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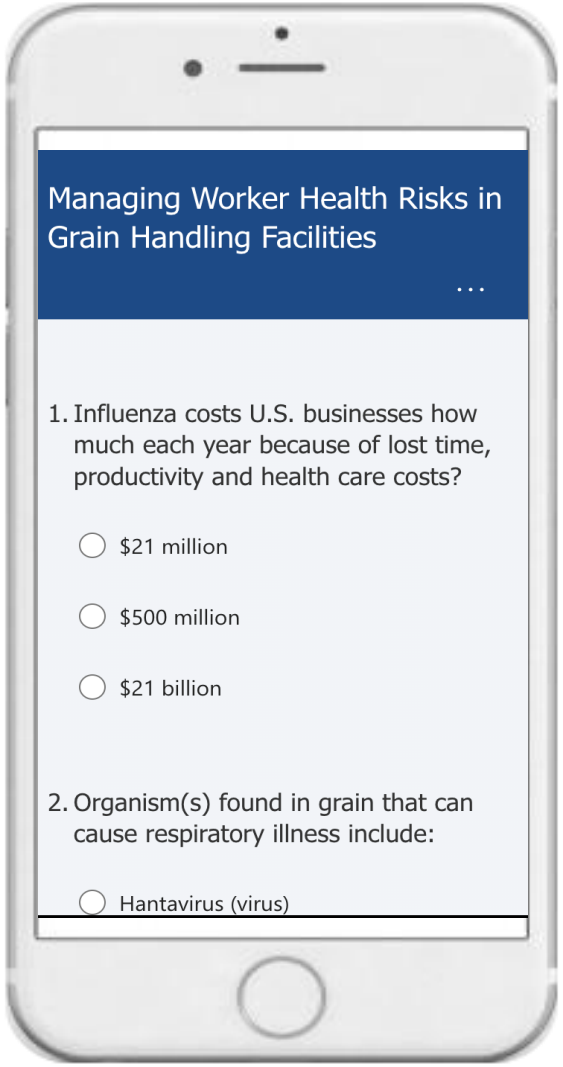

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Managing Worker Health Risks in Grain Handling Facilities

Some Simple Solutions

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Safety and Health

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Some Simple Solutions

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Research Assistant Professor

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A little about me…

- Researcher
- Safety Outreach Gal
- Admirer of Giant Horses
- Hog Farmer
- Cattle Wrangler
- Mom/Grandma

Bring up Microsoft Forms Survey Results

Central States Center for Agricultural Safety and Health

University of Nebraska Medical Center

11 US Ag Centers

7 States in CS-CASH Region

Research

Prevention

Education

Outreach

Take home messages -

Define	Define an Infectious Disease.
Identify	Identify causes of Infectious Disease in ag settings (grain handling facilities).
Understand	Understand how infectious agents are transmitted to and between humans.
Discuss	Discuss simple solutions that can be implemented into your risk management plan.

Why discuss infectious disease in the grain industry?

The Cost of Infectious Disease
Top 10 Causes of Death in U.S. 2020

- Heart disease: 696,962
- Cancer: 602,350
- COVID-19: 350,831
- Accidents (unintentional injuries): 200,955
- Stroke (cerebrovascular diseases): 160,264
- Chronic lower respiratory diseases: 152,657
- Alzheimer's disease: 134,242
- Diabetes: 102,188
- Influenza and pneumonia: 53,544
- Nephritis, nephrotic syndrome, and nephrosis: 52,547

https://www.cdc.gov/nchs/fastats/leading-causes-of-death.htm

The Economic Cost to Industry of Infectious Disease

Influenza

- **2017-2018 PRODUCTIVITY LOSS ESTIMATE –INFLUENZA**

- 25,000,000 workers sickened
- $26.74 – average hourly wage (Bureau of Labor Statistics)
- $855.68 – average wages lost due to missing four eight-hour shifts
- Estimated Losses: $21.39B

The Economic Cost to Industry of Infectious Disease

COVID-19

In 2021-2022, workers' pandemic-related absences cost employers more than $78.4 billion — nearly $1 billion each week

Calculated from disability wage payments, state disability insurance, sick leave wages and employee benefits

(Integrated Benefits Institute).

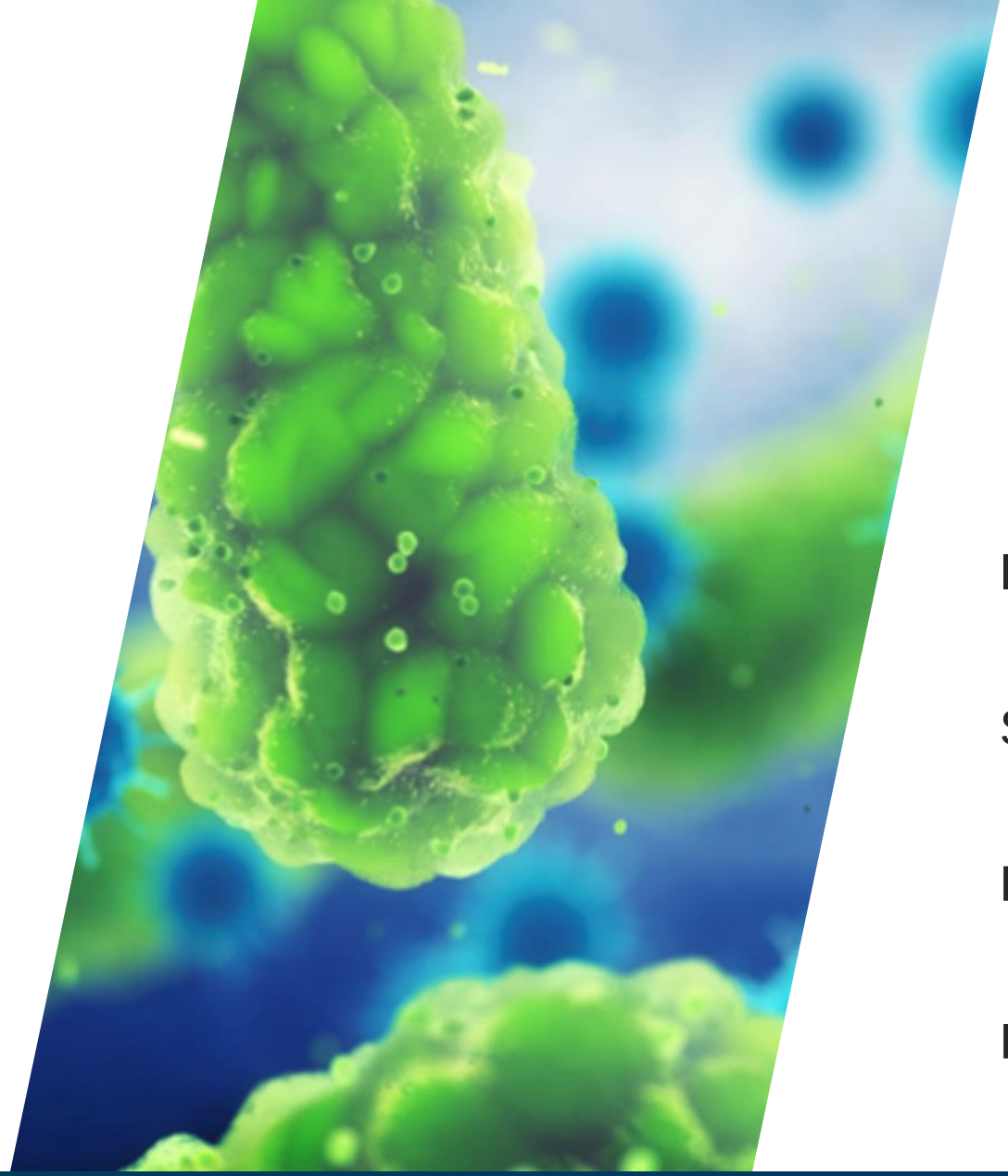
Healthy Workers = Healthy Industries

Maintaining a healthier workforce can

- lower direct costs such as insurance premiums and worker's compensation claims.
- positively impact many indirect costs such as absenteeism and worker productivity.[1, 2]

1. Sorensen G, Stoddard A, LaMontagne A, Emmons K, Hunt M, Youngstrom R, et al 2002;13:493–502.

2. Sorensen G, Barbeau EM, Stoddard AM, Hunt MK, Kaphingst K, Wallace L 2005;95(8):1389–1395.



Infectious Disease

Infectious disease is caused by organisms within the body.

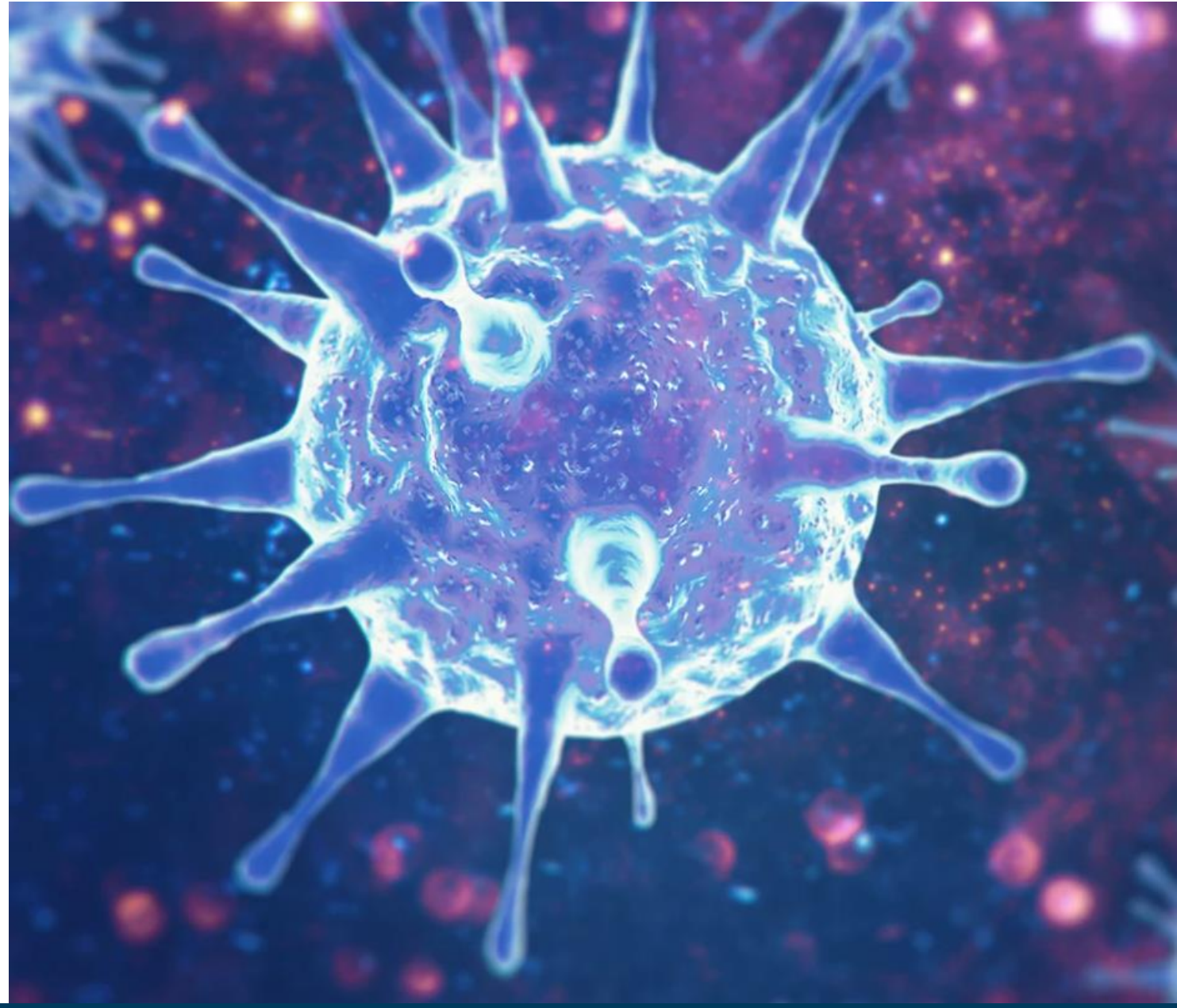
Spread -

From person to person - **Contagious**

From one species to another - **Zoonosis**

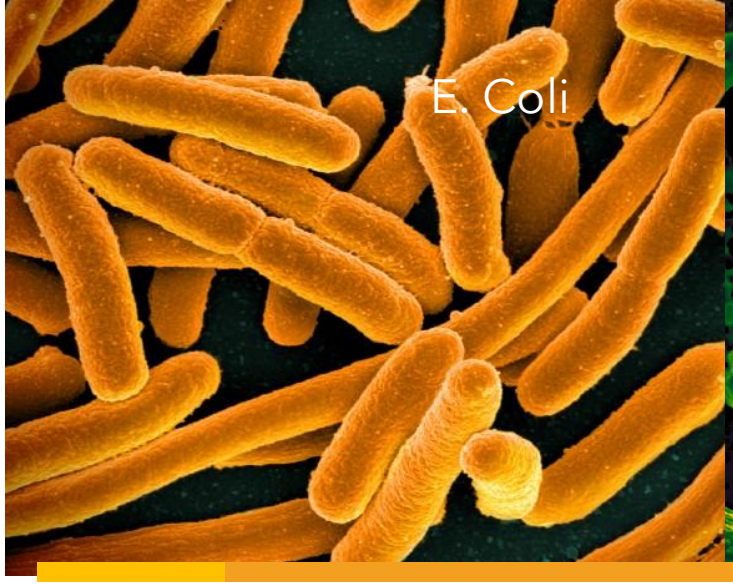
Four Organisms that Cause Disease

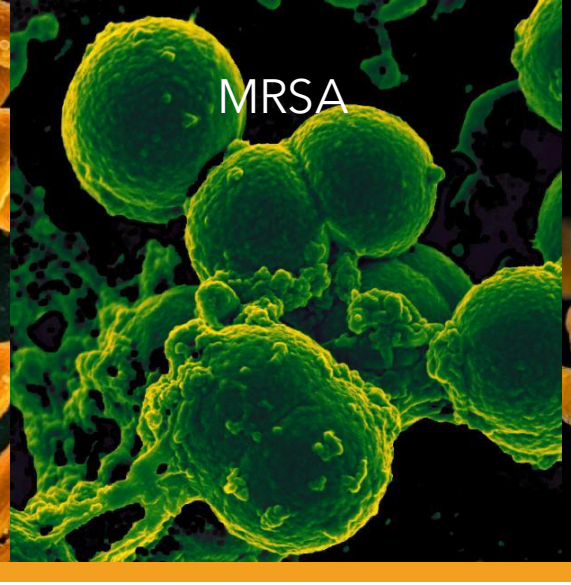
- Bacteria
- Virus
- Parasites
- Fungus

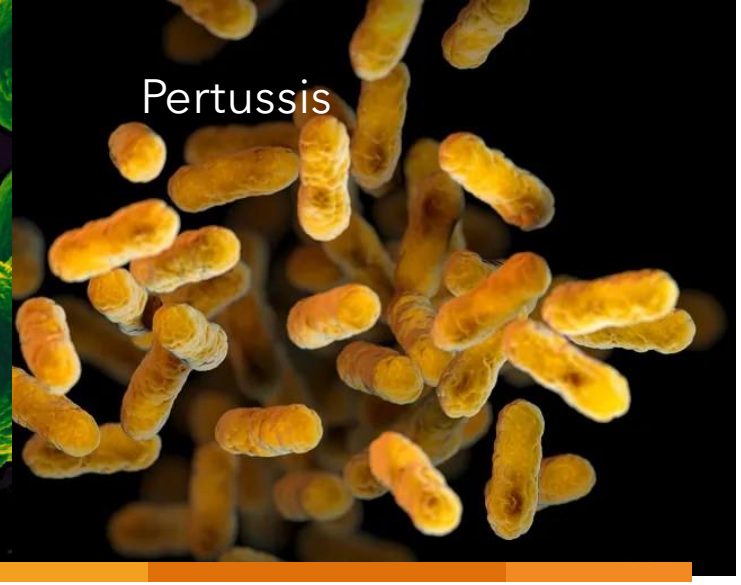


Bacteria

- Found throughout nature. Usually single cell organism.
- People & animals carry millions – in gut, on skin
- Most are harmless and many beneficial.
- 1% are pathogenic & cause infectious diseases.







Bacterial Infections

May be treatable with antibiotics

Some bacteria are controlled by vaccines

Some contagious

Respiratory Infections – are the most commonly fatal bacterial disease

Bacteria Found in Agricultural Settings

Spread to Humans By:

- Soil, Dust
- Rodents
- Livestock
- Humans
- Water, Food

Anthrax

- *In soil. Vaccinate cattle. Not contagious.*

Bordatella

- *Whooping cough, kennel cough atrophic rhinitis*

Lyme Disease

- *Bite of deer tick*

Camplyobacter

- *Food poisoning; poultry*

Clostridium

- *Common food poisoning - raw meat, poultry*

E. Coli

- *Food poisoning - food/water, cows*

Mycobacterium

- *Tuberculosis*

Salmonella

- *Food poisoning – food/water, animals*

Shigella

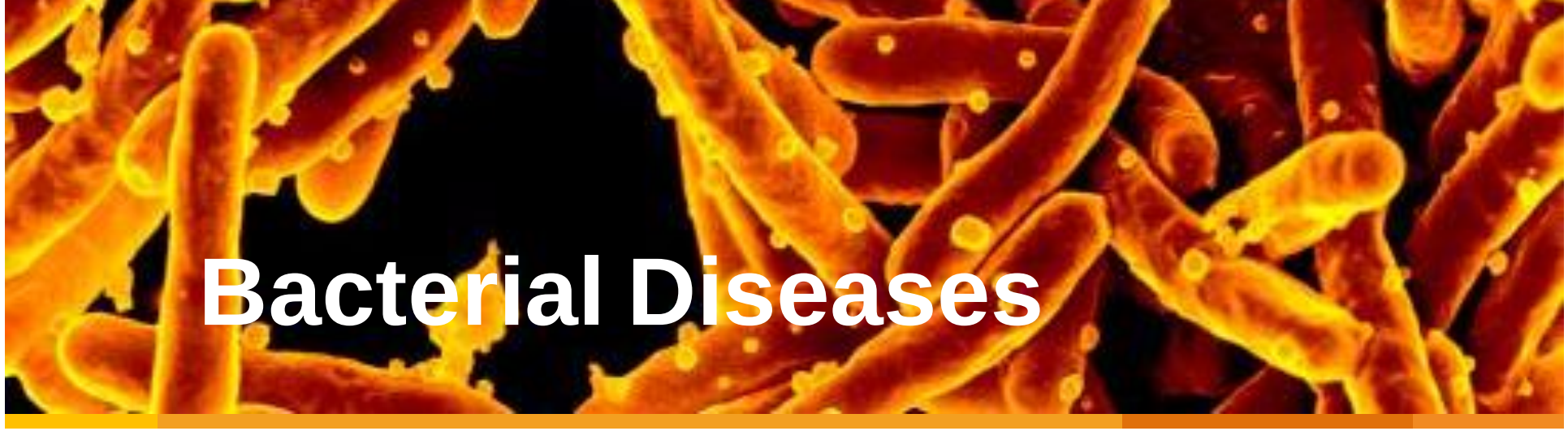
- *Contaminated drinking/recreational water; feces*

Vibrio

- *Raw/undercooked shellfish esp. oysters*

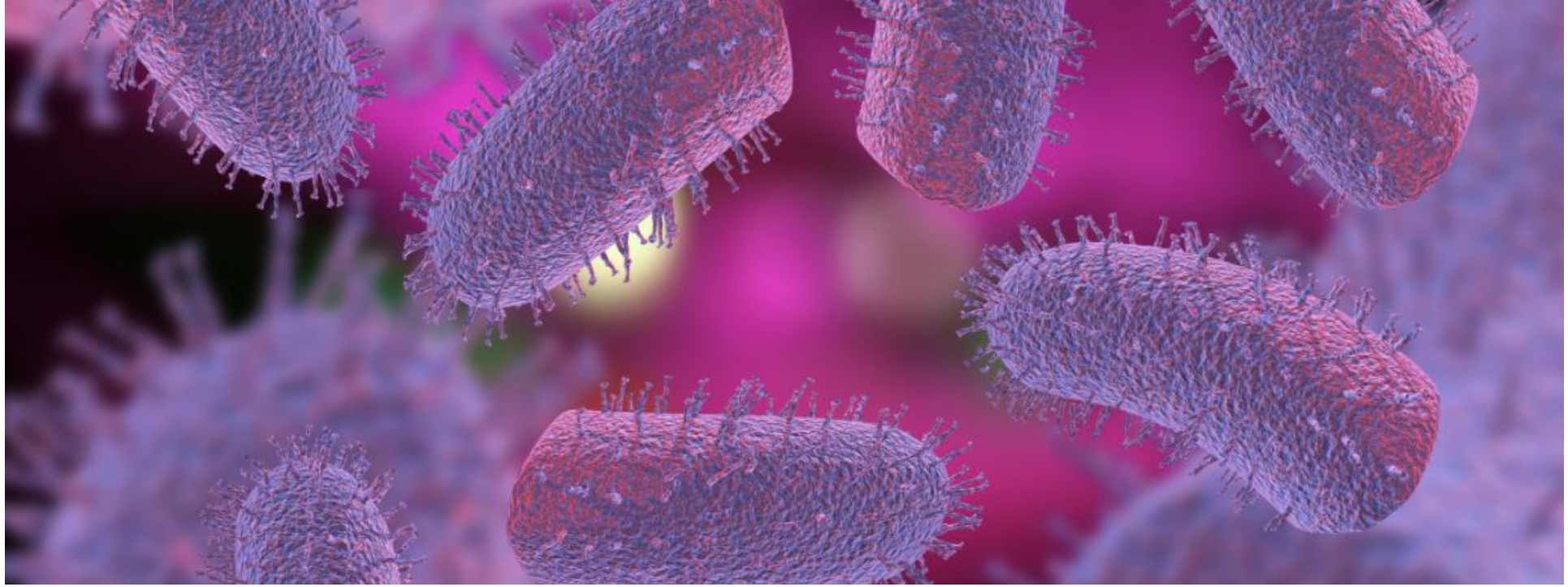
Yesinia Pestis

- *Plague; bite from rodent flea*



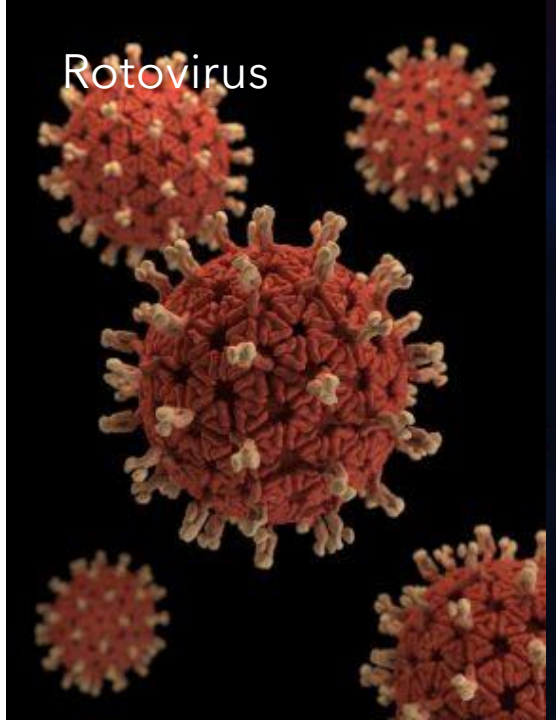
Bacterial Diseases

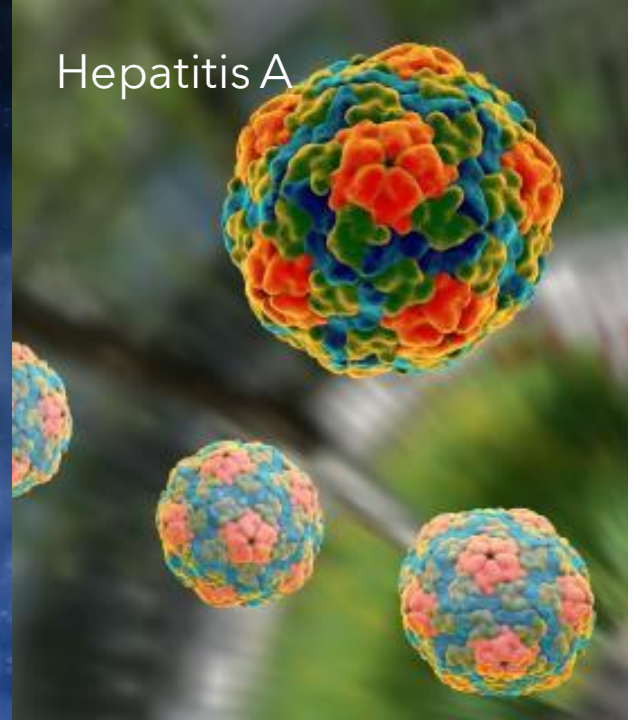
- Food Poisoning
  - E. Coli
  - Salmonella
  - Botulism, Listeria
  - Others
- Strep Throat
- MRSA – Staph Infection
- Diphtheria
- Tetanus - Lockjaw
- Pertussis - Whooping cough
- Tuberculosis - TB
- Pneumonia – lung infection
- Septicemia – blood poisoning
- Meningitis – brain & spine infection



Viruses

- Submicroscopic infectious agent
- Invade living cells and use the cells to multiply
- Infects all life forms; found in most ecosystems

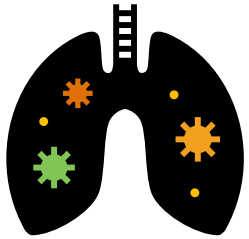




Viral Infections

- Common symptoms – flu-like (fever, chills, body ache, weakness, fatigue)
- Anti-viral agents used to treat. Not antibiotics.
- Vaccines for some viral infections

Types of Viral Infections

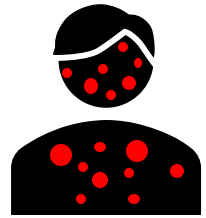


Respiratory

- Upper & lower respiratory tract
- Usually contagious
- Cold, Flu, RSV, SARS, Swine Flu, COVID-19

Stomach

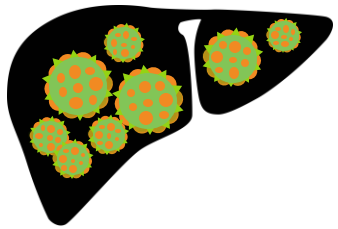
- “Stomach Flu”
- Digestive tract
- Contagious
- Norovirus, Rotovirus



Eruption/Rash

- Appear on skin
- Highly contagious
- Measles, Rubella, Chicken Pox, Hand-Foot-Mouth disease

Types of Viral Infections



Liver

- Inflammation of the liver
- Hepatitis A, B, C, D, and E

Skin

- Lesions/papules form on skin
- Contagious
- Warts, herpes

Nervous System

- Infect brain & surrounding tissue
- Polio – highly contagious
- Viral Meningitis, Viral Encephalitis, Rabies

Viruses Found in Agricultural Settings

Spread to Humans By:

- Insects
- Rodents
- Birds
- Livestock
- Humans
- Water

Flavivirus - insects
Hantavirus - rodents
Hepatitis E – meat products
Influenza – poultry, swine, other workers
Rabies – mammals
Norovirus – pigs, cattle, other workers
Rotavirus - water
West Nile Virus - mosquitos
Corona Virus – COVID-19, other Workers

Parasites

- Use other living things - like your body - for food and a place to live.
- Range in size from tiny, one-celled organisms to worms that can be seen with the naked eye.

Parasites Found in Agricultural Settings

Spread to Humans By:

- Soil
- Livestock
- Animals
- Insects
- Water
- **Food**
- **Blood**

Cryptosporidium parvum
Crypto

Cyclospora
Cyclosporiasis

Entamoeba histolytica
Amoebiasis or amoebic dysentery

Giardia lamblia
Giardia – Most common parasite in US

Leishmania spp.
Leishmaniasis

Plasmodium spp.
Malaria

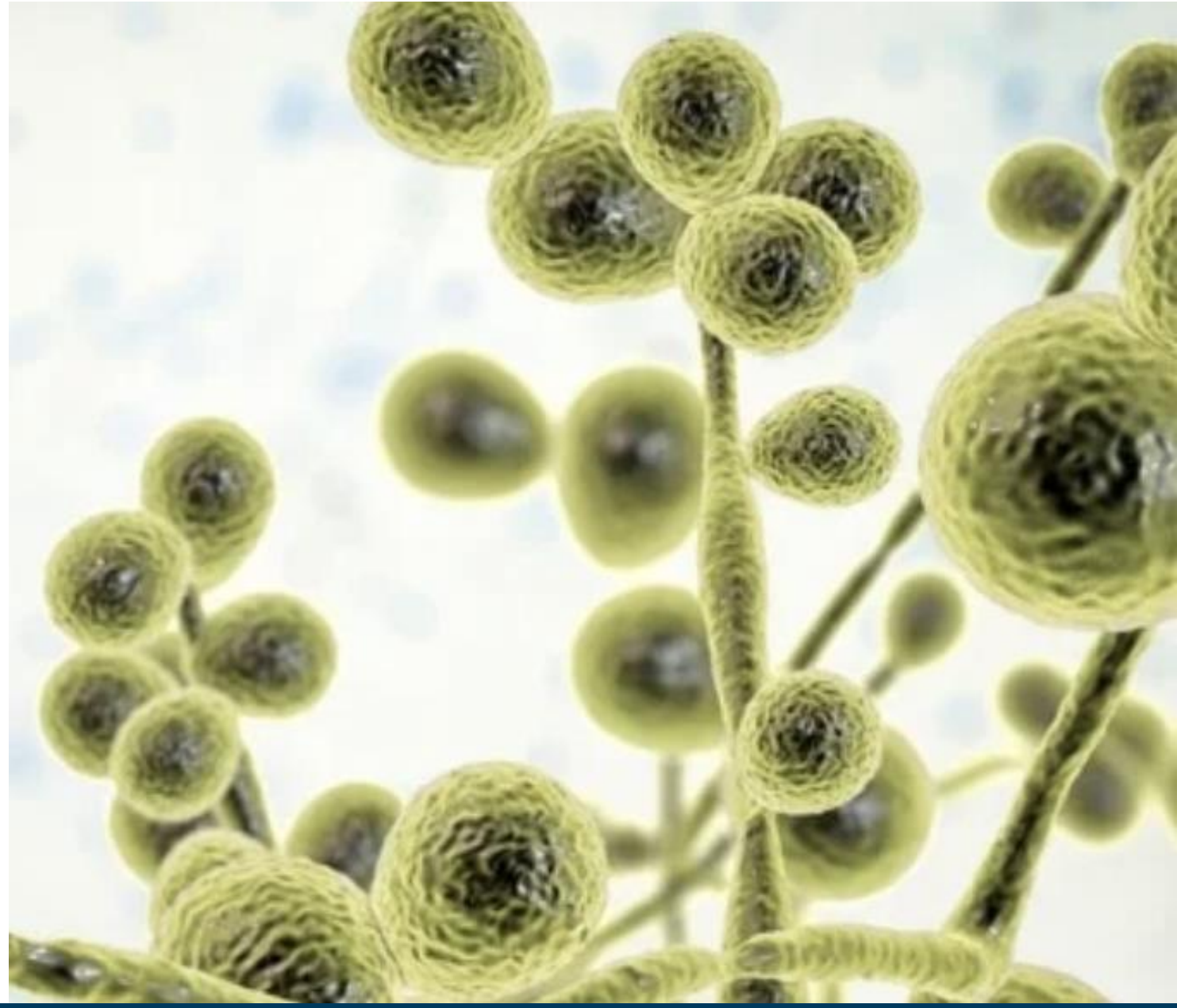
Schistosoma spp.
Blood flukes

Taenia spp.
Tapeworm

Trichinella spiralis
Trichinosis

Fungus

- There are millions of fungal species
- Only a few hundred of them can make people sick.
- Molds, yeasts, and mushrooms are all types of fungi.



Diseases caused by Fungus in Ag Settings

Aspergillus

The mold that causes aspergillosis, is very common in agriculture grains, grasses and hay.

Breathing *Aspergillus* spores can cause an infection in the lungs or sinuses which can spread to other parts of the body.

Diseases caused by Fungus in Ag Settings

Ring Worm

Ringworm is a common skin infection that is caused by a fungus.

Anyone can get ringworm. The fungi that cause this infection can live on skin, surfaces, and on household items such as clothing, towels, and bedding.

Cattle, horses, sheep and hogs can be all transfer ringworm to handlers.

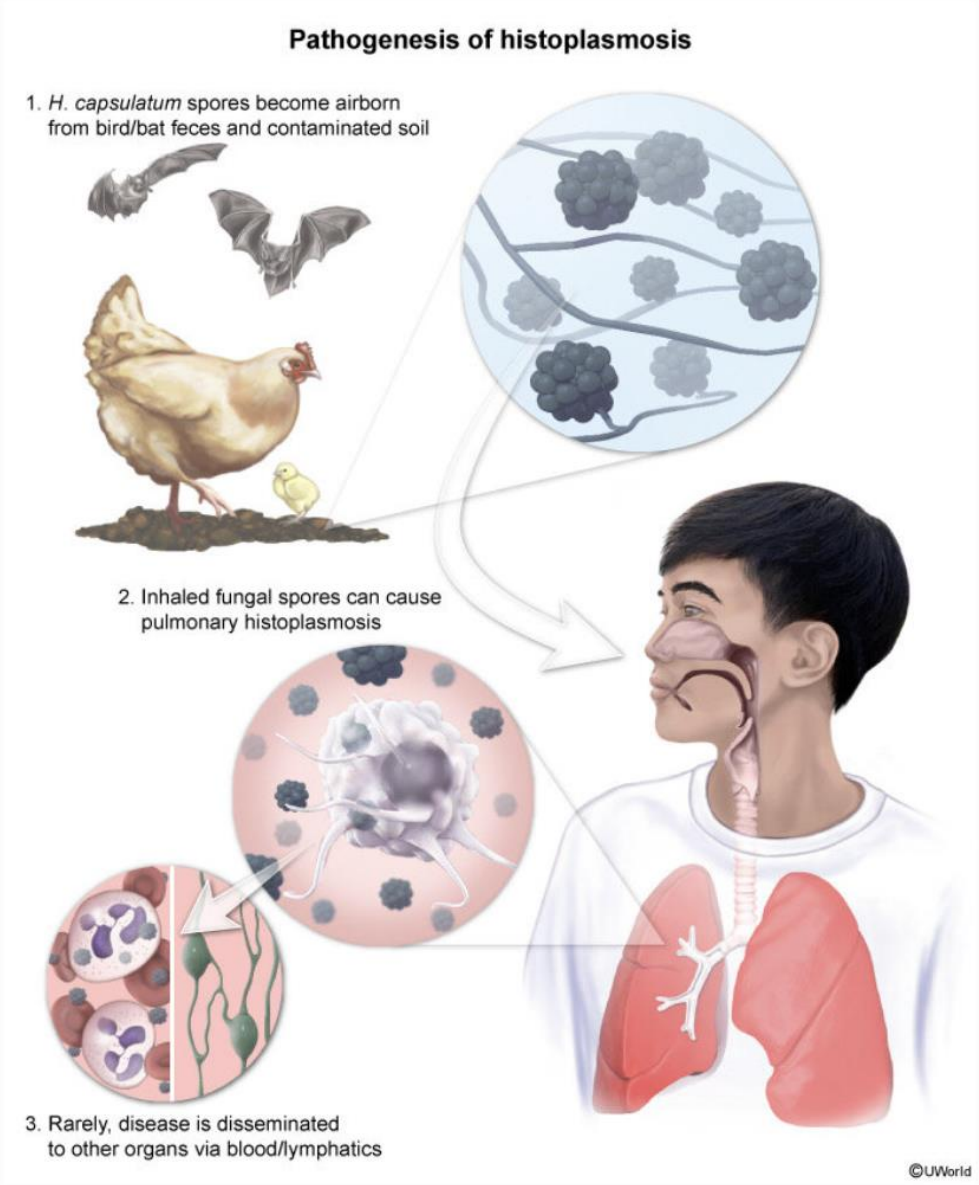
Diseases caused by Fungus in Ag Settings

Histoplasmosis

An infection caused by a fungus called *Histoplasma.*

The fungus lives in the environment, particularly in soil that contains large amounts of bird or bat droppings.

Barns, bins and other enclosed settings.



WHY DO INFECTIOUS DISEASES THRIVE IN WINTER?

- Colds, flus and other respiratory illnesses are more common in colder months.
- People are indoors more often, allowing viruses to pass more easily from one person to another.
- And the cold, dry air may weaken resistance.

COVID-19 What we Know

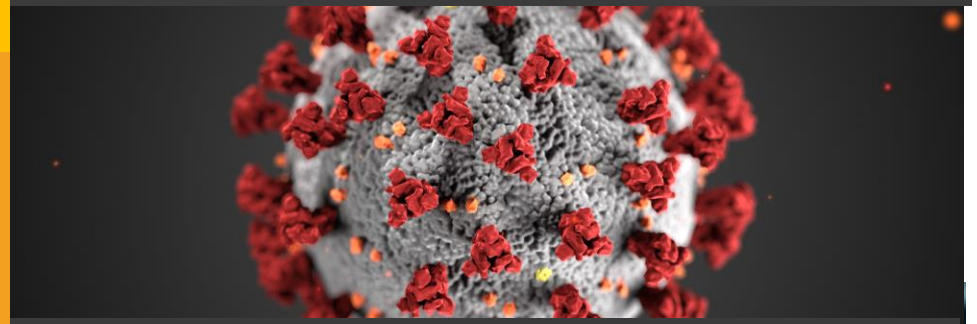
- Spreads rapidly; droplets spray.
- Symptoms – range none to severe.
  - Appear 2-14 days after exposure
  - Can be contagious **BEFORE** symptoms show
  - Most contagious when most symptomatic
- Higher risk of severe illness for elderly & those with health conditions.
  - Heart disease, lung disease (asthma, etc.), diabetes, suppressed immune system
- Known "best practices" reduces transmission

Flu vs COVID-19

SARS CoV-2 (virus) that causes COVID 19

- **MUCH** more infectious
- Spreads **faster** than flu
- COVID-19 (disease) causes **more** deaths & hospitalizations
- COVID symptoms can be **MUCH** more severe than flu

Two different Viruses:



SARS CoV-2 Notice the crowns

Influenza (Flu) – No crowns

Did you know?

Flu vaccines are changed each year as the flu virus mutates quickly.

How We Get Infectious Diseases

Routes of Transmission

Airborne Transmission

Droplet spread - the secretions from mouth & nose projected when a person sneezes or coughs

Droplets travel up to 3 feet

Transmission – infected droplets

- Inhaled by other people
- Get in other peoples' eyes
- Land on surfaces people touch

Examples: Influenza, COVID-19

Bite Transmission

Bite penetrates skin

Animals

Insects

Infectious organisms in saliva transmitted directly into bloodstream.

Examples:

Rabies – animal bites

West Nile & Zika – mosquito bites

Contaminated Water Transmission

Contaminated wells, stock tanks, and farm ponds can be infected with virus, bacteria & parasites.

Examples:

E. Coli

Rotavirus

Giardia lamblia

Animal Feces Transmission

Ingesting dust or water containing feces from rodents or livestock can cause viral or bacterial disease.

Examples:

Respiratory Disease

Hanta Virus in rodent urine, droppings, or saliva

Vector Transmission

Examples: Ticks, Mosquitos, Lice, and Fleas

- Vectors - living organisms
- Transmit infectious pathogens
  - Between humans
  - Animals to humans
- Usually, bloodsucking insects
  - Ticks, Mosquitoes, Lice, Fleas
  - Ingest disease-producing microorganisms from infected host (human or animal) and transmit it into a new host.

Contaminated Surfaces Transmission

Touching your eyes, nose or face after contact with a contaminated surface often leads to infection.

Surface contamination:

Droplet spread

Infected person or animal

Bodily fluids

- Mucus, blood, urine, feces
- Frequently touched

Prevent Infectious Disease Spread

Proven Low-Cost Protection Measures

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Handwashing

Most effective way to prevent infectious disease spread

- Before starting work
- Before & after eating
- After sneezing or coughing
- After using the restroom
- After touching surfaces others have touched
- After using tools, equipment or vehicles
- After handling crops or animal products
- After handling livestock
- Before going home

Wash hands for at least

20 seconds

The friction between your hands will help to remove virus and bacteria.

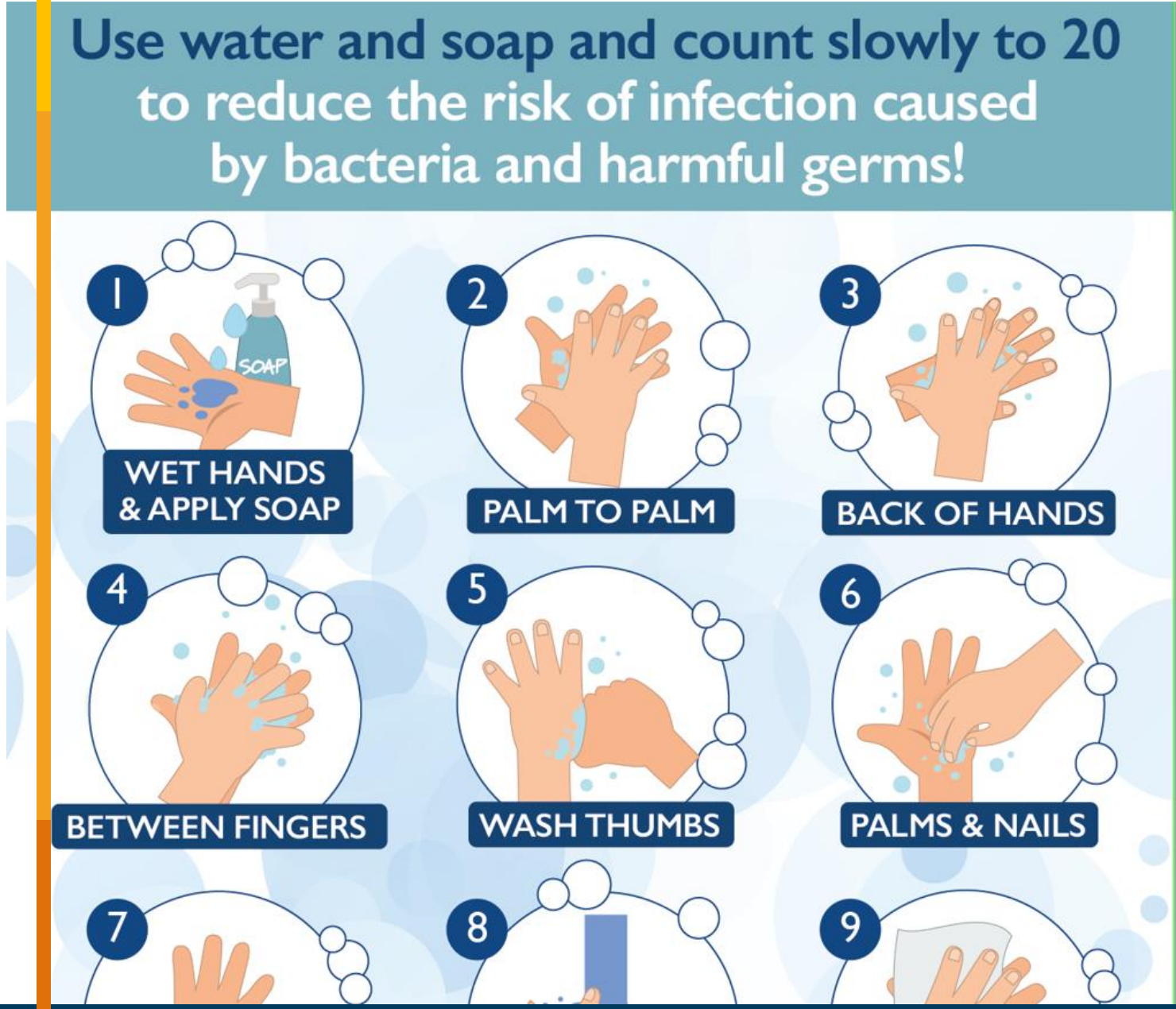
If soap & water are not available, use hand sanitizer with at least 60% ethanol.

Handwashing Poster(s) for your workplace

Email me:

ellen.duysen@unmc.edu

- Provide
- Name
- Mailing address
- Number of laminated posters you would like



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Wear a Mask

Protect your lungs and wear a two-strap N95 mask when:

- Agricultural dust exposure

  May contain livestock or rodent feces

- You, co-worker, or family member is showing signs of a respiratory infection

Keep a supply of N95 respirators on hand for voluntary use by employees during flu season.

Immunization

- Influenza (Flu) – yearly
- Tetanus – every 10 years
- Hepatitis B
- Shingles
- COVID-19 (follow CDC)
- Shingles
- Others – depending on area, travel, etc.

Stay current on immunizations (vaccines)

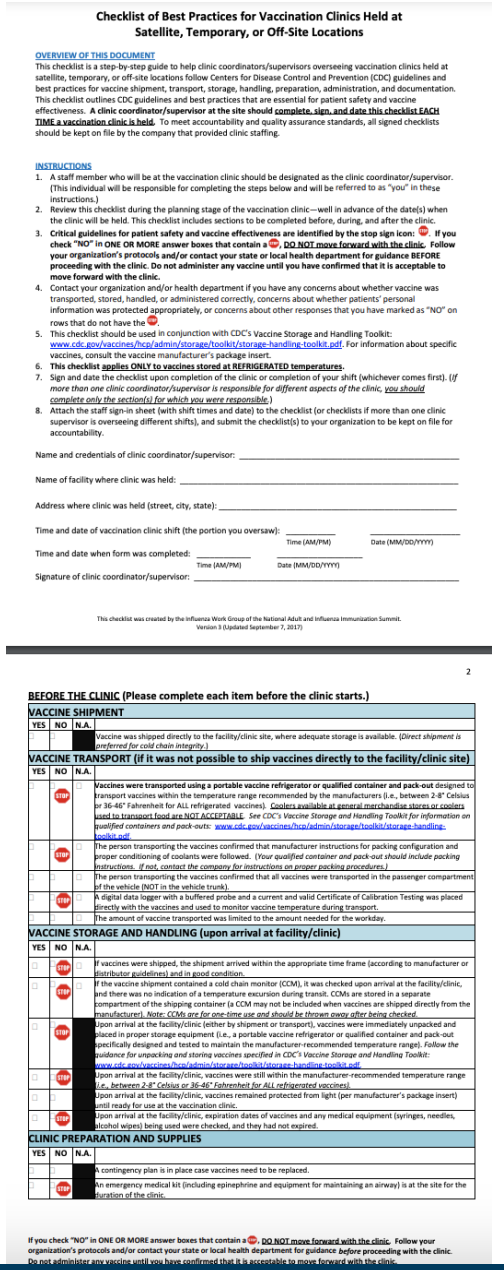
Workplace Vaccination Clinic

Sponsor a vaccination clinic at your workplace on company time.

Engage your local health department.

Invite your local pharmacist

Make it an easy process, a simple decision.



Checklist of Best Practices for Vaccination Clinics Held at Satellite, Temporary, or Off-Site Locations

OVERVIEW OF THIS DOCUMENT

This checklist is a step-by-step guide to help clinic coordinators/supervisors overseeing vaccination clinics held at satellite, temporary, or off-site locations follow Centers for Disease Control and Prevention (CDC) guidelines and best practices for vaccine shipment, transport, storage, handling, preparation, administration, and documentation. This checklist outlines CDC guidelines and best practices that are essential for patient safety and vaccine effectiveness. **A clinic coordinator/supervisor at the site should complete, sign, and date this checklist EACH TIME a vaccination clinic is held.** To meet accountability and quality assurance standards, all signed checklists should be kept on file by the company that provided clinic staffing.

INSTRUCTIONS

1. A staff member who will be at the vaccination clinic should be designated as the clinic coordinator/supervisor. (This individual will be responsible for completing the steps below and will be referred to as "you" in these instructions.)
2. Review this checklist during the planning stage of the vaccination clinic—well in advance of the date(s) when the clinic will be held. This checklist includes sections to be completed before, during, and after the clinic.
3. **Critical guidelines for patient safety and vaccine effectiveness are identified by the stop sign icon: STOP. If you check "NO" in ONE OR MORE answer boxes that contain a STOP, DO NOT move forward with the clinic. Follow your organization's protocols and/or contact your state or local health department for guidance BEFORE proceeding with the clinic. Do not administer any vaccine until you have confirmed that it is acceptable to move forward with the clinic.**
4. Contact your organization and/or health department if you have any concerns about whether vaccine was transported, stored, handled, or administered correctly, concerns about whether patients' personal information was protected appropriately, or concerns about other responses that you have marked as "NO" on rows that do not have the STOP.
5. This checklist should be used in conjunction with CDC's Vaccine Storage and Handling Toolkit: www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf. For information about specific vaccines, consult the vaccine manufacturer's package insert.
6. **This checklist applies ONLY to vaccines stored at REFRIGERATED temperatures.**
7. Sign and date the checklist upon completion of the clinic or completion of your shift (whichever comes first). (*If more than one clinic coordinator/supervisor is responsible for different aspects of the clinic, you should complete only the section(s) for which you were responsible.*)
8. Attach the staff sign-in sheet (with shift times and date) to the checklist (or checklists if more than one clinic supervisor is overseeing different shifts), and submit the checklist(s) to your organization to be kept on file for accountability.

Name and credentials of clinic coordinator/supervisor: _____

Name of facility where clinic was held: _____

Address where clinic was held (street, city, state): _____

Time and date of vaccination clinic shift (the portion you oversaw): _____ (Time (AM/PM)) _____ (Date (MM/DD/YYYY))

Time and date when form was completed: _____ (Time (AM/PM)) _____ (Date (MM/DD/YYYY))

Signature of clinic coordinator/supervisor: _____

This checklist was created by the Influenza Work Group of the National Adult and Influenza Immunization Summit.
Version 3 (Updated September 7, 2017)

2

BEFORE THE CLINIC (Please complete each item before the clinic starts.)

VACCINE SHIPMENT			
YES	NO	N.A.	
☐	☐	☐	Vaccine was shipped directly to the facility/clinic site, where adequate storage is available. (*Direct shipment is preferred for cold chain integrity.*)
VACCINE TRANSPORT (if it was not possible to ship vaccines directly to the facility/clinic site)			
YES	NO	N.A.	
☐	STOP	☐	**Vaccines were transported using a portable vaccine refrigerator or qualified container and pack-out** designed to transport vaccines within the temperature range recommended by the manufacturers (i.e., between 2-8° Celsius or 36-46° Fahrenheit for ALL refrigerated vaccines). Coolers available at general merchandise stores or coolers used to transport food are NOT ACCEPTABLE. *See CDC's Vaccine Storage and Handling Toolkit for information on qualified containers and pack-outs:* www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf
☐	STOP	☐	The person transporting the vaccines confirmed that manufacturer instructions for packing configuration and proper conditioning of coolants were followed. (*Your qualified container and pack-out should include packing instructions. If not, contact the company for instructions on proper packing procedures.*)
☐	☐	☐	The person transporting the vaccines confirmed that all vaccines were transported in the passenger compartment of the vehicle (NOT in the vehicle trunk).
☐	STOP	☐	A digital data logger with a buffered probe and a current and valid Certificate of Calibration Testing was placed directly with the vaccines and used to monitor vaccine temperature during transport.
☐	☐	☐	The amount of vaccine transported was limited to the amount needed for the workday.
VACCINE STORAGE AND HANDLING (upon arrival at facility/clinic)			
YES	NO	N.A.	
☐	STOP	☐	If vaccines were shipped, the shipment arrived within the appropriate time frame (according to manufacturer or distributor guidelines) and in good condition.
☐	STOP	☐	If the vaccine shipment contained a cold chain monitor (CCM), it was checked upon arrival at the facility/clinic, and there was no indication of a temperature excursion during transit. CCMs are stored in a separate compartment of the shipping container (a CCM may not be included when vaccines are shipped directly from the manufacturer). *Note: CCMs are for one-time use and should be thrown away after being checked.*
☐	STOP	☐	Upon arrival at the facility/clinic (either by shipment or transport), vaccines were immediately unpacked and placed in proper storage equipment (i.e., a portable vaccine refrigerator or qualified container and pack-out specifically designed and tested to maintain the manufacturer-recommended temperature range). *Follow the guidance for unpacking and storing vaccines specified in CDC's Vaccine Storage and Handling Toolkit:* www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf
☐	STOP	☐	Upon arrival at the facility/clinic, vaccines were still within the manufacturer-recommended temperature range (*i.e., between 2-8° Celsius or 36-46° Fahrenheit for ALL refrigerated vaccines*).
☐	☐	☐	Upon arrival at the facility/clinic, vaccines remained protected from light (per manufacturer's package insert) until ready for use at the vaccination clinic.
☐	STOP	☐	Upon arrival at the facility/clinic, expiration dates of vaccines and any medical equipment (syringes, needles, alcohol wipes) being used were checked, and they had not expired.
CLINIC PREPARATION AND SUPPLIES			
YES	NO	N.A.	
☐	☐	☐	A contingency plan is in place case vaccines need to be replaced.
☐	STOP	☐	An emergency medical kit (including epinephrine and equipment for maintaining an airway) is at the site for the duration of the clinic.

If you check "NO" in ONE OR MORE answer boxes that contain a STOP, DO NOT move forward with the clinic. Follow your organization's protocols and/or contact your state or local health department for guidance *before* proceeding with the clinic. Do not administer any vaccine until you have confirmed that it is acceptable to move forward with the clinic.

Check Drinking Water Supply

Check wells yearly

Bacteria (E.coli, Enterobacter, Giardia & others)

Nitrates

Follow local Public Health Department suggestions if your well is contaminated with bacteria or has high nitrate levels.

Properly Dispose of Sharps

- Provide for a method of disposing of sharps
- Needlesticks after injection can lead to infectious disease.
- Do not recap needles.

Dispose of Infectious Waste

Provide a place for disposal of medical waste:

- Items with body fluids
- Animal Waste, bedding carcasses, etc.
- Personal Use Products
- Tissues, band-aids, etc.
- PPE – disposable masks, gloves, etc.
- Feminine hygiene

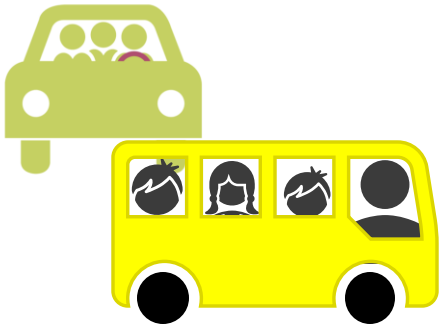
Prevent Vector Transmission

- Vector born disease
  - Ticks, mosquitoes, fleas, etc.
- Check for ticks & remove
- Provide repellent for workers in the field

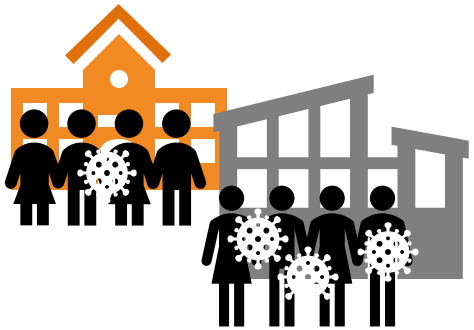
Personal Protective Equipment (PPE) at Work

- Use of PPE reduces infection spread
- Employers should
  - Assess PPE needs for each employee
  - Provide PPE, appropriate to hazards
  - Train employees how to put on/take off PPE
  - Train employees to maintain, store, replace PPE
  - Provide medical evaluation & fit testing
- Types of PPE
  - Gloves – protect against germs on surfaces
  - Respiratory – protect spreading or inhaling droplet spray
  - Glasses or shield – prevent infectious particles entering the body through the eyes

How Disease Spreads in the Community



Contact during Carpooling/school bus



Contact at school

Contact at work or while socializing

Contact during worship

THE DISEASE COMES HOME

Break Cycle of Infectious Disease

Illness affects

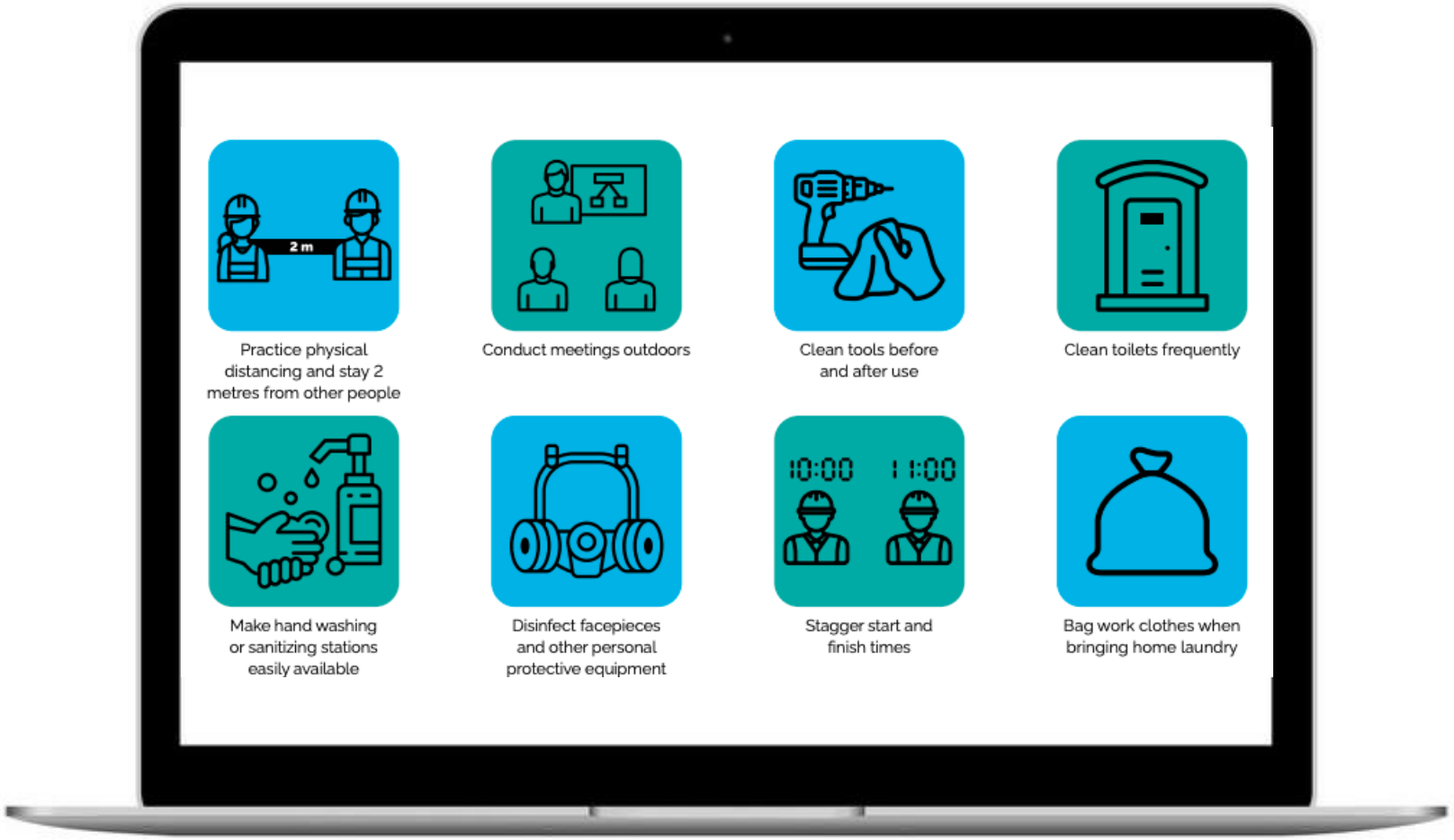
- Families
- Schools
- Workplaces
- Many in the community may become sick from a single event.
- Reduce the spread of infection - don't share germs!

At the first sign of illness encourage -

- workers to stay home!
- the use of masks when in contact with others
- **frequent hand washing or use hand sanitizer**
- avoiding close contact with coworkers & customers
- cleaning/disinfecting high touch areas frequently
- Avoiding shaking hands.

Workplace Best Practices

Create a company policy regarding infectious disease control.



Risk management plan

Production risk derives from the uncertain natural growth processes of crops and livestock. Weather, disease, pests, and other factors affect both the quantity and quality of commodities produced.

Price or market risk refers to uncertainty about the prices producers will receive for commodities or the prices they must pay for inputs. The nature of price risk varies significantly from commodity to commodity.

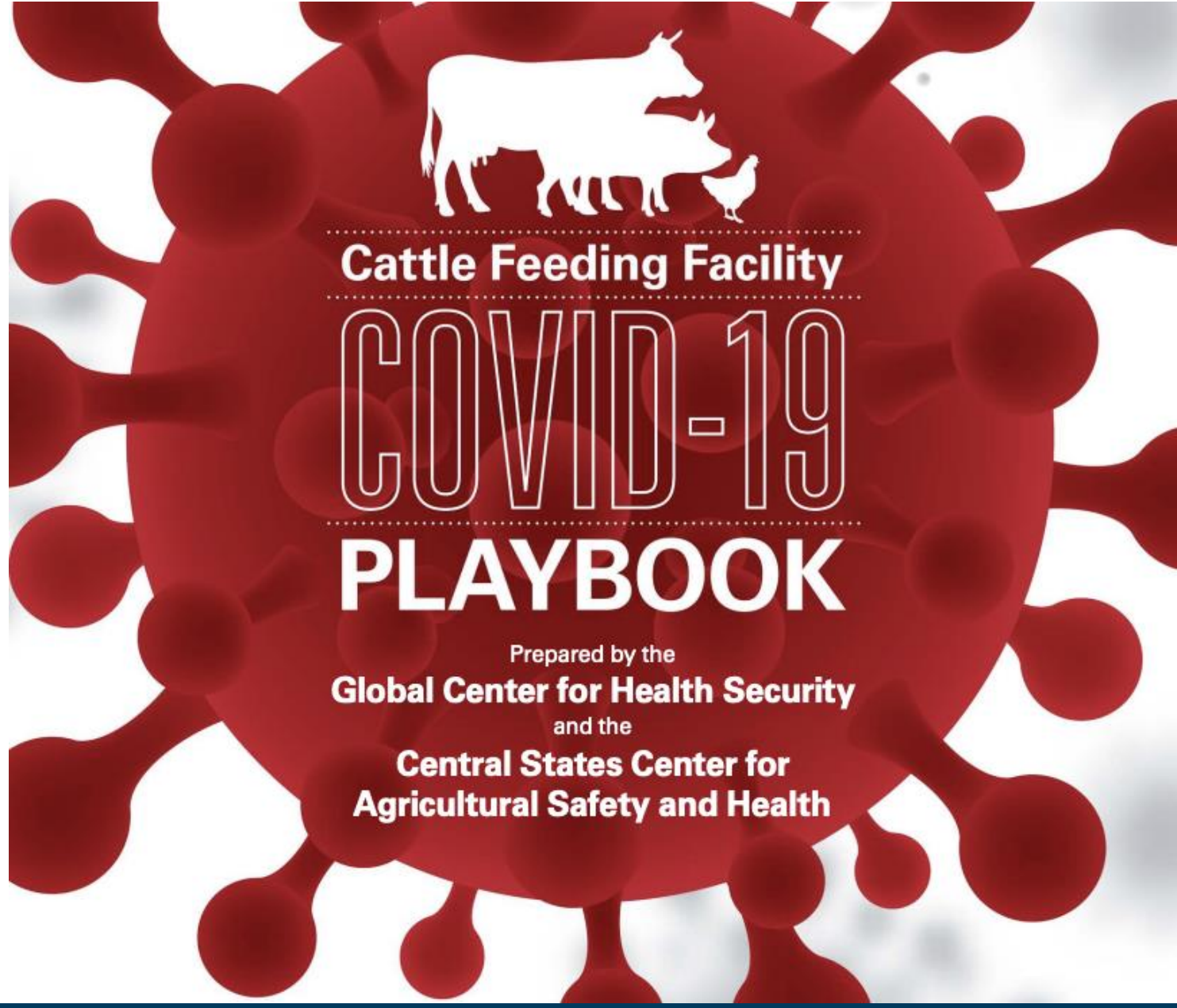
Financial risk results when the farm business borrows money and creates an obligation to repay debt. Rising interest rates, the prospect of loans being called by lenders, and restricted credit availability are also aspects of financial risk.

Institutional risk results from uncertainties surrounding Government actions. Tax laws, regulations for chemical use, rules for animal waste disposal, and the level of price or income support payments are examples of government decisions that can have a major impact on the farm business.

Human or personal risk refers to factors such as problems with human health or personal relationships that can affect the farm business. Accidents, illness, death, and divorce are examples of personal crises that can threaten a farm business.

Free step by step guide:

Playbook for prevention of infectious disease in agribusiness facilities



Protect our most valuable asset. Our Workers!

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Training produced in collaboration with the Grain Handling Safety Coalition and the University of Illinois – Urbana Champaign

Contact me for information, resources or training on prevention of disease in the workplace.

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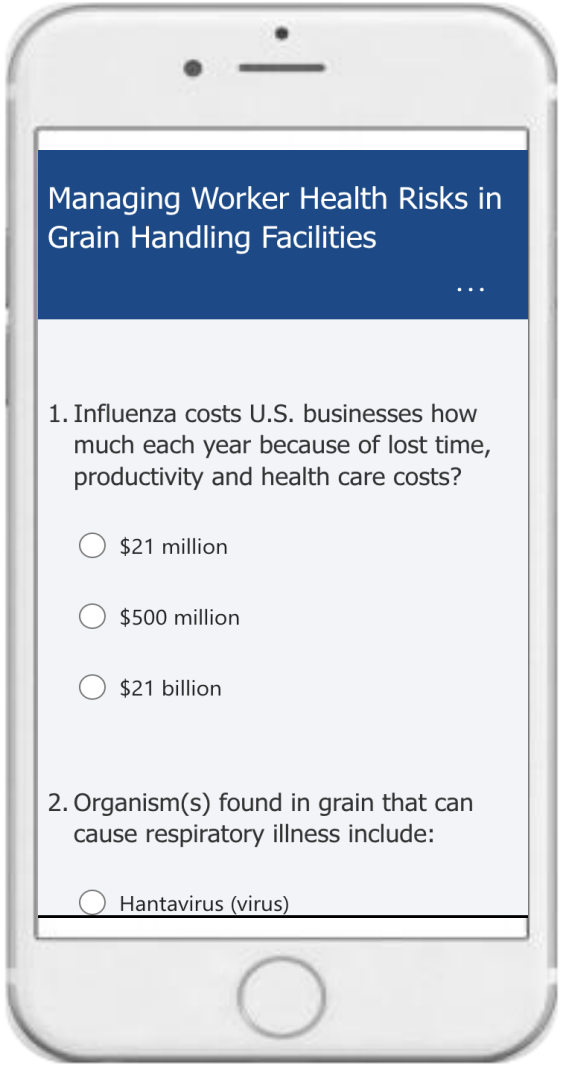
Take our Poll

- Visit this QR Code to take a short poll before the session starts.

https://forms.office.com/r/aKXgavTN3w



Bring up Microsoft Forms Survey Results

Win a GEAPS Prize Bundle!

Managing Worker Health Risks in Grain Handling Facilities- Post Survey

SCAN FOR SURVEY

Please take a short survey for this session to help us plan for next year.

For every survey you submit you will be entered into a drawing.

GEAPS Prize Bundle

- $200 Visa Gift card and free registration to Leadership Conference
- Raffle will be drawn at Closing Celebration, Tue 2/28

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