



Emerging Diseases: Global Health is Our Health

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Health & Human Services

Objectives

- Participants will be able to name at least three emerging disease that have or could impact North Dakota or the United States (US).
- Participants will learn what emerging diseases are and why they are a threat to human health.
- Participants will learn when and how to notify public health when they suspect an emerging issue.

What are Emerging Diseases?



Emerging diseases are infections that have increased recently or are threatening to increase in the near future.



Can be caused by bacteria, viruses, or fungi

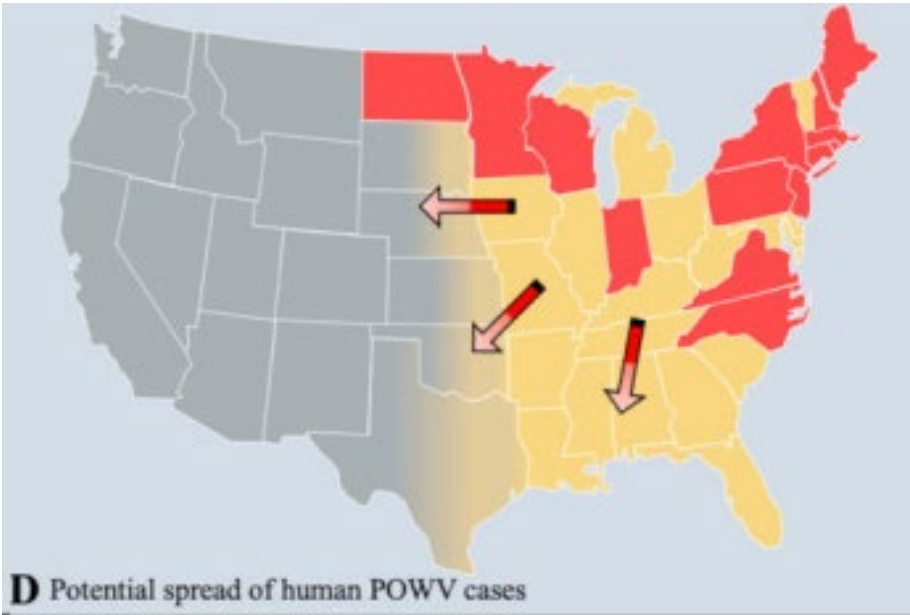
What are Emerging Diseases?

- Diseases that **reappear** in an area
- Diseases that **newly appear in an area**
- Completely **new diseases**
- Diseases that have become **resistant to antibiotics.**

Diseases Newly Discovered

- This happens when diseases are first identified or discovered to infect people.
 - Bourbon virus
 - Heartland virus
 - Powassan virus
 - Mpox
 - Novel Influenza

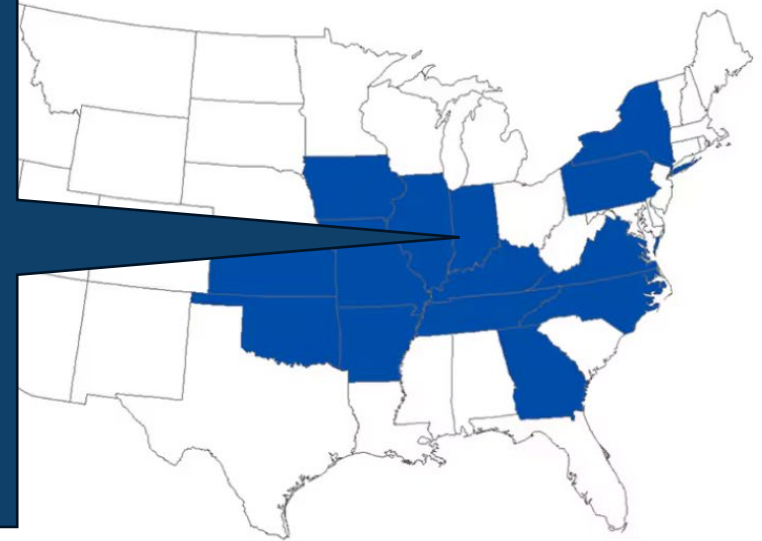




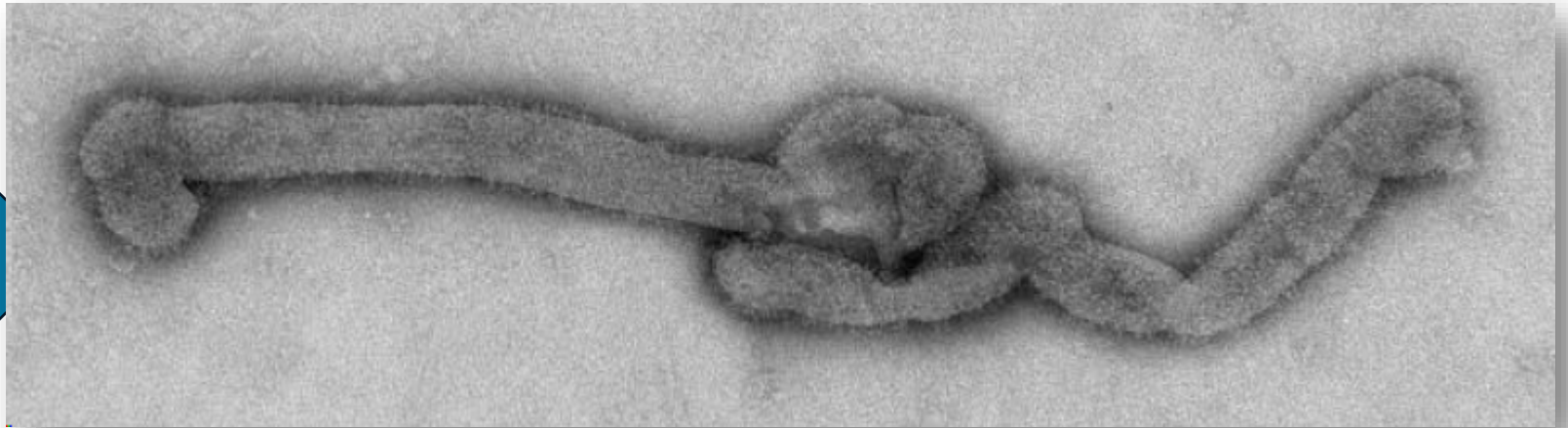
D Potential spread of human POWV cases

Powassan Map: Hassett EM, Thangamani S. Ecology of Powassan Virus in the United States. *Microorganisms*. 2021 Nov 9;9(11):2317. doi: 10.3390/microorganisms9112317. PMID: 34835443; PMCID: PMC8624383.

Heartland virus is spread to people by the bite of an infected tick. Most cases have been reported from states in the Midwestern and Southern United States.



Bourbon virus is believed to be spread through the bite of an infected tick. The virus was discovered in 2014 and named for Bourbon County, Kansas where it was first identified.



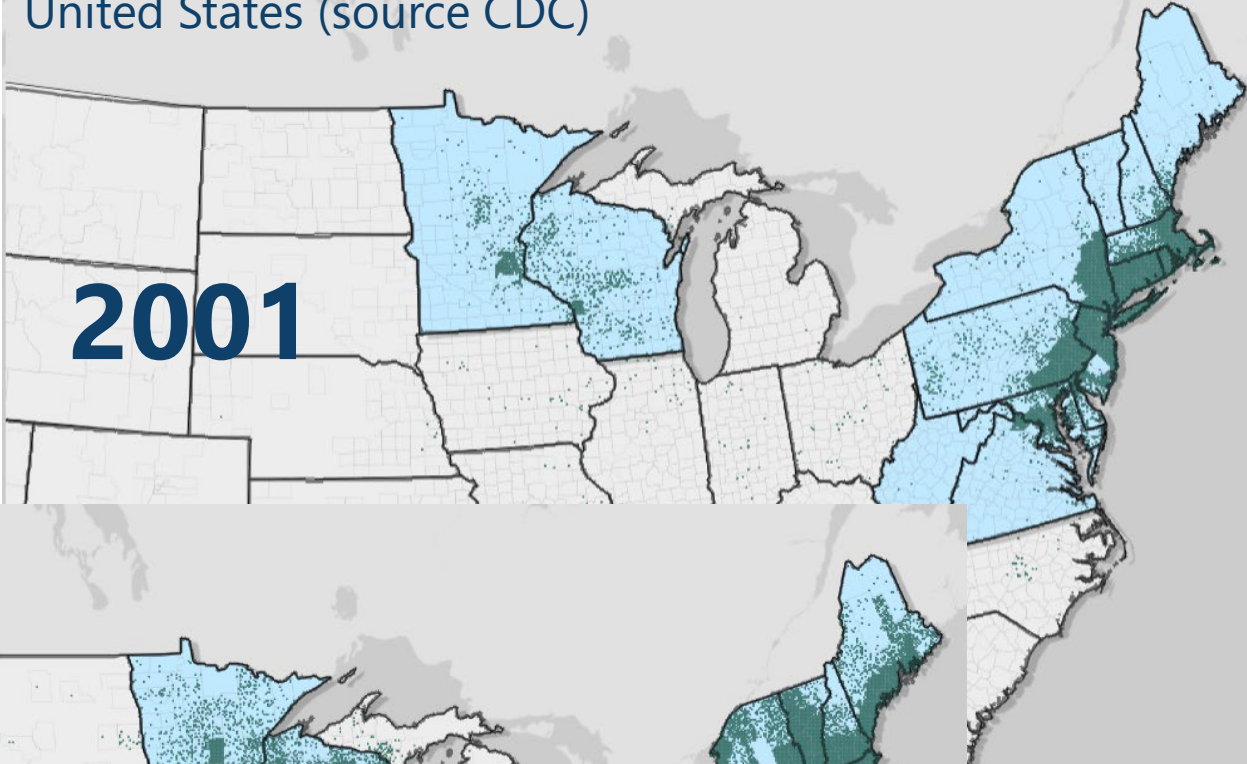


Diseases New to an Area

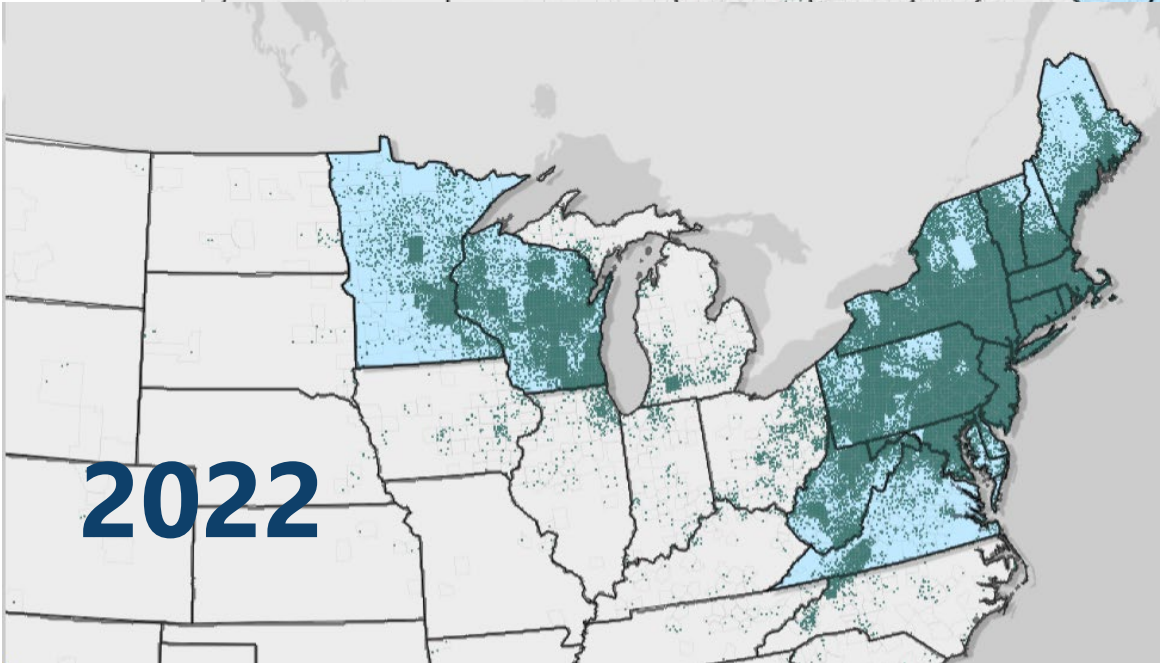
- This happens when diseases spread to other areas where is traditionally is not found.
 - Zika virus
 - Ebola virus
 - Melioidosis
 - MERS
 - Lyme Disease

Lyme Disease Cases by State of Residence – United States (source CDC)

2001



2022



Facts *about*
Ebola
in the U.S.

You **CAN'T** get Ebola through **AIR**



You **CAN'T** get Ebola through **WATER**

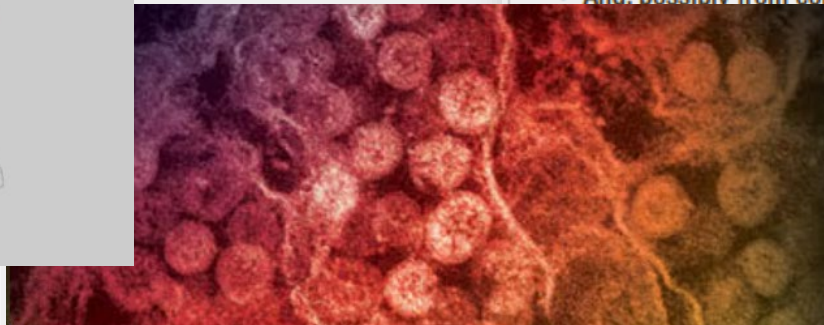


You **CAN'T** get Ebola through **FOOD** grown or legally purchased in the U.S.



You can only get Ebola from

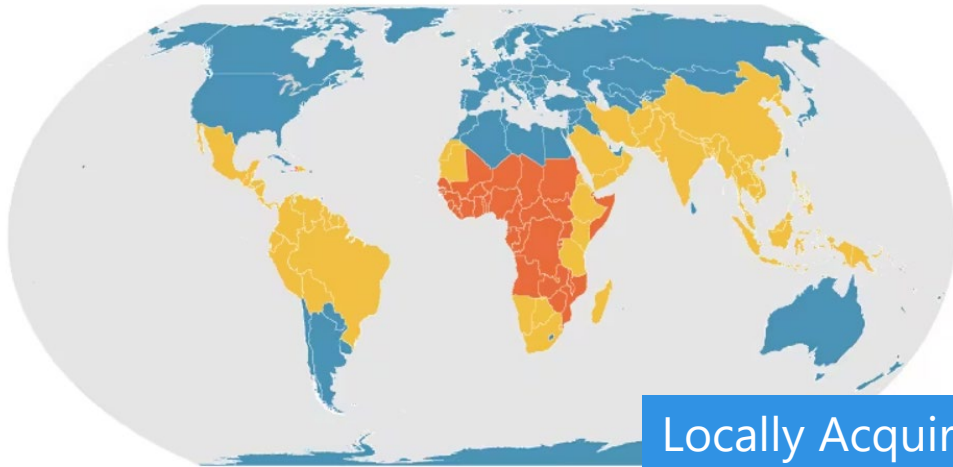
- The body fluids of a person who is sick with or has died from Ebola.
- Objects contaminated with body fluids of a person sick with Ebola or who has died of Ebola.
- Infected fruit bats and primates (apes and monkeys).
- And, possibly from contact with semen from a man with Ebola (for example, by anal sex).



Disease Reemergence

- This happens when diseases that have been gone from an area (non-endemic) show up again and cause infection.
 - Dengue
 - Malaria
 - Measles

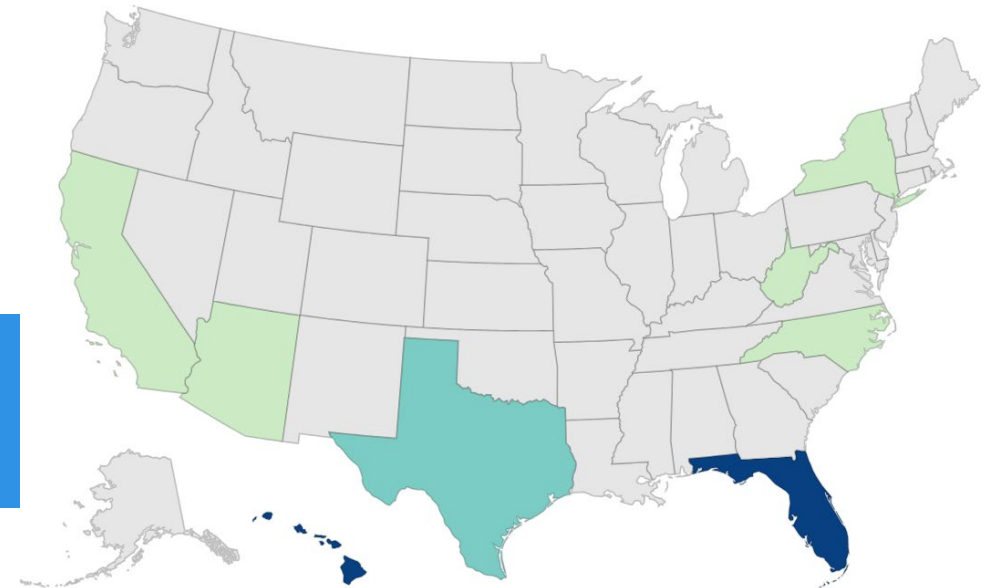




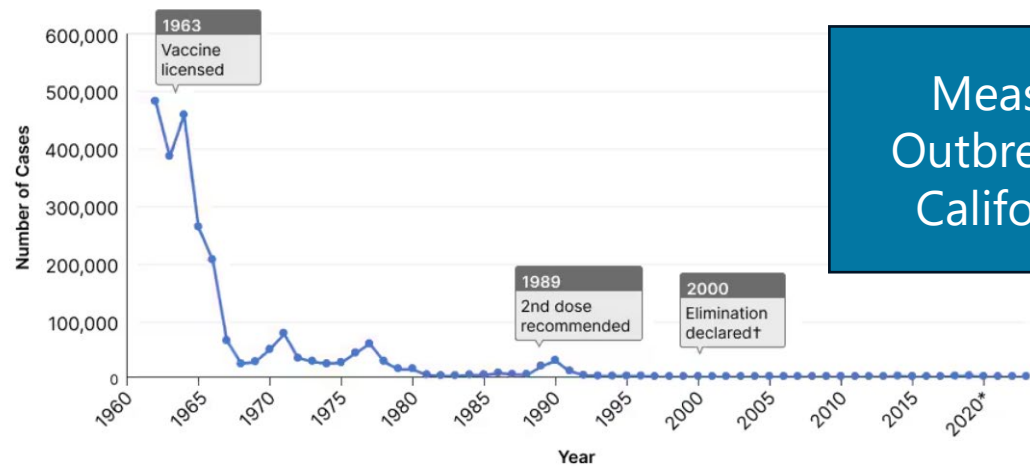
■ Malaria transmission is not known to occur in some places
■ Malaria transmission occurs in some places throughout the year
■ Malaria transmission occurs throughout the year

Locally Acquired Cases of Malaria in Florida, Texas, Maryland, and Arkansas in 2023!

Locally acquired dengue cases by jurisdiction of residence in US states and territories, 2010 - 2023



Reported Measles Cases in the United States from 1962 – 2023*



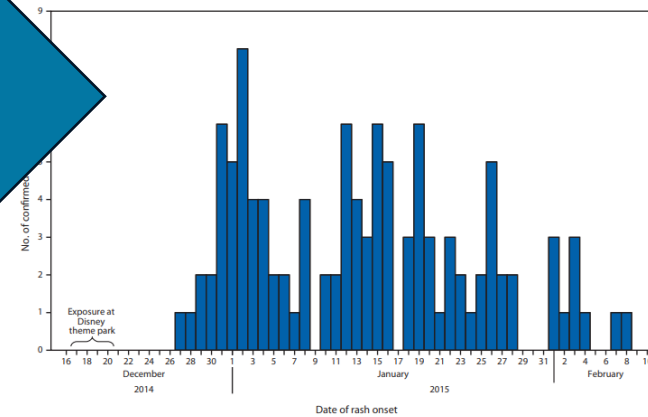
Measles Outbreak in California

*2023 data are preliminary and subject to change.

†Elimination is defined as the absence of endemic measles transmission in a region for ≥ 12 months in the presence of a well-performing surveillance system.

Morbidity and Mortality Weekly Report

FIGURE. Number of confirmed measles cases (N = 110),* by date of rash onset — California, December 2014–February 2015



* Reported to the California Department of Public Health as of February 11, 2015.

Dengue in Florida, Texas and Hawaii

Antimicrobial Resistance

- Antimicrobial resistance happens when bacteria and fungi develop the ability to defeat the drugs designed to destroy them.
- Resistant infections can be difficult and sometimes impossible to treat.
- This is an urgent global threat. In the US each year:
 - More than 2.8 million antimicrobial-resistant infections occur
 - More than 35,000 people die

Where Antimicrobial Resistance Spreads



Water, Soil
and Food
Supply



Healthcare
Facilities

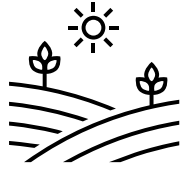


Your
Community

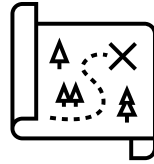


Around the
World

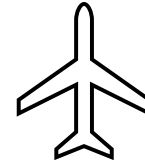
How Does this Happen and How Do Emerging Diseases Spread?



As the climate changes, the risk also increases for health threats



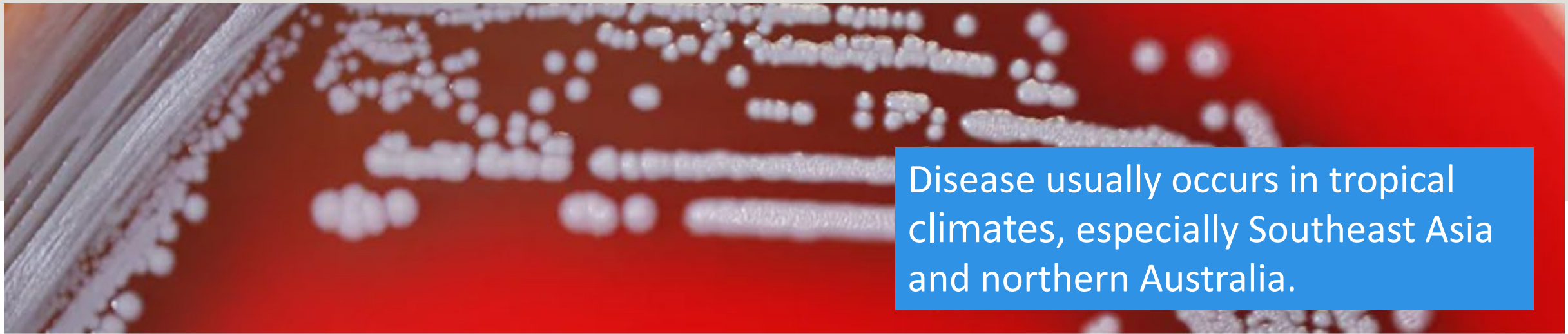
Increased interactions between people, animals, and environment



Increased opportunities for travel



Better detection and diagnostic capabilities



Disease usually occurs in tropical climates, especially Southeast Asia and northern Australia.

Melioidosis is caused by infection with the bacteria *Burkholderia pseudomallei*.

2021 Contaminated Aromatherapy Spray

- Four non-traveler cases in four different states
- Product was imported from a melioidosis-endemic area
- Before 2022, cases in the US were among people who traveled outside the US

2022 Soil and Water along the Mississippi Gulf Coast

- *Burkholderia pseudomallei* detected for the first time in continental United States while scientists investigated two human cases.
- Climatic factors such as rising temperatures and precipitation could be making environmental conditions more favorable

One billion people cross through international borders each year. This includes 350 million travelers arriving in the United States through more than 300 points of entry.

- *Candida auris*
- *Clostridioides difficile*
- Carbapenem-resistant *Acinetobacter*
- Drug-resistant Tuberculosis
- Drug-resistant *Streptococcus pneumoniae*

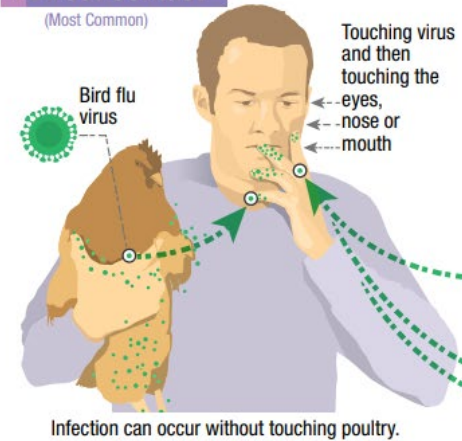
A resistant threat anywhere can quickly become a threat at home.
Global capacity is needed to slow development and prevent spread of antibiotic resistance.

Highly Pathogenic Avian Influenza

H5N1 bird flu is widespread in wild birds worldwide and is causing outbreaks in poultry and U.S. dairy cows with one recent human case in a U.S. dairy worker.

How Infected Backyard Poultry Could Spread Bird Flu to People Human Infections with Bird Flu Viruses Rare But Possible

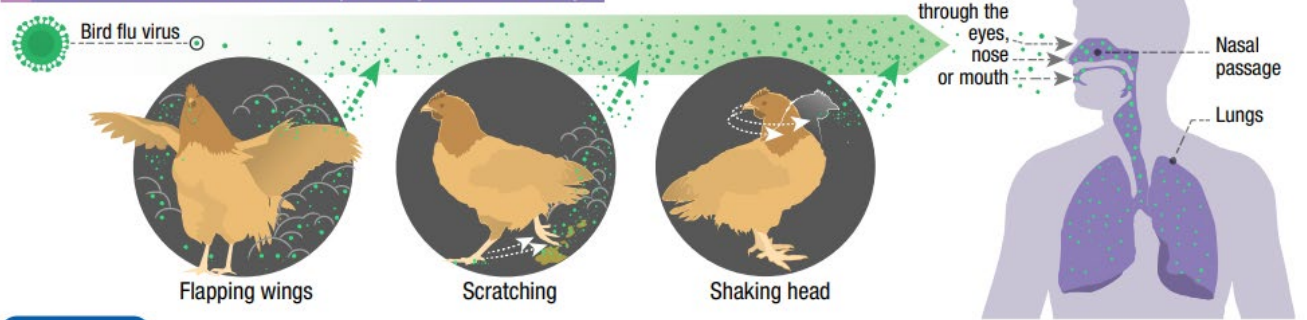
1 Direct Contact (Most Common)



2 Contaminated Surfaces



3 Bird Flu Virus in the Air (in Droplets or Dust)



www.cdc.gov/flu/avianflu/avian-in-humans.htm

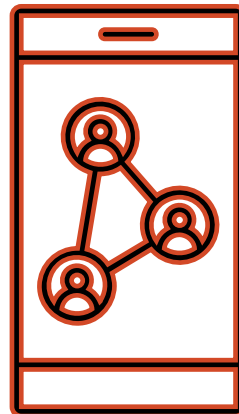
CS330154

Early Recognition and Detection is Key

- Information such as potential risk factors for emerging diseases that include travel history and exposure history are important.
- Keep current on public health alerts and travel health notices
 - **Health Alert Network (HAN)** - <https://www.hhs.nd.gov/health/emergency-preparedness-and-response/health-alert-network>
 - **Travelers Health** - <https://wwwnc.cdc.gov/travel/notices>
 - **World Health Organization (WHO)** - <https://www.who.int/emergencies/disease-outbreak-news>

Report Suspect Cases

- Reportable Diseases – Chapter 23-07
 - <https://ndlegis.gov/cencode/t23c07.pdf?0=>
- Reportable Condition Rules – Article 33-06
 - <https://ndlegis.gov/information/acdata/pdf/33-06-01.pdf>



NORTH Dakota | Health & Human Services | **Mandatory Reportable Infectious Conditions**
 Be Legendary. | If highlighted red, report immediately: 800-472-2180 or 701-328-2378
 Report all other conditions within one business day

Acute Flaccid Myelitis Alpha-gal Syndrome Anaplasmosis Anthrax ◆ 🚨 Arboviral infection (other) Babesiosis Botulism ◆ 🚨 Brucellosis ◆ 🚨 Campylobacteriosis <i>Candida auris</i> ◆ Carbapenem-resistant organisms • <i>Enterobacteriales</i> ◆ • <i>Pseudomonas aeruginosa</i> ◆ • <i>Acinetobacter baumannii</i> ◆ Chickenpox (varicella) Chikungunya virus disease Chlamydial infection Cholera ◆ Cluster of severe or unexplained illnesses and deaths Coccidioidomycosis Creutzfeldt-Jakob disease Cryptosporidiosis Cyclosporiasis Dengue Diphtheria ◆ Eastern equine encephalitis 🚨 <i>E. coli</i> (Shiga toxin-producing) ◆ Ehrlichiosis Foodborne/waterborne outbreaks Giardiasis Glanders ◆ 🚨 Gonorrhea <i>Haemophilus influenzae</i> (invasive) ◆ Hantavirus ◆ Hemolytic uremic syndrome Hepatitis A ◆ Hepatitis B ¹ Hepatitis C ¹	Hepatitis D Hepatitis E HIV/AIDS infection ² Influenza ³ • Pediatric deaths ◆ • Suspect novel, PCR influenza A unsubtypeable ◆ Jamestown Canyon virus disease Laboratory incidents with possible release of category A agents or novel influenza virus 🚨 La Crosse encephalitis Legionellosis Leptospirosis Listeriosis ◆ Lyme disease Malaria ◆ Measles (rubeola) ◆ Melioidosis ◆ 🚨 Meningococcal disease (invasive) ◆ Mpox ◆ 🚨 Mumps ◆ Nipah virus infections ◆ 🚨 Nosocomial (healthcare-associated) outbreaks Novel severe acute illness ◆ 🚨 Pan-resistant Organisms ◆ Pertussis Plague ◆ 🚨 Poliomyelitis ◆ Powassan virus disease Pregnancy in person infected with: • Hepatitis B • Hepatitis C • HIV • Syphilis Q fever ◆ 🚨 Rabies (all results) • Human ◆ and Animal	Respiratory Panel Results ³ Respiratory Syncytial Virus ³ • Pediatric deaths Rocky Mountain spotted fever Rubella ◆ Salmonellosis ◆ SARS-CoV-2 ³ • Pediatric deaths Scabies outbreaks in institutions Shigellosis ◆ Smallpox ◆ 🚨 <i>Staphylococcus aureus</i> • Vancomycin-resistant and intermediate resistant (VRSA and VISA) – any site ◆ <i>Staphylococcus enterotoxin B</i> intoxication ◆ 🚨 St. Louis encephalitis <i>Streptococcus pneumoniae</i> infection (invasive) ◆ Syphilis Tetanus Tickborne disease (other) ◆ Trichinosis Tuberculosis ⁴ • Disease ◆ • Infection Tularemia ◆ 🚨 Typhoid fever ◆ Unexplained or emerging critical illness/death Vibriosis ◆ Viral hemorrhagic fevers 🚨 Weapons of Mass Destruction suspected event 🚨 Western equine encephalitis West Nile virus Yellow fever ◆ Zika virus
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◆ Send isolate or sample to North Dakota Department of Health and Human Services (HHS) Laboratory Services.
🚨 This is a Select Agent when confirmed. Notify HHS Laboratory Services at 701-328-6272. Report any possible lab exposures.

- Hepatitis B & C: All positive/reactive test results, hepatitis C genotypes, all hepatitis B & C nucleic acid test results (including nondetectable).
- HIV/AIDS: Any positive/reactive test results, gene sequencing and drug resistance patterns, all HIV nucleic acid test results (including nondetectable), all CD4 test results
- Electronic laboratory reports only
- TB: All positive PPD & IGRAs results. All results for AFB Smears, cultures and rapid methodologies performed when *M. tuberculosis* complex is suspected.

How to Report: • Secure website: <https://hhs.nd.gov/healthreportcard> • Telephone: 701-328-2378 or 800-472-2180 • Secure Fax: 701-328-0355 • Electronic laboratory report: <https://www.hhs.nd.gov/electronic-laboratory-reporting>

North Dakota Administrative Code 33-06-01, North Dakota Century Code 23-07-01 Updated 12/2023

Why and How to Report to Public Health

- It is important to report to public health promptly.
 - Take immediate public health action
 - Collect appropriate specimens
- Conditions requiring immediate notification should be reported via telephone.
 - Business hours at 701-328-2378
 - After hours at 701-220-0819
- All other non-urgent reporting can be done via on-line report form, fax, electronic laboratory reporting (ELR), or telephone.

References

- <https://www.hhs.nd.gov/health/diseases-conditions-and-immunization/reportable-conditions>
- <https://www.cdc.gov/flu/avianflu/hpai/hpai-interim-recommendations.html>
- <https://www.cdc.gov/measles/index.html>
- <https://www.cdc.gov/parasites/malaria/index.html>
- <https://www.cdc.gov/dengue/index.html>
- <https://www.cdc.gov/lyme/index.html>
- <https://www.cdc.gov/coronavirus/mers/index.html>
- <https://www.cdc.gov/powassan/index.html>
- <https://www.cdc.gov/heartland-virus/index.html>
- <https://www.cdc.gov/bourbon-virus/index.html>
- <https://www.cdc.gov/vhf/ebola/index.html>
- <https://www.cdc.gov/zika/index.html>
- <https://www.cdc.gov/ncezid/what-we-do/climate-change-and-infectious-diseases/index.html>
- <https://www.cdc.gov/ncezid/what-we-do/2022-highlights/emerging-infectious-diseases.html>
- <https://www.cdc.gov/drugresistance/index.html>

A wide-angle photograph of a vast agricultural field filled with golden hay bales. The bales are scattered across the field, with one particularly large and prominent bale in the foreground. The field is bathed in warm, golden light, suggesting late afternoon or early morning. The sky is a deep, dark blue, filled with wispy white clouds. A faint rainbow is visible in the sky, arching over the field. The overall scene is peaceful and evokes a sense of accomplishment and gratitude.

Thank You