEWSMAGAZINE
POLIO FIGHTER SALK
Is this the year?


TWENTY-FIVE CENTS
MEDICINE GAINS ON VIRUSES
TIME
THE WEEKLY NEWSMAGAZINE
VIROLOGIST
JOHN ENDERS
$7.00 A YEAR

QUARANTINE

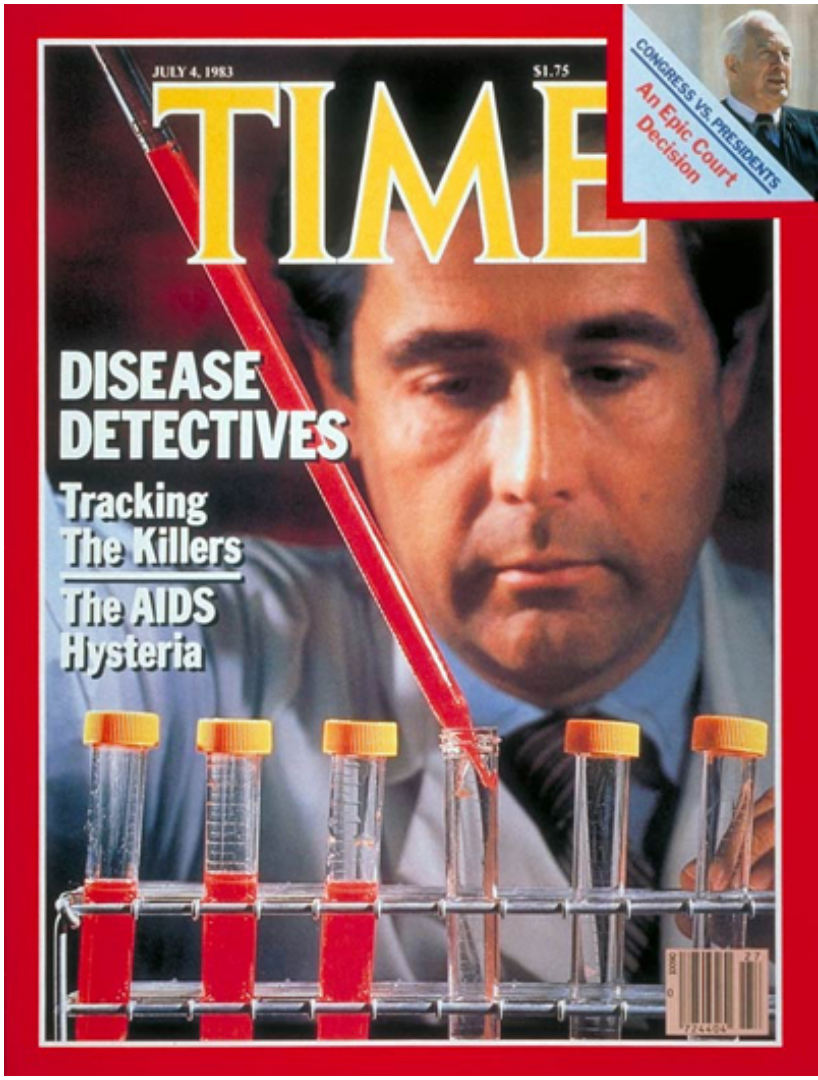
POLIOMYELITIS

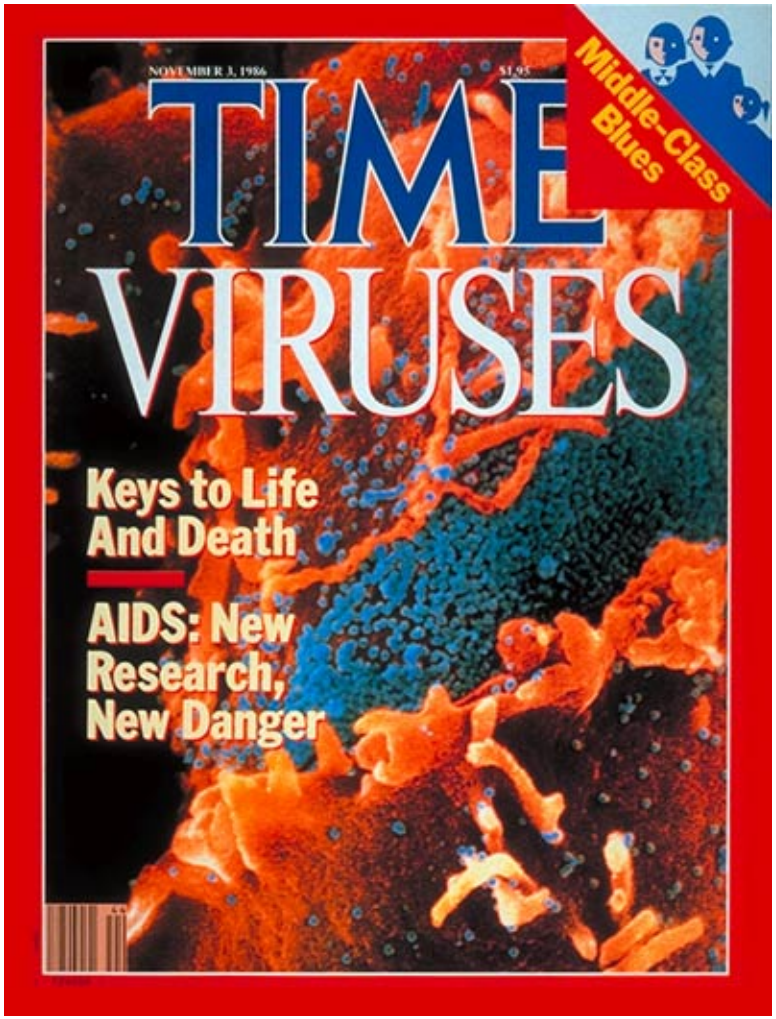
All persons are forbidden to enter or leave these premises without the permission of the HEALTH OFFICER under PENALTY OF THE LAW.

This notice is posted in compliance with the SANITARY CODE OF CONNECTICUT and must not be removed without permission of the HEALTH OFFICER.

Form D-5-Ps. _____ Health Officer.


AUGUST 2, 1982
$1.50
TIME
A Grim Week In Britain
TODAY'S SCARLET LETTER
Herpes


JULY 4, 1983
$1.75
TIME
CONGRESS VS. PRESIDENTS
An Epic Court Decision
DISEASE DETECTIVES
Tracking The Killers
The AIDS Hysteria


NOVEMBER 3, 1986
$1.95
TIME
VIRUSES
Keys to Life And Death
AIDS: New Research, New Danger
Middle-Class Blues

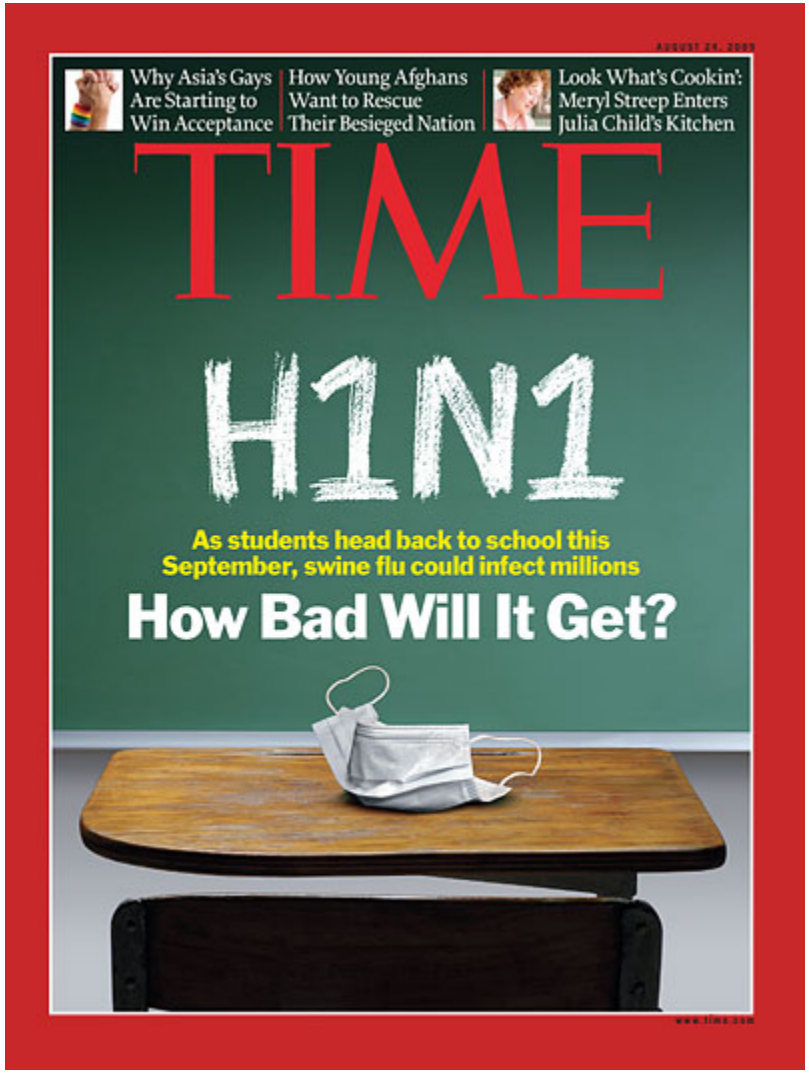

MARCH 9, 1998
TIME
South Korea's Big Day
THE FLU HUNTERS
Did Hong Kong's chickens die in vain? The inside story of how medical detectives stopped one epidemic—but fear another may be on the way


MAY 5, 2003
www.timeeurope.com AOL Keyword: TIME
TIME
THE TRUTH ABOUT
SARS
WHY the virus spreads
China's COVER-UP
How SCARED should you be?

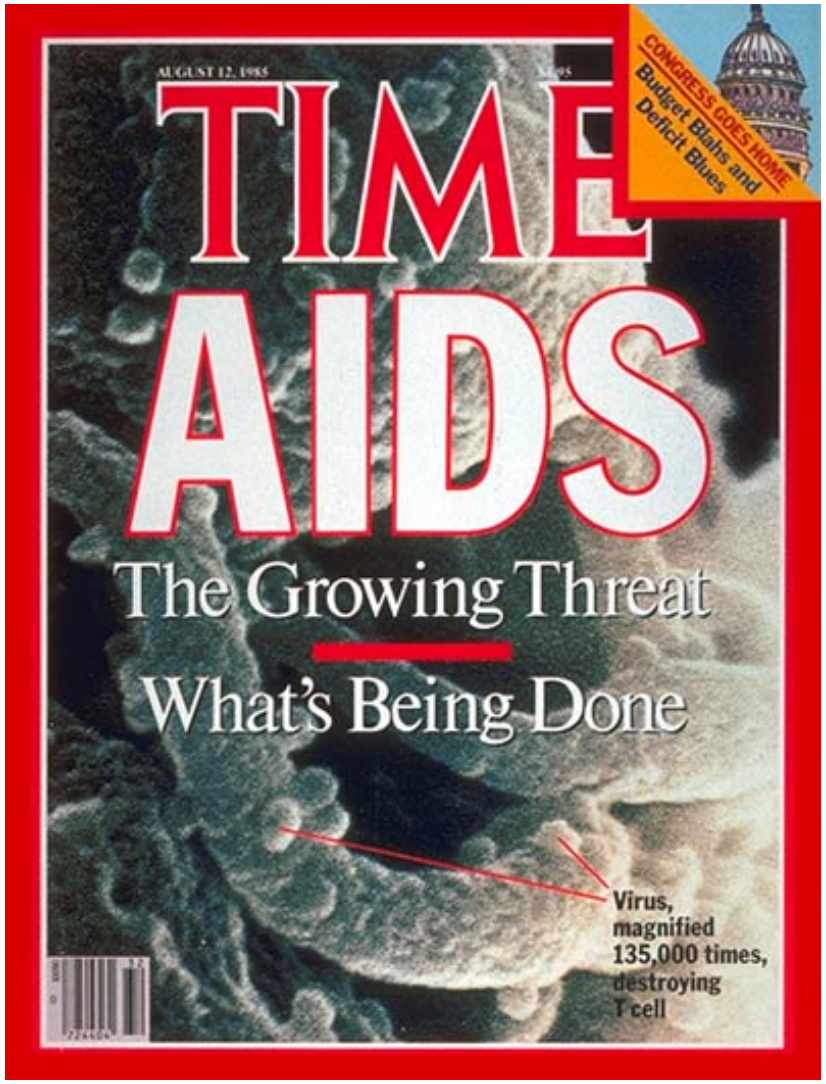

www.timeasia.com
MAY 5, 2003
TIME
SARS NATION
How this epidemic is transforming China

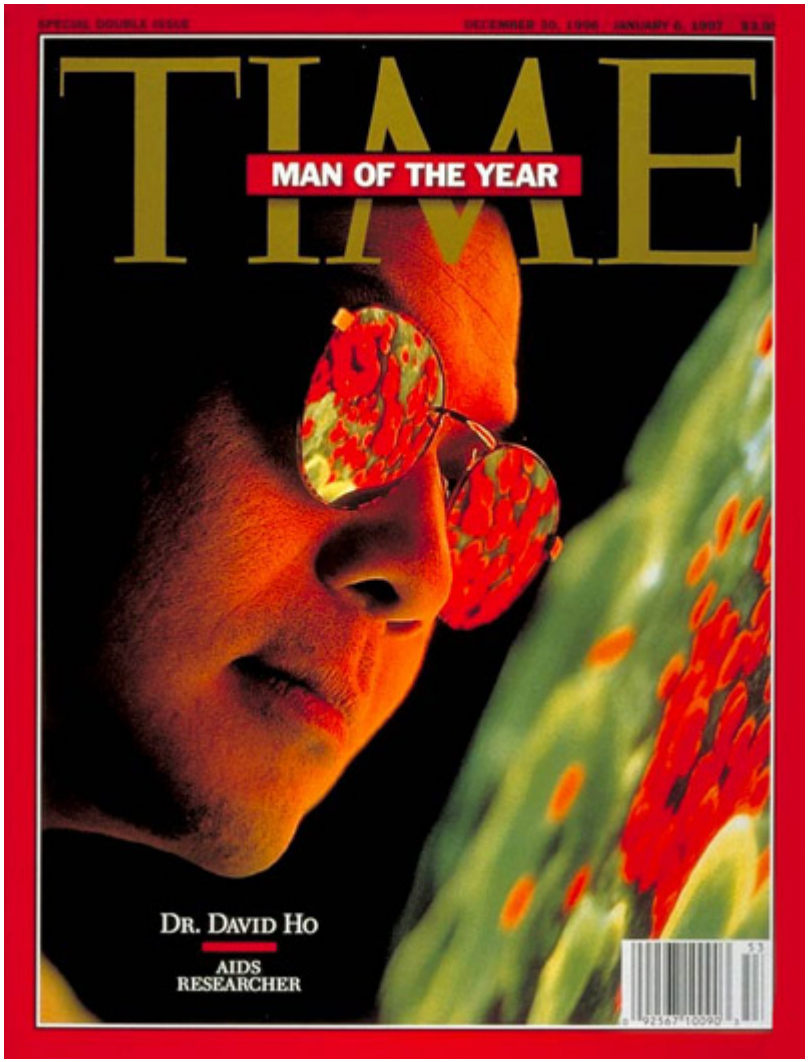

www.timeasia.com
FEBRUARY 9, 2004
TIME
BIRD FLU
Is Asia hatching the next human pandemic?


www.timeasia.com
SEPTEMBER 26, 2005
TIME
IRAQ: IS IT TOO LATE TO WIN THIS WAR?
AVIAN FLU
DEATH THREAT
SPECIAL REPORT: Inside the global race to avert a pandemic


AUGUST 24, 2009
Why Asia's Gays Are Starting to Win Acceptance
How Young Afghans Want to Rescue Their Besieged Nation
Look What's Cookin': Meryl Streep Enters Julia Child's Kitchen
TIME
H1N1
As students head back to school this September, swine flu could infect millions
How Bad Will It Get?
www.time.com


JANUARY 14, 2013
SUKETU MEHTA ON INDIA'S RAPE CULTURE
AFTER THE CLIFF: THE NEXT U.S. FISCAL CRISES
TIME
KILLING POLIO
One thing stands in the way of wiping out the virus for good: the Taliban
BY JEFFREY KLUGER
www.time.com


AUGUST 12, 1985
TIME
CONGRESS GOES HOME
Budget Blahs and Deficit Blues
AIDS
The Growing Threat
What's Being Done
Virus, magnified 135,000 times, destroying T cell

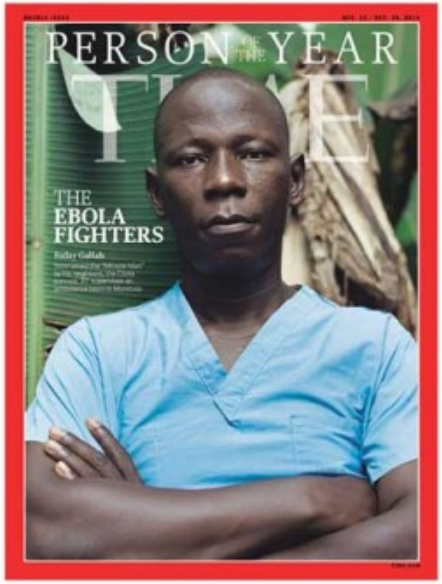

TIME
MAN OF THE YEAR
DR. DAVID HO
AIDS RESEARCHER


PERSON OF THE YEAR
TIME
THE
EBOLA
FIGHTERS
Salome Karwah


PERSON OF THE YEAR
TIME
THE
EBOLA
FIGHTERS
Ella Watson-Stryker

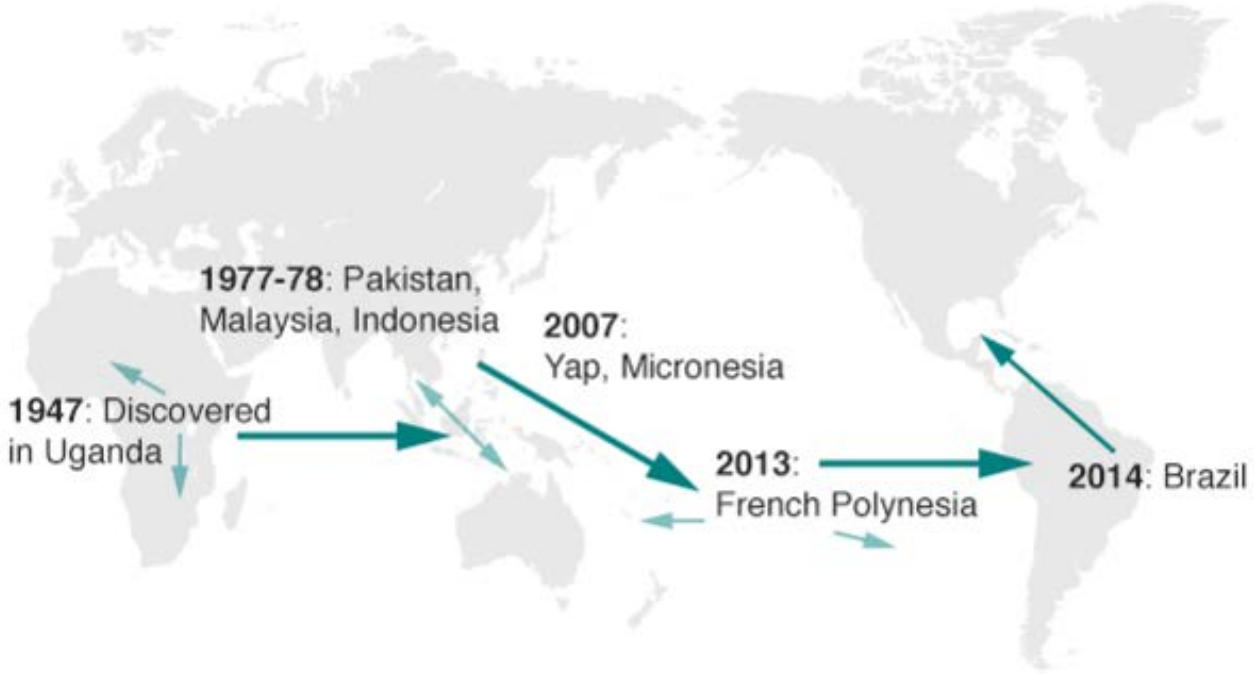

DOUBLE ISSUE
DEC. 22 / DEC. 29, 2014
PERSON OF THE YEAR
TIME
THE
EBOLA
FIGHTERS
Dr. Jerry Brown
The Liberian surgeon, 46, turned his hospital's chapel into an Ebola treatment center
time.com


PERSON OF THE YEAR
THE
EBOLA
FIGHTERS
Dr. Kent Brantly


PERSON OF THE YEAR
THE
EBOLA
FIGHTERS

ZIKA VIRUS

How Zika virus spread from Africa



Source: Lancaster University

BBC

Symptoms

- Only 20% have symptoms.
- Fever.
- Rash.
- Joint pain.
- Conjunctivitis (red eyes).
- Vaccine????
- Treatment????
- Prevention- prevent mosquito bites.

Transmission

- Mosquito bite- *Aedes aegypti.*
- Sexual transmission.
- Pregnancy-probably.
- Breastfeeding- no evidence of transmission.

Mosquito Bite Prevention

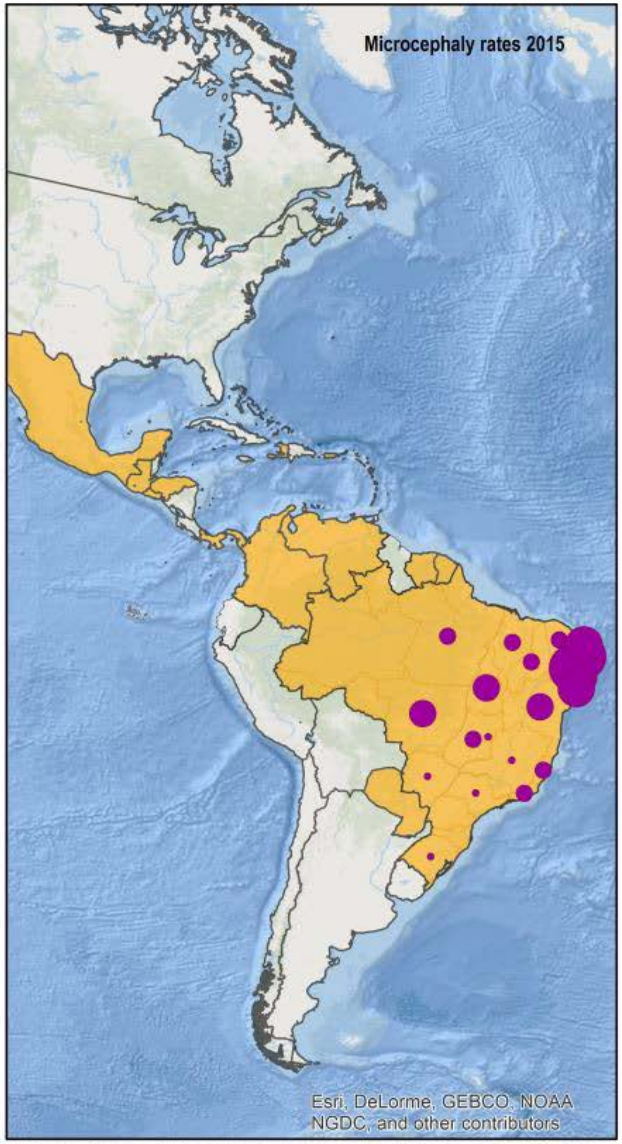
- Can prevent many illnesses- Dengue, West Nile, Chikungunya, Zika, malaria.
- Wear long-sleeved shirts and long pants.
- Sleep under a mosquito bed net if you are overseas or outside and are not able to protect yourself from mosquito bites.
- Use Environmental Protection Agency **(EPA)-**registered insect repellents. EPA-registered insect repellents are proven safe and effective, even for pregnant and breast-feeding women.
- Treat clothing and gear with permethrin or purchase permethrin-treated items.
  - http://www.epa.gov/insect-repellents/find-insect-repellent-right-you
  - Always follow the product label instructions
  - Reapply insect repellent as directed.
  - Do not spray repellent on the skin under clothing.
  - If you are also using sunscreen, apply sunscreen before applying insect repellent.
  - Do not use insect repellent on babies younger than 2 months of age.
  - Do not apply insect repellent onto a child's hands, eyes, mouth, and cut or irritated skin.
  - Adults: Spray insect repellent onto your hands and then apply to a child's face.

Complications

Countries and territories with confirmed cases of Zika virus (autochthonous transmission), 2014-2015 & Rates of microcephaly by state in Brazil, 2010-2014 and 2015

Pan American Health Organization

World Health Organization
Regional Office for the Americas



Updated as of Epidemiological Week 52
(December 27 - January 2, 2015)

Microcephaly rates by state in Brazil
(cases per 1,000 live births)

- 0.1 - 1.0
- 1.1 - 15.0
- 15.1 - 30.0
- 30.1 - 45.0
- 45.1 - 88.6
- Countries

Countries with Zika confirmed cases

- EW 52 2015
- Country limits
- Brazil state boundaries

Data Source:
Reported from the IHR National Focal Points and through the Ministry of Health websites.

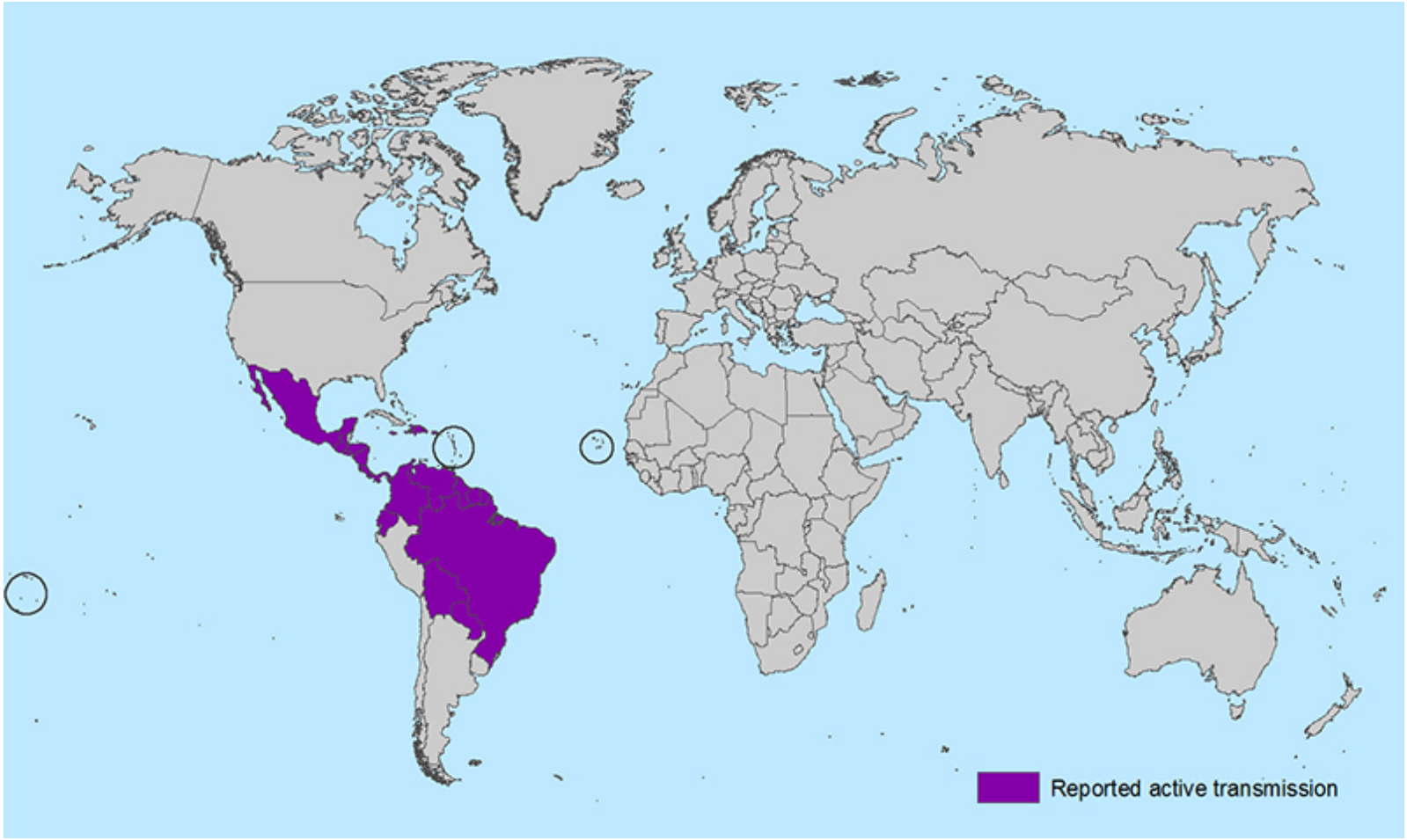
Map Production :
PAHO-WHO AD CHA IR ARO

0 1,000 2,000 4,000 Km

Microcephaly

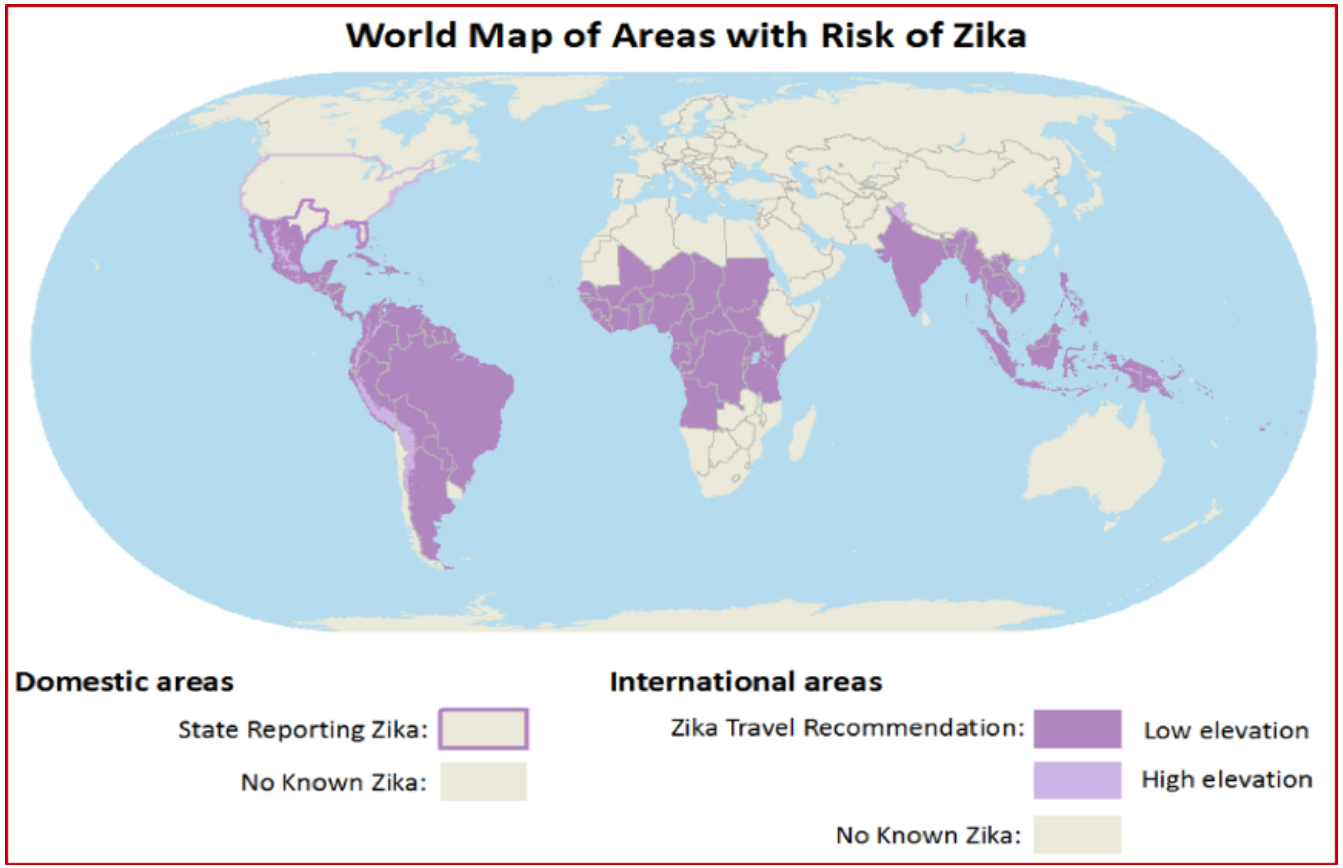
- Transmission during pregnancy- Zika was detected in the amniotic fluid of pregnant women. It was also detected in the brains of fetuses who died from microcephaly in Brasil.
- Guillain-Barre Syndrome.

Areas With Zika-2015



Source: CDC

Areas Affected by Zika- 2018



The Future of Zika?

Mosquitoes Within the US

Approximate distribution of *Aedes aegypti* in the United States*

Approximate distribution of *Aedes albopictus* in the United States*

Source: CDC

West Nile Virus

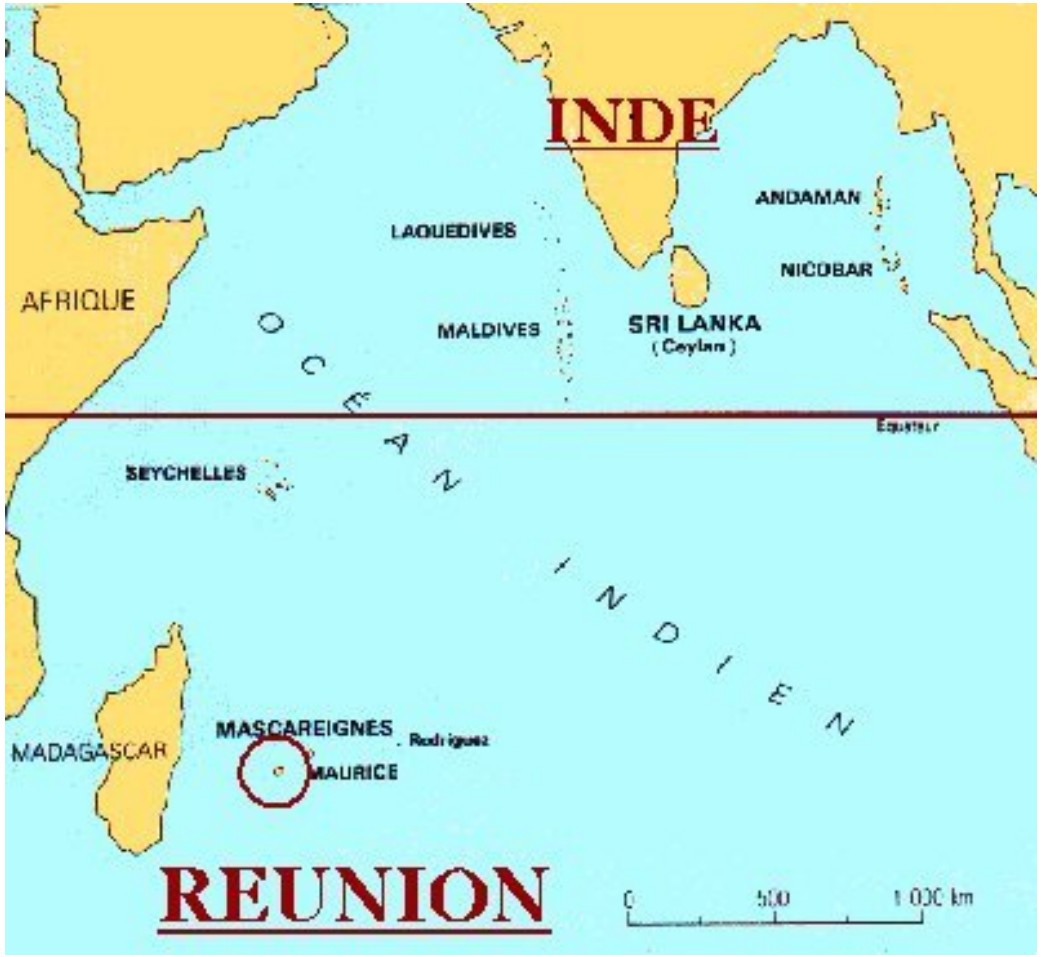
West Nile

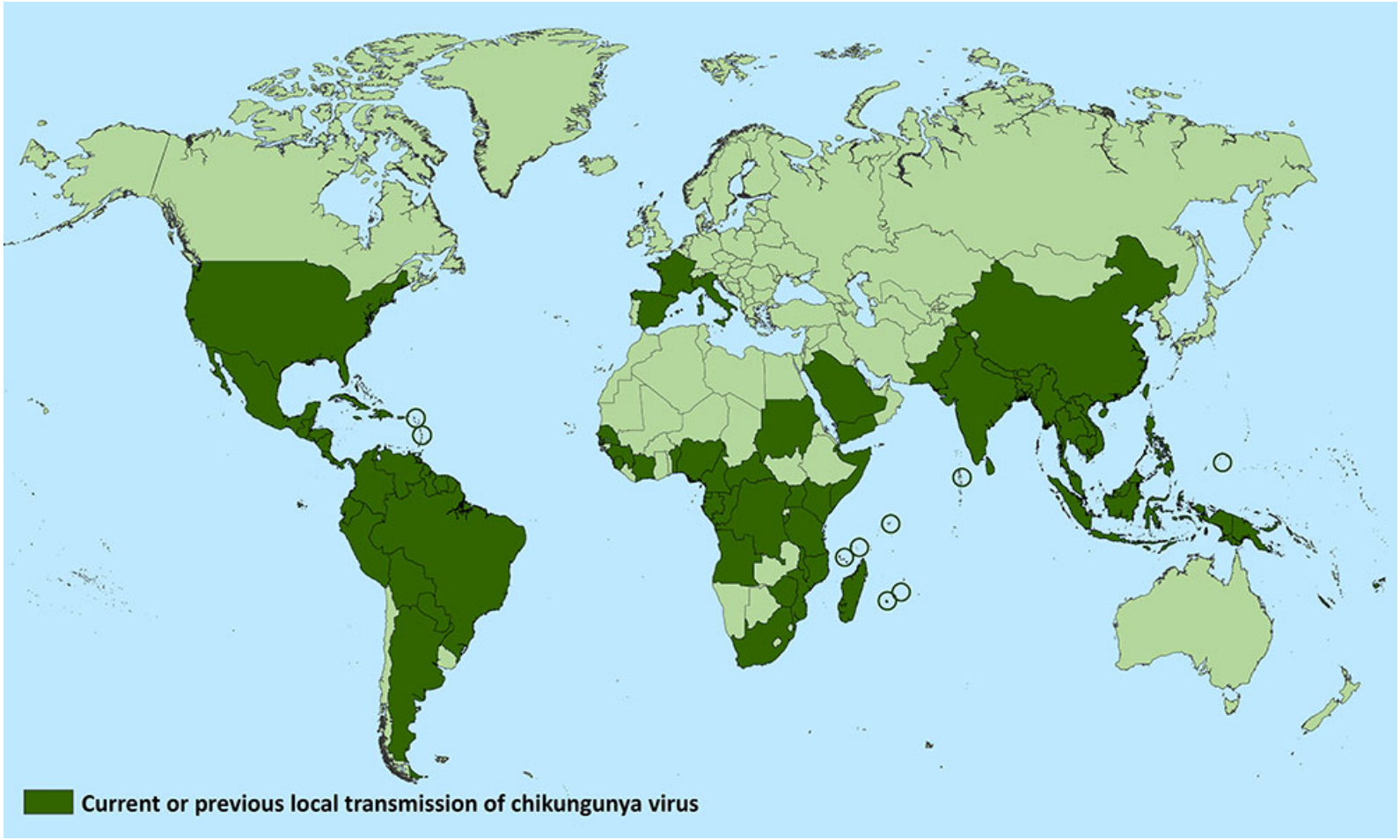
- 60-80% have no symptoms.
- 20-40%-fever, rash, fatigue, headaches.
- Transmitted through mosquito bites.
- Detected in all states.
- South Dakota: among the most affected.
- Incubation period: 2-14 days.
- 1% of people can get encephalitis, death.
- No treatment. No vaccine.
- Pesticides – are they harmful?

Further Prevention of WNV

- Remove all discarded tires on your property. Used tires have become an important source of mosquito breeding in the nation.
- Drill holes in the bottoms of recycling containers that are kept outdoors.
- Make sure roof gutters drain properly, and clean clogged gutters in the spring and fall.
- Turn over plastic wading pools and wheelbarrows when not in use.
- Change the water in birdbaths.
- Clean vegetation and debris from edges of ponds.
- Clean and chlorinate swimming pools, outdoor saunas and hot tubs.
- Drain water from pool covers.
- Use landscaping to eliminate standing water that collects on your property.

Chikungunya




Current or previous local transmission of chikungunya virus

Influenza


I DON'T KNOW WHO GAVE ME THE FLU
BUT I WILL FIND YOU AND KILL YOU
memegenerator.net

NIGHT EXTRA

The Seattle Daily Times

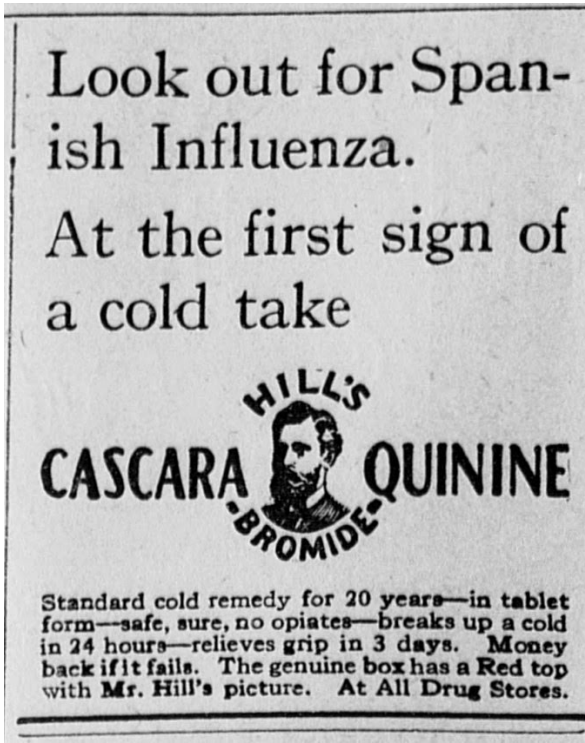
CHURCHES, SCHOOLS, SHOWS CLOSED

EPIDEMIC PUTS BAN ON ALL PUBLIC ASSEMBLIES

SEATTLE TO MAKE FIGHT ON DISEASE

AMERICANS AND FRENCH SMASH FOE

U.S. TROOPS SMASH HUNS IN ARGONNE



Look out for Spanish Influenza.

At the first sign of a cold take

HILL'S CASCARA BROMIDE QUININE

Standard cold remedy for 20 years—in tablet form—safe, sure, no opiates—breaks up a cold in 24 hours—relieves grip in 3 days. Money back if it fails. The genuine box has a Red top with Mr. Hill's picture. At All Drug Stores.

INFLUENZA

FREQUENTLY COMPLICATED WITH

PNEUMONIA

IS PREVALENT AT THIS TIME THROUGHOUT AMERICA.

THIS THEATRE IS CO-OPERATING WITH THE DEPARTMENT OF HEALTH

YOU MUST DO THE SAME

IF YOU HAVE A COLD AND ARE COUGHING AND SNEEZING- DO NOT ENTER THIS THEATRE

GO HOME AND GO TO BED UNTIL YOU ARE WELL

Coughing, Sneezing or Spitting Will Not Be Permitted In The Theatre. In case you must cough or Sneeze, do so in your own handkerchief, and if the Coughing or Sneezing Persists Leave The Theatre At Once.

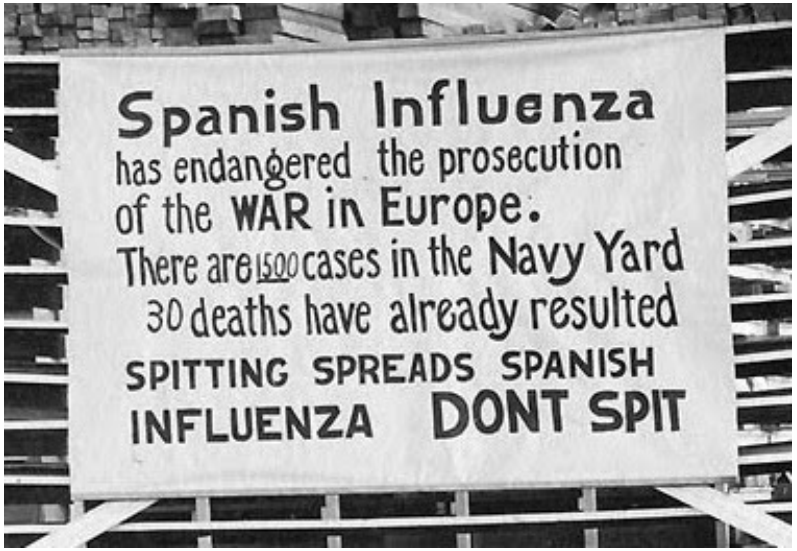
This Theatre has agreed to co-operate with the Department Of Health in disseminating the truth about Influenza, and thus serve a great educational purpose.

HELP US TO KEEP CHICAGO THE HEALTHIEST CITY IN THE WORLD

JOHN DILL ROBERTSON

COMMISSIONER OF HEALTH

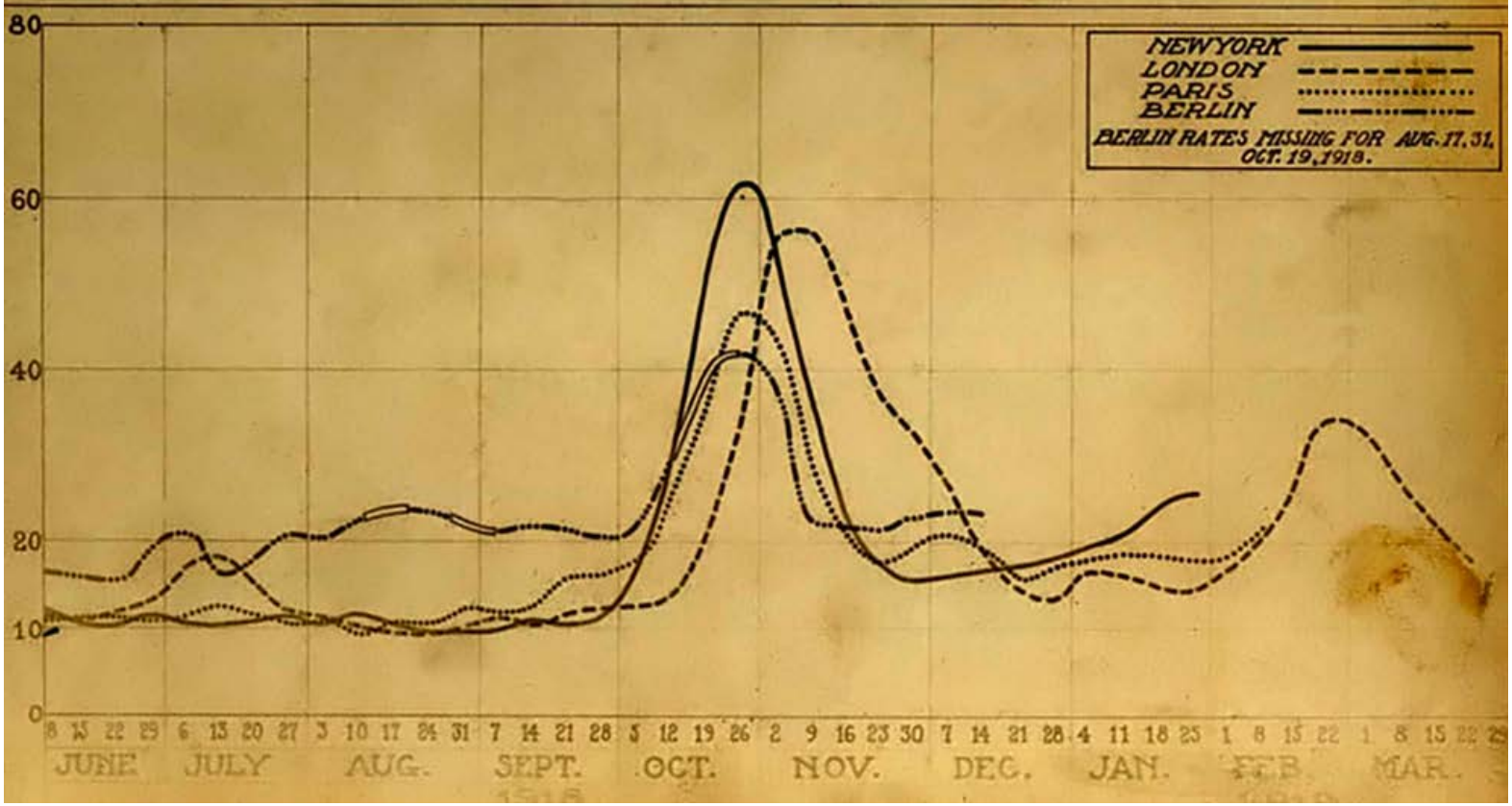
Sigue presentándose con carácter benigno. Faltan cementerios.



INFLUENZA PANDEMIC

MORTALITY IN AMERICA AND EUROPE DURING 1918 AND 1919

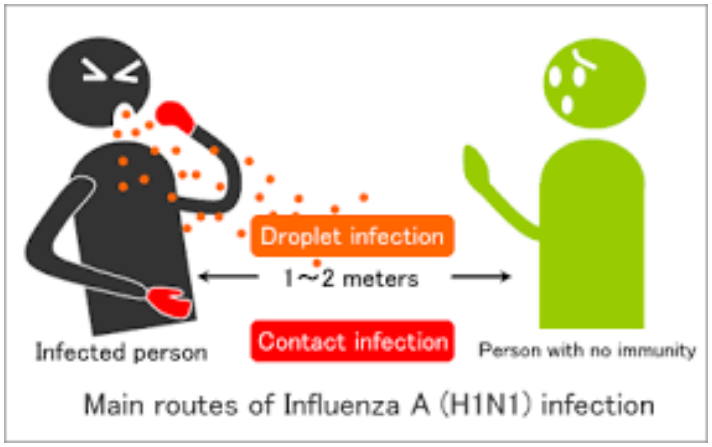
DEATHS FROM ALL CAUSES EACH WEEK
EXPRESSED AS AN ANNUAL RATE PER 1000



Clinical Symptoms

- Symptoms start 1-2 days after exposure.
- Body Aches, Joint pain.
- Fever (100-103), feeling too hot or too cold.
- Sneezing.
- Dry Cough.
- GI symptoms- uncommon(children >> adults).
- Secondary pneumonia.

Transmission



Main routes of Influenza A (H1N1) infection

You're contagious from one day BEFORE symptoms start until 5-7 days after their onset.

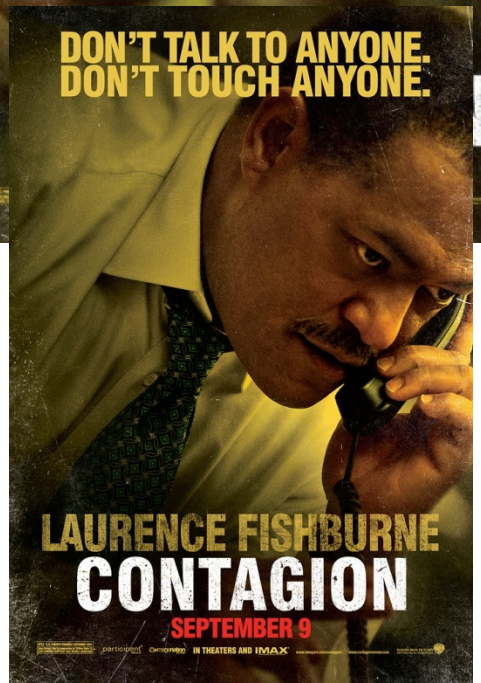
Transmission

- Traditionally, influenza viruses have been thought to spread from person to person primarily through large-particle respiratory droplet transmission (e.g., when an infected person coughs or sneezes near a susceptible person).
- Transmission via large-particle droplets requires close contact between source and recipient persons, because droplets generally travel only short distances (approximately 6 feet or less) through the air.
- Indirect contact transmission via hand transfer of influenza virus from virus-contaminated surfaces or objects to mucosal surfaces of the face (e.g., nose, mouth) may also occur.
- Airborne transmission over longer distances, such as from one patient room to another has not been documented and is thought not to occur.
- All respiratory secretions and bodily fluids, including diarrheal stools, of patients with influenza are considered to be potentially infectious; however, the risk may vary by strain.
- Detection of influenza virus in blood or stool in influenza infected patients is very uncommon.

Prevention


DON'T TALK TO ANYONE.
DON'T TOUCH ANYONE.
GWYNETH PALTROW
CONTAGION
SEPTEMBER 9
IN THEATERS AND IMAX


DON'T TALK TO ANYONE.
DON'T TOUCH ANYONE.


DON'T TALK TO ANYONE.
DON'T TOUCH ANYONE.
LAURENCE FISHBURNE
CONTAGION
SEPTEMBER 9
IN THEATERS AND IMAX


DON'T TALK TO ANYONE.
DON'T TOUCH ANYONE.
JUDE LAW
CONTAGION
SEPTEMBER 9
IN THEATERS AND IMAX

Fundamental Elements to Prevent Influenza Transmission

- Administration of influenza vaccine
- Implementation of respiratory hygiene and cough etiquette.
- Appropriate management of ill HCP (Health-Care Personnel)
- Adherence to infection control precautions for all patient-care activities and aerosol-generating procedures.
- Implementing environmental and engineering infection control measures.
- Successful implementation of many, if not all, of these strategies is dependent on the presence of clear administrative policies and organizational leadership that promote and facilitate adherence to these recommendations among the various people within the healthcare setting, including patients, visitors, and HCP.

During periods of increased influenza activity…

- Minimize elective visits by patients with suspected or confirmed influenza (minimize visits by patients seeking care for mild influenza-like illness).

- Take steps to ensure all persons with symptoms of a respiratory infection adhere to respiratory hygiene, cough etiquette, hand hygiene, and triage procedures throughout the duration of the visit. These include:
  - Posting visual alerts (e.g., signs, posters) at the entrance and in strategic places (e.g., waiting areas, elevators, cafeterias) to provide patients and HCP with instructions about respiratory hygiene and cough etiquette, especially during the influenza season. Instructions should include:
    - How to use facemasks or tissues to cover nose and mouth when coughing or sneezing and to dispose of contaminated items in waste receptacles.
    - How and when to perform hand hygiene.
  - Implementing procedures during patient registration that facilitate adherence to appropriate precautions (e.g., at the time of patient check-in, inquire about presence of symptoms of a respiratory infection, and if present, provide instructions).

- Provide facemasks to patients with signs and symptoms of respiratory infection.
- Provide supplies to perform hand hygiene to all patients upon arrival to facility (e.g., at entrances of facility, waiting rooms, at patient check-in) and throughout the entire duration of the visit to the healthcare setting.
- During periods of increased community influenza activity, facilities should consider setting up triage stations that facilitate rapid screening of patients for symptoms of influenza and separation from other patients.

Ill Healthcare Personnel

HCP who develop fever and respiratory symptoms should be:

- Instructed not to report to work, or if at work, to stop patient-care activities, don a facemask, and promptly notify their supervisor and infection control personnel/occupational health before leaving work.
- Reminded that adherence to respiratory hygiene and cough etiquette after returning to work is always important. If symptoms such as cough and sneezing are still present, HCP should wear a facemask during patient-care activities. Also, reinforce hand hygiene.
- Excluded from work until at least 24 hours after they no longer have a fever (without the use of fever-reducing medicines such as acetaminophen). Those with ongoing respiratory symptoms should be considered for evaluation by occupational health to determine appropriateness of contact with patients.

Prevention

Gloves

- Wear gloves for any contact with potentially infectious material. Remove gloves after contact, followed by hand hygiene. Do not wear the same pair of gloves for care of more than one patient.

Gowns

- Wear gowns for any patient-care activity when contact with blood, body fluids, secretions (including respiratory), or excretions is anticipated. Remove gown and perform hand hygiene before leaving the patient's environment. Do not wear the same gown for care of more than one patient.

Droplet Precautions

- Droplet precautions should be implemented for patients with suspected or confirmed influenza for 7 days after illness onset or until 24 hours after the resolution of fever and respiratory symptoms, whichever is longer, while a patient is in a healthcare facility.
- Facilities may choose to apply droplet precautions for longer periods based on clinical judgment, such as in the case of young children or severely immunocompromised patients.
- Place patients with suspected or confirmed influenza in a private room or area.
- HCP should don a facemask when entering the room of a patient with suspected or confirmed influenza.
- If a patient under droplet precautions requires movement or transport outside of the room:
  - Have the patient wear a facemask, if possible, and follow respiratory hygiene and cough etiquette and hand hygiene.
  - Communicate information about patients with suspected, probable, or confirmed influenza to appropriate personnel before transferring them to other departments in the facility (e.g., radiology, laboratory) or to other facilities.
- Patients under droplet precautions should be discharged from medical care when clinically appropriate, not based on the period of potential virus shedding or recommended duration of droplet precautions.

Anti-virals

- **Oseltamivir** (available as a generic or under the trade name Tamiflu®) is FDA-approved for treatment of influenza in people aged two weeks and older, and for chemoprophylaxis to prevent influenza in people one year of age and older. Generic oseltamivir was approved by the FDA in August 2016 and became available in December 2016.
- **Zanamivir** (trade name Relenza®) is FDA-approved to treat influenza in people 7 years and older and to prevent influenza in people 5 years and older. It is not recommended for use in people with underlying respiratory disease, including people with asthma.
- **Peramivir** (trade name Rapivab®) is FDA-approved to treat flu in people 2 years and older.

INFLUENZA MASK WEARING COMPULSORY, HEALTH BOARD

City Schools Closed Following Outbreak of Epidemic. Dr. James B. Bullitt Placed in Charge of Fight Against the Disease.

In accordance with the ordinance passed by the city council on October 28, which is in full force and effect at present, and in compliance with a resolution passed by the board of health at a meeting this evening that necessity now exists for wearing influenza masks, the order is hereby issued that all persons in the city of San Jose appearing on public streets, in any public place, or any assemblage of persons, or in any place where two or more persons are congregated, shall wear influenza masks of not less than four ply gauze

JAMES B. BULLITT, M. D.,
Acting Health Officer

I hereby appoint Dr. James B. Bullitt acting health officer for the city of San Jose, to serve until this appointment is revoked

W. C. BAILEY,
City Manager.

Beginning this morning masks must be worn again in San Jose. The order was issued last night to become effective this morning by Dr. James B. Bullitt immediately following his appointment as acting health officer by Dr. W. C. Bailey, city manager.

The order appointing Dr. Bullitt

cases have been diagnosed by physicians of the city as influenza. Ten cases are reported from the normal school, three cases are reported from the Y. W. C. A. and 25 cases are reported from Notre Dame. One death occurred during the day that of Lucy Bugletary.

That the epidemic has reached widespread throughout the city was indicated last night by Dr. Bailey who said that there are cases in about 150 families.

Dr. M. L. Hailey president of the state normal has opened an emergency hospital for patients from his institution in a house on Twelfth street where the young women are being given the best of care.

The county authorities will be called upon by District Attorney Arthur M. Free to take cognizance of the epidemic and take such action as under the law they may have the right in order to safeguard the public. Mr. Free stated to the Mercury Herald last night that he would take the matter up with the county supervisors today and very likely would ask that a special meeting be called to consider the situation.

Influenza is rampant, said Mr. Free, and we must act immediately.

Four members of Mr. Free's family, his wife and three children are suffering from influenza and he found that there is already a short-

REFUSES TO DON INFLUENZA MASK; SHOT BY OFFICER

SAN FRANCISCO, Oct. 28.—While scores of passersby scurried for cover, H. D. Miller, a deputy health officer, shot and severely wounded James Wisser, a horseshoer, in front of a downtown drug store early today, following Wisser's refusal to don an influenza mask.

Accocrding to the police, Miller shot in the air when Wisser first refused his request. Wisser closed in on him and in the succeeding affray was shot in the arm and the leg.

Wisser was taken to the central emergency hospital, where he was placed under arrest for failure to comply with Miller's order.

The Influenza Vaccine

- It's not possible to predict with certainty which flu viruses will predominate during a given season, therefore there’s almost never a 100% match between the vaccine and the circulating virus.
- “I took the flu shot and it gave me the flu”.
- Flu shot versus nasal shot?
- Egg allergy??

Influenza Vaccines

- For the 2017–18 season. Trivalent (IIV3) , Quadrivalent (IIV4) formulations. Recombinant influenza vaccine (RIV) will be available in trivalent (RIV3) and quadrivalent (RIV4) formulations.
- Live attenuated influenza vaccine (LAIV4) is not recommended for use during the 2017–18 season due to concerns about its effectiveness against (H1N1) during the 2013–14 and 2015–16 seasons.
- Trivalnet vaccines : H1N1, H3N2, and one lineage of B.
- Quadrivalent: trivalent plus another lineage of B.
- Pregnant women may receive any licensed, recommended, age-appropriate influenza vaccine.

Egg Allergy

- Persons with a history of egg allergy who have experienced only urticaria (hives) after exposure to egg should receive influenza vaccine with any licensed and recommended influenza vaccine.
- Persons who report having had reactions to egg involving symptoms other than urticaria (hives), such as angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required epinephrine or another emergency medical intervention, may similarly receive any licensed and recommended influenza vaccine administered in an inpatient or outpatient medical setting (including, but not necessarily limited to, hospitals, clinics, health departments, and physician offices). Vaccine administration should be supervised by a health care provider who is able to recognize and manage severe allergic conditions.
- A previous severe allergic reaction to influenza vaccine, regardless of the component suspected of being responsible for the reaction, is a contraindication to future receipt of the vaccine.

The Common Cold

- Over 100 viruses cause the common cold.
- Why do they occur more during the winter?
- Why can't we cure the common cold?
- Soooooo many strains of each virus, for example, there are 20-30 strains of the rhinovirus alone.
- Most people recover completely , within 7-10 days.
- Huge market – 1 billion colds a year.

RSV

- Affects people of all ages.
- Transmission is by inoculation of nasopharyngeal or ocular mucous membranes after contact with virus-containing secretions or fomites. Direct contact is the most common route of transmission. The average duration of shedding is approximately 10 days.
- RSV is highly contagious and can cause serious health care-associated infections especially in patients with congenital heart or lung disease, bone marrow and lung transplant recipients, and the frail older adults with multiple underlying conditions.
- Hand washing, and appropriate use of gloves are probably the most important infection control measures, but contact precautions, including surgical mask, eye protection, and disposable gowns for health care providers, should be used when there is a chance of exposure to aerosols of infectious respiratory secretions .
- Isolation of patients in private rooms or in rooms with other RSV-infected patients (cohorting patients) and limited transport of patients from their rooms also are recommended.
- No vaccine.

The Cow-Pock — or — *the Wonderful Effects of the New Inoculation!* — Vide. the Publications of y^e Anti-Vaccine Society.

Pub.^d June 16.^th 1802. by H. Humphrey St.^t James's Street.

HIV

Human Immunodeficinecy Virus

Acute HIV Infection

- The symptoms that occur following infection with HIV are collectively called the antiretroviral syndrome.
- The incubation period is 2-4 weeks.
- 10-60% of infected individuals remain asymptomatic.
- Given the wide range of symptoms associated with acute HIV infection, clinicians should have a low threshold to suspect it.

Time to positivity of HIV diagnostic tests

Test	Target of detection	Approximate time to positivity (days)
Enzyme-linked immunoassay		
First generation	IgG antibody	35 to 45
Second generation	IgG antibody	25 to 35
Third generation	IgM and IgG antibody	20 to 30
Fourth generation	IgM and IgG antibody and p24 antigen	15 to 20
Western blot		
	IgM and IgG antibody	35 to 50 (indeterminate)
		45 to 60 (positive)
HIV viral load test		
Sensitivity cutoff 50 copies/mL	RNA	10 to 15
Ultrasensitive cutoff 1 to 5 copies/mL	RNA	5

This table demonstrates the approximate time to positivity following infection for various diagnostic tests for HIV.

IgG: immunoglobulin G; IgM: immunoglobulin M.

References:

1. *Branson BM, Stekler JD. Detection of acute HIV infection: We can't close the window. J Infect Dis 2012; 205:521.*
2. *Owen SM. Testing for acute HIV infection: implications for treatment as prevention. Curr Opin HIV AIDS 2012; 7:125.*
3. *Cohen MS, Gay CL, Busch MP, et al. The detection of acute HIV infection. J Infect Dis 2010; 202:S270.*

Pre-exposure prophylaxis (PrEP)

- Pre-exposure prophylaxis (or PrEP) is when people at very high risk for HIV take HIV medicines daily to lower their chances of getting infected.
- It is highly effective for preventing HIV if used as prescribed but much less effective when not taken consistently.
- Daily PrEP reduces the risk of getting HIV from sex by more than 90%. Among people who inject drugs, it reduces the risk by more than 70%.
- PrEP can be considered for all serodiscordant patients, however there is a very low likelihood of transmission if the HIV-infected partner is adherent to their ART regimen and is confirmed to have a stably suppressed plasma HIV RNA.
- Medication adherence is essential.
- There is a risk of drug resistance.

Post-Exposure Prophylaxis (PEP) for Health-Care Professionals

Health-Care Exposure

- The initial response to any exposure to blood should be immediate cleansing of the exposed site.
- For skin exposures, the area should be washed with soap and water. Small wounds and punctures may be cleansed with an antiseptic such as an alcohol-based hand hygiene agent, since alcohol is virucidal to HIV, hepatitis B virus (HBV), and hepatitis C virus (HCV). Other antiseptics such as chloroxylenol (PCMX) and chlorhexidine (CHG) also inactivate HIV.
- For mucosal surface exposure, the exposed mucus membranes should be flushed with copious amounts of water. Eyes should be irrigated with saline or water.
- Documentation of the exposure— this includes risk factors and serologic tests for HIV, hepatitis B and C.

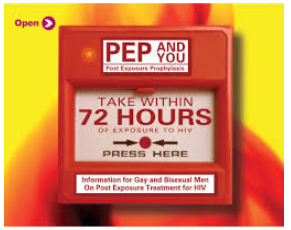
Definition of exposure:

- A percutaneous injury (eg, a needlestick or cut with a sharp object)
- Contact of mucous membrane or non-intact skin (eg, exposed skin that is chapped, abraded, or afflicted with dermatitis)

PEP

- **Body fluids of concern include:**
- Body fluids implicated in the transmission of HIV: blood, semen, vaginal secretions, other body fluids contaminated with visible blood.
- Potentially infectious body fluids (undetermined risk for transmitting HIV): cerebrospinal, synovial, pleural, peritoneal, pericardial, and amniotic fluids.
- Fluids that are **not** considered infectious unless they contain blood include feces, nasal secretions, saliva, gastric secretions, sputum, sweat, tears, urine, and/or vomitus.
- **Intact skin is an effective barrier against HIV infection**, and contamination of intact skin with blood or other potentially contaminated fluids is not considered an exposure and does not require PEP.

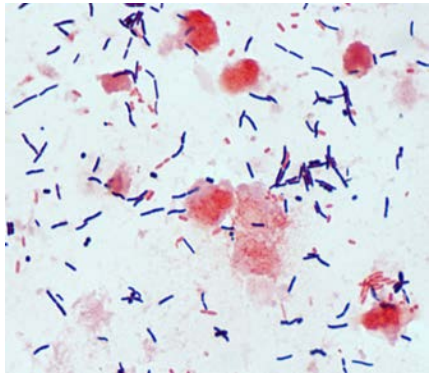
- HCP should be informed of the risk associated with the specific exposure experienced.
- With percutaneous or sharps injuries from an HIV-infected source, the risk of HIV infection averages 3/1000, but varies depending on the inoculum size (source viral load and volume of blood), the depth of penetration, and exposure to a hollow bore versus suture needle.
- The HCP may also be at risk for other bloodborne pathogens, such as hepatitis B or C.
- The HCP should be advised to practice safe sex or abstain until serologic testing in the source is reported negative.
- The efficacy and disadvantages of PEP should be discussed.
- PEP does not assure complete prevention of HIV infection.
- The goal is to initiate PEP within one to two hours of exposure; the benefit of PEP is diminished with each hour delay in initiation. PEP is typically not recommended after a delay of more than 72 hours.
- Usually, 2-3 drugs are given for a period of 28 days.



Clostridium Difficile Infections (CDI)

Microbiology and Pathogenesis

- Clostridium difficile is an anaerobic gram-positive, toxin-producing bacillus
- Exists in spore and vegetative forms. Outside the colon, it survives in spore form that is resistant to heat, acid and antibiotics.
- Once spores are in the colon, they convert to their fully functional vegetative, toxin-producing forms and become susceptible to killing by antimicrobial agents.
- *Photo Credit: Schimat/Science Photo Library*



The Fecal Cloud

- A study compared air samples in the space adjacent to patients with confirmed *C. difficile* diarrhea with control patients without infection.
- In 10 patients with symptomatic infection, 70% had at least one air sample positive for *C. difficile*, and 90% had positive environmental samples from surrounding surfaces.
- *C. difficile* was most commonly recovered from air samples obtained at times of activity in the vicinity of patients.
- The authors conclude that aerosolization of *C. difficile* does occur.
- These findings support isolation of infected patients as soon as possible after onset of diarrhea as a means of controlling dissemination of *C. difficile*.
- ***Best EL, Fawley WN, Parnell P, et al: The potential for airborne dispersal of Clostridium difficile from symptomatic patients. . Clin Infect Dis 2010; 50(11):1450-1457.***

INFECTION PREVENTION AND CONTROL

- Accommodate patients with CDI in a private room with a dedicated toilet to decrease transmission to other patients. If there is a limited number of private single rooms, prioritize patients with stool incontinence for placement in private rooms.
- If cohorting is required, do not cohort patients with CDI who are discordant for other multidrug-resistant organisms such as MRSA or VRE.
- Healthcare personnel must use gloves and gowns. After caring for patients with CDI, the proportion of healthcare personnel with hand contamination when gloves are not worn ranges from 14% to 59%.

- **XVI. How long should isolation be continued?**
- Continue contact precautions for at least 48 hours after diarrhea has resolved.
- Prolong contact precautions until discharge if CDI rates remain high despite implementation of standard infection control measures against CDI.
- **XVII. What is the recommended hand hygiene method (assuming glove use) when caring for patients in isolation for CDI?**
- In CDI outbreaks or hyperendemic (sustained high rates) settings, perform hand hygiene with soap and water preferentially instead of alcohol-based hand hygiene products before and after caring for a patient with CDI given the increased efficacy of spore removal with soap and water.
- Handwashing with soap and water is preferred if there is direct contact with feces or an area where fecal contamination is likely (eg, the perineal region).
- Use disposable patient equipment when possible and ensure that reusable equipment is thoroughly cleaned and disinfected.

- **XXIV. Should asymptomatic carriers of *C. difficile* be identified and isolated if positive?**
- There are insufficient data to recommend screening for asymptomatic carriage and placing asymptomatic carriers on contact precautions.
- **XXVII. What is the role of probiotics in primary prevention of CDI?**
- There are insufficient data at this time to recommend administration of probiotics for primary prevention of CDI outside of clinical trials.

Management

- Metronidazole- not recommneded per guidelines.
- PO vancomycin.
- Vancomycin enema.
- Fidaxomicin (Dificid).
- Stool transplantation.
- No need for routine stool re-check.
- Don’t test asymptomatic patients.


Fecal Microbiota
Ingredients: Human feces filtered to
(0.9%), Glycerol (12.5%), Water.
Fecal Microbiota
Ingredients: Human feces filtered to

Thank you