Introduction to Infectious Diseases

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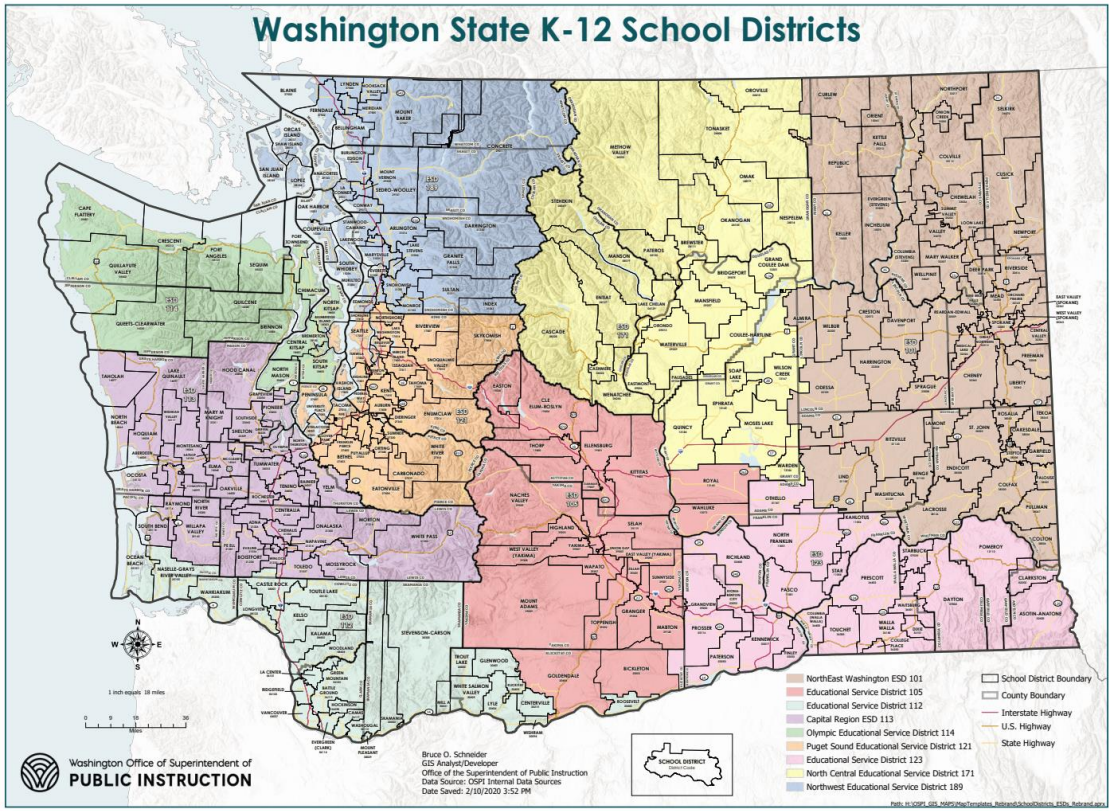


Topics

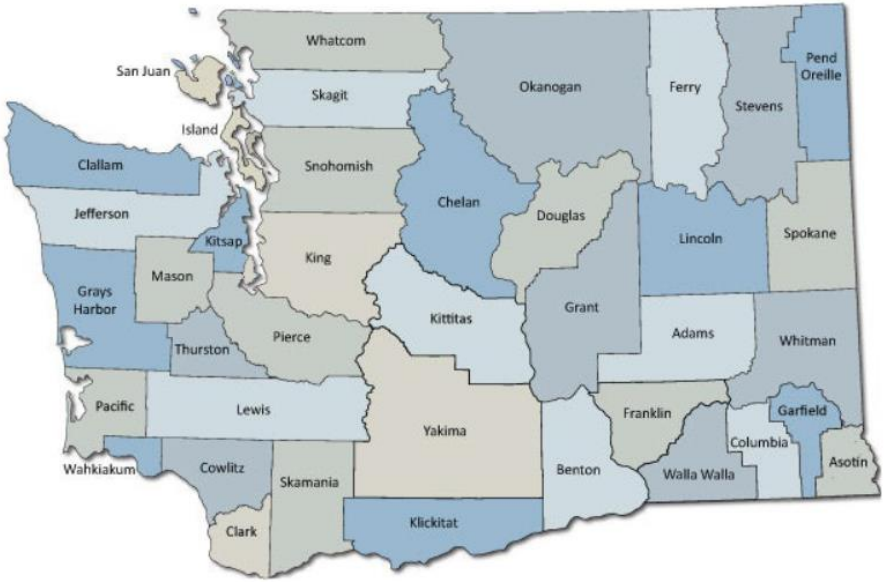
- Local health jurisdictions
- Host-agent-environment
- Routes of transmission
- Some school-related regulations
- Infectious agents

Public Health Authority

- Public health authority is not given to the federal government (via the United States Constitution)
- Public health authority therefore belongs to the states

Local Health Jurisdictions

- In Washington public health authority is with the local health jurisdiction/Tribe



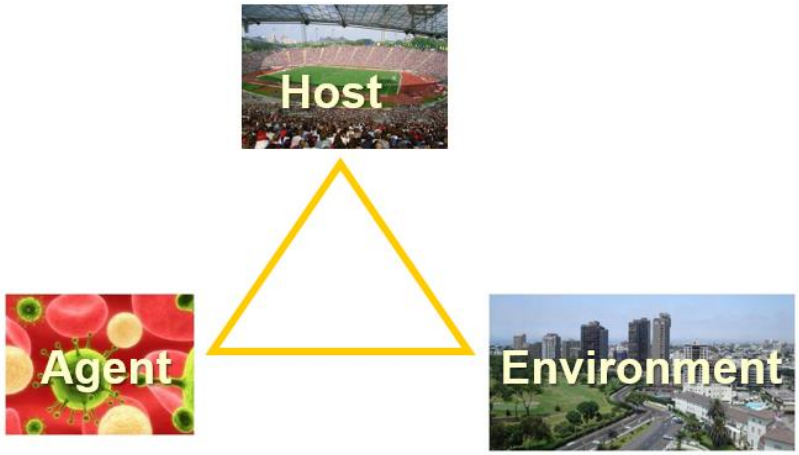
https://doh.wa.gov/about-us/washingtons-public-health-system/washington-state-local-health-jurisdictions

Infections Conditions

- Most microorganisms do not cause infections (and some are beneficial)
- A few microorganisms can cause infections
  - Some of those affect humans
- One way of looking at infectious conditions is host-agent-environment

Host-Agent-Environment

- Host: person or animal getting infected
- Agent: organism causing infection
- Environment: other factors affecting risk of being infected or having severe disease



Host – Person, Place, Time

- What characteristics of hosts make them more likely to be infected or more likely to have severe disease? Think about:
  - Person
  - Place
  - Time

Host – Immunity

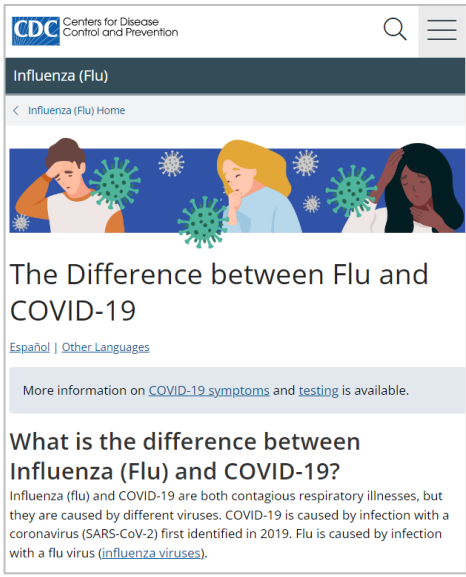
- Immunity ("exempt"): identify and eliminate foreign (non-self) material
- Depending on the agent, the immune system may prevent infection **or** may prevent symptoms but not infection (and are contagious if infected)
- After an infection, the host may have:
  - No immunity (gonorrhea)
  - Temporary immunity (cold)
  - Permanent immunity (measles)

Infectious Agents

- Differ in taxonomy (naming)
- Differ in transmission (spread)
- Differ in prevention and control

Infectious Agents

- The body responds to infections with a limited range of symptoms
  - Most viruses infect systemically (spread in the blood – causes fever)
  - Many viruses cause "flu-like" illness
- Symptoms are rarely unique
- Usually an examination and/or a laboratory test is needed to determine the specific disease
  - Often that doesn't matter
  - Sometimes it does



Infectious Agents – Naming (Taxonomy)

- Agents may be:
  - Proteins
  - Viruses
  - Bacteria
  - Fungi
  - Parasites
  - Note: this is simplified

Infectious Agents – Proteins

- Cause of "mad cow" disease as well as human versions (diseases known a spongiform encephalopathies)
- Abnormal proteins change the brain
- Requires exposure to brain tissue through food, surgical instruments, transplant
- Not a school problem

Infectious Agents – Viruses

- Minimum: genetic material + protein coat
- Depend on a cell to replicate
- Extremely varied
  - Mostly person-to-person spread
  - May survive in the environment
  - May need different cleaning methods

Infectious Agents – Viruses

- Enveloped virus has an outer layer coming from host cell's outer layer
  - More sensitive to disinfectants, drying, etc.
  - E.g., influenza, HIV, coronaviruses, herpesvirus, hepatitis B, hepatitis C
- Non-enveloped virus has no outer layer
  - Less sensitive to disinfectants, drying, etc.
  - E.g., noroviruses, enteroviruses, rhinoviruses, hepatitis A

Infectious Agents – Bacteria

- Simple cells
- Extremely varied
  - May spread differently
  - Some have person-to-person spread
  - May need different cleaning methods
  - May survive in the environment briefly or for years

Infectious Agents – Bacteria

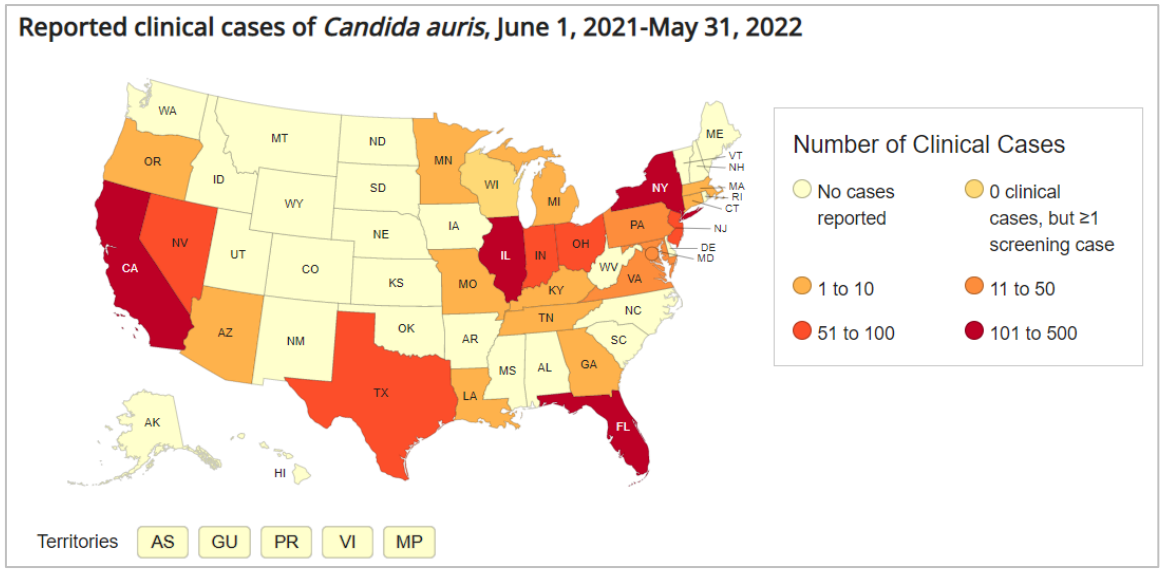
- Some bacteria more difficult to disinfect due to spores, biofilms, or extra outer layers
- Some bacteria are resistant to antibiotics, sometimes ones that used to affect them
  - Methicillin-resistant *Staphylococcus aureus*
  - Gonorrhea

Infectious Agents – Fungi

- Complex cell(s)
  - Most are single cells
- Extremely varied
  - May spread differently
  - Many have person-to-person spread
  - May need different cleaning methods
  - May survive in the environment

Infectious Agents – Fungi

- Some fungi produce spores that are resistant to routine cleaning
- Drug-resistant can develop
  - *Candida auris* in healthcare settings



https://www.cdc.gov/fungal/candida-auris/tracking-c-auris.html

Infectious Agents – Parasites

- Complex cell(s)
  - Range from single cells to worms yards in length
- Extremely varied
  - May spread differently
  - Some have person-to-person spread
  - May need different cleaning methods
  - May survive in the environment

Infectious Agents – Parasites

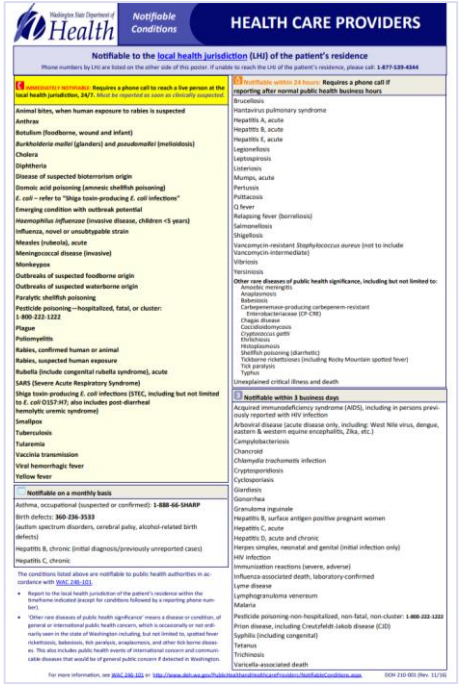
- Parasites or their cysts or spores may tolerate drying, smoking, salting, freezing, or levels of chlorine used for drinking water
- Some parasites are increasingly drug-resistant (head lice)

Agent – Reservoirs

- Reservoirs – where the organism naturally occurs and reproduces (where it come from)
  - People e.g., diphtheria, MRSA
  - Animals including birds e.g., salmonellosis, influenza
  - Water e.g., legionellosis
  - Soil e.g., tetanus

Notifiable Conditions

- Each state (jurisdiction) requires reporting of some conditions
  - Many are listed in all states
  - Some are unique (e.g., in Washington shellfish poisoning)
  - No enforcement of reporting


Health Notifiable Conditions HEALTH CARE PROVIDERS

Notifiable to the local health jurisdiction (LHJ) of the patient's residence

Phone numbers by LHJ are listed on the other side of this poster. If unable to reach the LHJ of the patient's residence, please call: 1-877-539-4344

IMMEDIATELY NOTIFIABLE Requires a phone call to reach a live person at the local health jurisdiction, 24/7. Must be reported as soon as clinically suspected.

Animal bites, when human exposure to rabies is suspected
Anthrax
Botulism (foodborne, wound and infant)
Burkholderia mallei (glanders) and *pseudomallei* (melioidosis)
Cholera
Diphtheria
Disease of suspected bioterrorism origin
Domoic acid poisoning (amnesic shellfish poisoning)
E. coli – refer to "Shiga toxin-producing *E. coli* infections"
Emerging condition with outbreak potential
Haemophilus influenzae (invasive disease, children <5 years)
Influenza, novel or unsubtypable strain
Measles (rubeola), acute
Meningococcal disease (invasive)
Monkeypox
Outbreaks of suspected foodborne origin
Outbreaks of suspected waterborne origin
Paralytic shellfish poisoning
Pesticide poisoning—hospitalized, fatal, or cluster: 1-800-222-1222
Plague
Poliomyelitis
Rabies, confirmed human or animal
Rabies, suspected human exposure
Rubella (include congenital rubella syndrome), acute
SARS (Severe Acute Respiratory Syndrome)
Shiga toxin-producing *E. coli* infections (STEC, including but not limited to *E. coli* O157:H7; also includes post-diarrheal hemolytic uremic syndrome)
Smallpox
Tuberculosis
Tularemia
Vaccinia transmission
Viral hemorrhagic fever
Yellow fever

Notifiable within 24 hours Requires a phone call if reporting after normal public health business hours

Brucellosis
Hantavirus pulmonary syndrome
Hepatitis A, acute
Hepatitis B, acute
Hepatitis E, acute
Legionellosis
Leptospirosis
Listeriosis
Mumps, acute
Pertussis
Psittacosis
Q fever
Relapsing fever (borreliosis)
Salmonellosis
Shigellosis
Vancomycin-resistant *Staphylococcus aureus* (not to include Vancomycin-intermediate)
Vibriosis
Yersiniosis
Other rare diseases of public health significance, including but not limited to:
Amoebic meningitis
Anaplasmosis
Babesiosis
Carbapenemase-producing carbepenem-resistant Enterobacteriaceae (CP-CRE)
Chagas disease
Coccidioidomycosis
Cryptococcus gattii
Ehrlichiosis
Histoplasmosis
Shellfish poisoning (diarrhetic)
Spotted fever rickettsioses (including Rocky Mountain spotted fever)
Tick paralysis
Typhus
Unexplained critical illness and death

Notifiable within 3 business days

Acquired immunodeficiency syndrome (AIDS), including in persons previously reported with HIV infection
Arboviral disease (acute disease only, including: West Nile virus, dengue, eastern & western equine encephalitis, Zika, etc.)
Campylobacteriosis
Chancroid
Chlamydia trachomatis infection
Cryptosporidiosis
Cyclosporiasis
Giardiasis
Gonorrhea
Granuloma inguinale
Hepatitis B, surface antigen positive pregnant women
Hepatitis C, acute
Hepatitis D, acute and chronic
Herpes simplex, neonatal and genital (initial infection only)
HIV infection
Immunization reactions (severe, adverse)
Influenza-associated death, laboratory-confirmed
Lyme disease
Lymphogranuloma venereum
Malaria
Pesticide poisoning-non-hospitalized, non-fatal, non-cluster: 1-800-222-1222
Prion disease, including Creutzfeldt-Jakob disease (CJD)
Syphilis (including congenital)
Tetanus
Trichinosis
Varicella-associated death

Notifiable on a monthly basis

Asthma, occupational (suspected or confirmed): 1-888-66-SHARP
Birth defects: 360-236-3533 (autism spectrum disorders, cerebral palsy, alcohol-related birth defects)
Hepatitis B, chronic (initial diagnosis/previously unreported cases)
Hepatitis C, chronic

The conditions listed above are notifiable to public health authorities in accordance with WAC 246-101

- Report to the local health jurisdiction of the patient's residence within the timeframe indicated (except for conditions followed by a reporting phone number).
- "Other rare diseases of public health significance" means a disease or condition, of general or international public health concern, which is occasionally or not ordinarily seen in the state of Washington including, but not limited to, spotted fever rickettsiosis, babesiosis, tick paralysis, anaplasmosis, and other tick-borne diseases. This also includes public health events of international concern and communicable diseases that would be of general public concern if detected in Washington.

For more information, see WAC 246-101 or http://www.doh.wa.gov/PublicHealthandHealthcareProviders/NotifiableConditions.aspx

DOH 210-001 (Rev. 11/16)

https://doh.wa.gov/public-health-healthcare-providers/notifiable-conditions/how-report-posters

General School Responsibilities: WAC 246-101-420 (January 2023)

- Notify the local health jurisdiction of
  - Cases, outbreaks, and suspected outbreaks of
  - **Notifiable conditions** that may be
  - **Associated with the school**

https://app.leg.wa.gov/WAC/default.aspx?cite=246-101-420&pdf=true

General School Responsibilities: WAC 246-101-420 (January 2023)

- Don't notify of cases just reported to the school (e.g., absenteeism excuse from a parent) unless a concerning condition (e.g., measles, polio)
- Note: Public health doesn't know about a school-associated case without a school report (or parent on Facebook)

https://app.leg.wa.gov/WAC/default.aspx?cite=246-101-420&pdf=true

General School Responsibilities: WAC 246-101-420

- Cooperate with case or outbreak investigations
- Cooperate with influenza surveillance
- Can consult with the local health jurisdiction about control and prevention
- Establish a policy for confidentiality related to health care information

https://app.leg.wa.gov/WAC/default.aspx?cite=246-101-420&pdf=true

General School Responsibilities: WAC 246-110

- Defines: “contact”, “contaminated”, “exposed”, “outbreak”, “school”, “susceptible”, etc.
- Gives examples of contagious diseases

(a) Bacterial Meningitis
(i) Haemophilus influenzae invasive disease (excluding Otitis media)
(ii) Meningococcal
(b) Diarrheal diseases due to or suspected to be caused by an infectious agent
(i) Cryptosporidiosis
(ii) Giardiasis
(iii) Hepatitis A
(iv) Salmonellosis
(v) Shigellosis
(vi) Shiga toxin-producing Escherichia coli (STEC)
(c) Diseases spread through the air - Tuberculosis
(d) Vaccine preventable diseases
(i) Chickenpox (Varicella)
(ii) Diphtheria
(iii) German measles (Rubella)
(iv) Measles (Rubeola)
(v) Mumps

https://app.leg.wa.gov/WAC/default.aspx?cite=246-110

General School Responsibilities – WAC 246-366

- Environmental health and safety
  - Includes food handling (refers to other WAC chapters)

PRIMARY AND SECONDARY SCHOOLS

WAC Sections

HTML	PDF	246-366-001	Introduction.
HTML	PDF	246-366-005	Purpose.
HTML	PDF	246-366-010	Definitions.
HTML	PDF	246-366-020	Substitutions.
HTML	PDF	246-366-030	Site approval.
HTML	PDF	246-366-040	Plan review and inspection of schools.
HTML	PDF	246-366-050	Buildings.
HTML	PDF	246-366-060	Plumbing, water supply and fixtures.
HTML	PDF	246-366-070	Sewage disposal.
HTML	PDF	246-366-080	Ventilation.
HTML	PDF	246-366-090	Heating.
HTML	PDF	246-366-100	Temperature control.
HTML	PDF	246-366-110	Sound control.
HTML	PDF	246-366-120	Lighting.
HTML	PDF	246-366-130	Food handling.
HTML	PDF	246-366-140	Safety.

https://app.leg.wa.gov/WAC/default.aspx?cite=246-366

General School Responsibilities – WAC 246-366A-080

- For animals in school facilities have written policies addressing:
  - Injuries
  - Spread of diseases (e.g., rabies, salmonellosis)
  - Allergic reactions to animals
  - Exposure to animal wastes
  - Handling of animals without proper handwashing

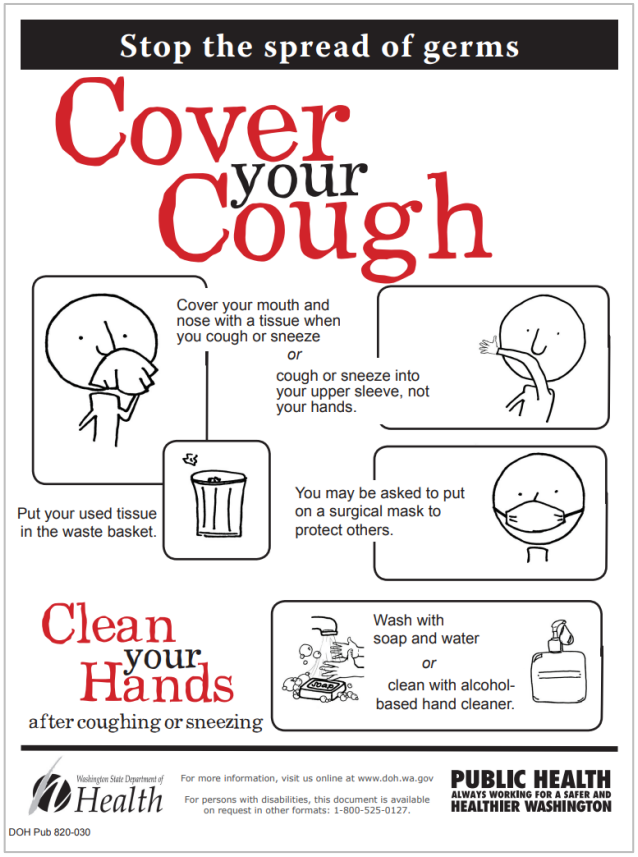
https://app.leg.wa.gov/WAC/default.aspx?cite=246-366A

Infectious Disease Prevention

- General approaches:
  - Avoid exposure
  - Prevent infection if exposed
  - Prevent severe illness if infected

Avoid Exposure (General)

- Respiratory hygiene
- Hand hygiene
- Food safety
- Safe water
- Environmental cleaning
- Screen for symptoms
- Isolate if symptoms (stay home during illness)
- Quarantine if exposed



Prevent Infection if Exposed (General)

- Vaccine if exists
- Post-exposure prophylaxis if exists
  - Antibiotic
  - Antiviral medication
  - Vaccine

Prevent Severe Illness if Infected (General)

- General supportive care (fluids, anti-fever medication, treatment for vomiting or diarrhea)
- Intensive care (ventilation, medications, surgery)
- Specific antimicrobial agent
- Other disease-specific therapy e.g., monoclonal antibodies
- Rehabilitation, accommodation

Prevention – Viruses

- Applicable general approaches (cover coughs, wash hands, stay home)
- Depending on the agent there may be:
  - Vaccines (good ones)
  - Antiviral medication (limited number)

Prevention – Bacteria

- Applicable general approaches (cover coughs, wash hands, stay home)
- Depending on the agent there may be:
  - Vaccines (OK ones)
  - Antibiotics (large number but increasing resistance)

Prevention – Fungi

- Applicable general approaches (good hygiene, don't share towels, etc.)
- Depending on the agent there may be antifungal treatment (but some are drug-resistance)

Prevention – Parasites

- Applicable general approaches (cover coughs, wash hands, stay home)
- Depending on the agent there may be:
  - Malaria vaccine?
  - Antiparasitic medications

Transmission

- The way an agent spreads is key to public health and health interventions
  - Is the original source still a risk to others?
  - Is a case contagious?
  - Are close contacts at risk?

Transmission – Contagiousness

- Look at the number of illnesses in a group exposed to the case that is not immune (e.g., household members)

Transmission (Nontraditional List)

- An agent may spread by one or more routes:
  - Airborne
  - Respiratory droplets
  - Fecal-oral
  - Skin to skin
  - Sexually transmitted
  - Blood, other body fluids
  - Contaminated object, food, water
  - Animal or vector
  - Natural environmental
  - Note: one or more may apply

Respiratory – Airborne (Aerosol)

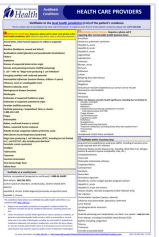
- "Airborne" is a specific term
- Inhale tiny particles (from talking etc.) that remain suspended in the air
- An agent not usually airborne may become airborne by medical procedures
  - Special precautions may be needed
- Highly contagious
  - May be infectious for minutes to hours just by breathing
  - May spread over a distance on air currents

Airborne: Measles

- Viral systemic infection with rash
  - Complications: pneumonia, brain infection
- Preventable with vaccine
- Highly contagious (respiratory)

Example: spread in movie theater

- Isolate the case at home
- Shut clinic examination room for hours after a suspected case leaves
- Identify and quarantine susceptible (unvaccinated) contacts (same room)



Airborne: Chickenpox

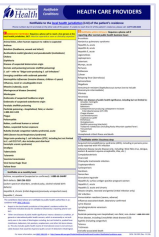
- Viral systemic infection with rash
  - Complications: severe in infants, immunocompromised (e.g., child with leukemia), or during pregnancy; pneumonia; shingles when older or immunocompromised
- Preventable with vaccine
- Highly contagious (respiratory)
  - Isolate the case at home
  - Identify and quarantine susceptible (unvaccinated) contacts (same room)

Respiratory – Droplets

- Droplets are expelled when coughing, sneezing, or talking
  - Droplets fall (estimated 6 feet/2 meters)
- Inhale droplet if nearby (within feet)
  - Touch a contaminated surface and then one's eye, nose, or mouth
- Varying contagiousness
  - Agent may persist on surfaces for minutes to hours

Respiratory Droplets: Pertussis

- Bacterial respiratory infection
  - Complications: pneumonia, seizures, encephalopathy, infant apnea
- Preventable with vaccine
- Contagious through droplets
  - Isolate case, antibiotics for case and contacts
  - Close contacts would include household members, overnight visitors, best friends, sexual partners, play group at school

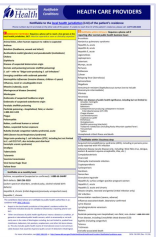


Respiratory Droplets: Influenza

- Viral respiratory infection
  - Complications: pneumonia, seizures
- Preventable with vaccine
- Contagious
  - Annually 10-20% of US population infected
  - Antiviral prophylaxis in healthcare settings or for those at high risk of complications

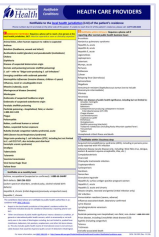
Respiratory Droplets: COVID-19

- Viral respiratory infection
  - Complications: pneumonia, respiratory failure, "long COVID"
- Preventable with vaccine
- Contagious
  - Case – isolate at home
  - Prophylaxis may be appropriate
  - May be airborne in some circumstances including medical procedures
  - Estimated >60% of the US population has had at least one infection



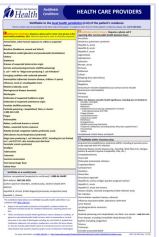
Respiratory Droplets: Meningococcal Disease

- Bacterial infection of throat that can enter blood (meningococcemia) or brain (meningitis)
  - Complications: permanent damage
- Preventable with vaccine (specific groups)
- Somewhat contagious
  - Isolate case
  - Antibiotics for case and contacts (household members, overnight visitors, best friends, sexual partners, play group at school)



Respiratory Droplet: Tuberculosis

- Bacterial lung infection
  - Complications: may damage lung, bones, other organs (consumption)
- Treatable with anti-TB drugs for case and for close contacts
- Somewhat contagious
  - Isolate the case until treated sufficiently
  - Identify close contacts and provide anti-TB prophylaxis



Respiratory Droplets: Strep

- Bacterial infection causing sore throat, skin infections
  - Complications
  - Strep is one cause of impetigo skin infections
- Very contagious
  - Respiratory
  - Skin-to-skin through contaminated surfaces or objects
  - Wash your hands, don't rub your eyes

Respiratory Droplets: HFM Disease

- Viral
  - Complications rare, can be dehydration in infants
- Very contagious
  - Respiratory secretions
  - Rash fluid directly or through contaminated surfaces or objects
  - Feces
  - Wash your hands, don't rub your eyes

Respiratory Droplets: RSV

- Viral
  - Complication of respiratory failure mainly in infants and elderly
- Very contagious
  - Respiratory secretions
  - Contaminated surfaces or objects
  - Most people have been infected by age 2 years
  - Current surge in this country
  - Wash your hands, don't rub your eyes

Fecal-oral

- Somebody's poop gets in somebody else's mouth
  - Direct; through food, water, or object
- Prevention for person with diarrhea or vomiting
  - Stay home until symptoms stop
  - Don't prepare or share food with others
  - Wash hands (and objects including diapering areas)
  - Don't depend on hand gel

Fecal-oral

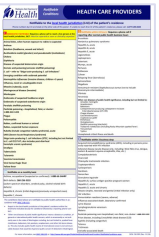
- General prevention
  - Safe food production
  - Safe food preparation
  - Safe water

Fecal-oral: Norovirus

- Viral infection of the intestine with vomiting and diarrhea
  - Complications are rare except in very young and very old (dehydration)
- No vaccine or treatment
- Very contagious – splash from vomit
  - Extended school (or cruise ship) outbreaks
  - Hand gel does not work

Fecal-oral: Hepatitis A

- Viral infection of the liver with jaundice, vomiting, and diarrhea
  - Younger (preschool) children often have no symptoms
  - Complications: rarely fatal
- Preventable with vaccine
- Very contagious (non-visible feces)
  - Vaccine for contacts including household, best friend, sexual partner, childcare attendees and staff, food service clients, etc.

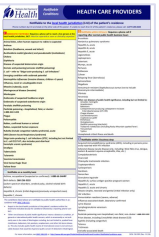


Fecal-oral: Shigellosis

- Bacterial infection of the intestine with diarrhea
  - Complications rare, infants can have dehydration or seizures
- Treatable, no vaccine
- Very contagious (non-visible feces)
  - Symptomatic contacts should not work until tested

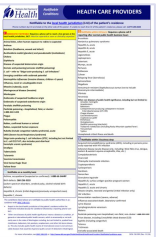
Fecal-oral: Giardiasis, Cryptosporidiosis

- Intestinal parasites with resistant phase
  - Complications rare
  - Come from humans and many animals
- Treatable, no vaccine
- Very contagious (non-visible feces)
  - Direct (childcare settings)
  - Food, water



Fecal-oral: Polio

- Viral infection of the intestine
  - Younger children often no symptoms
  - Complications: rare invasion of the nervous system with limb paralysis
- Vaccine preventable
- Very contagious (non-visible feces)
  - Direct
  - Water, rarely food
  - Recent case in New York of an unvaccinated person without identified exposure



Body Fluid into Mucous Membrane

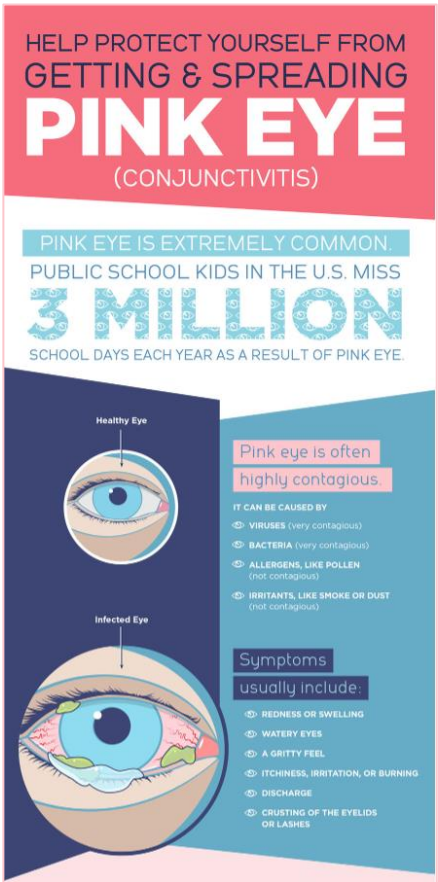
- Body fluid or secretions enter eyes, nose, or mouth
  - Direct (splash or sweat to face); touching contaminated surface and then face, through an object
- Prevention
  - Cover coughs, wash hands, clean surfaces and objects
  - Don't depend on hand gel

Body Fluid into Mucous Membrane: Ebola

- Viral infection present in vomit, diarrhea, sweat, urine, tears, sexual fluids, etc.
  - Complications: dehydration, bleeding
- Contagious
  - Directly
  - Cut from sharp object (medical)
  - Contaminated body or fabrics
  - Almost all cases are due to household, funeral, or healthcare exposures
  - Use hospital-grade disinfectant

Body Fluid into Mucous Membrane: Pink Eye

- Viruses or bacteria in the eye
- Very contagious, often self-infection by rubbing eye
  - Contaminated surfaces
  - Contaminated objects that are shared: microscope eyepiece, eye cosmetics, eye drops, contact lenses, towels, etc.
  - Wash your hands, don't rub your eyes



Skin to Skin

- Skin contact or objects contaminated by skin infection
- Contagious with contact (touching, kissing, sex, wrestling, healthcare) or with shared item (gym mat, cosmetics)
  - Environmental contamination may be an issue

https://www.cdc.gov/mrsa/community/environment/athletic-facilities.html

Skin to Skin: Non-genital Herpes

- Viral infection causing cold sores and sports skin infections
  - Complications: lost school time, lost competition time
- Somewhat treatable, no vaccine
- Contagious
  - Examples: shared lipstick, body contact sport (wrestling)

Skin to Skin: Athlete's Foot, Warts

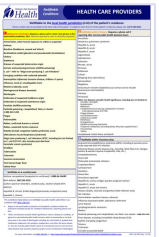
- Fungal and viral infections
- Contagious with skin contact or with contaminated damp environment (e.g., lockers, pool area)
  - Treat cases
  - Routine thorough cleaning (and drying) of surfaces

Skin to Skin: Lice, Scabies

- Parasites of the hair or skin
  - Complications: parents flip out
- Treatable, no vaccine
- Contagious directly; for lice shared items (hats, hair items)
  - Outbreaks of lice common in elementary schools for all economic groups
  - Outbreaks of scabies can occur in institutional settings

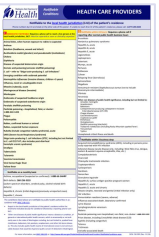
Skin to Skin: Monkeypox

- Viral infection of the skin
  - Complications: severe infection of the eyes, mouth, anogenital area
- Vaccine for those at high risk or for contacts with skin-to-skin exposure
- Contagious directly, fabrics, surfaces, sometimes respiratory secretions
  - Touching, kissing



Sexually Transmitted Diseases

- Transmission by sexual fluids (semen, vaginal fluids); may also be bloodborne
- Specific conditions: HIV, gonorrhea, chlamydia, genital herpes, syphilis, human papillomavirus, trichomoniasis, chancroid, etc.
- Contagious directly by sex or through objects during sex
  - School transmission very rare
  - Vaccines for HPV, hepatitis B

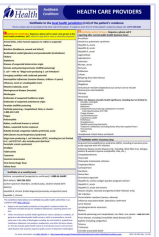


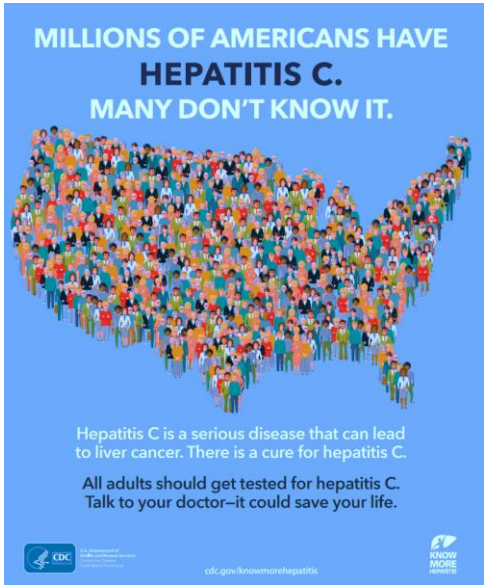
Bloodborne

- Several viral infections spread in the blood to other body organs
  - Complications vary: may be organ damage, immunosuppression
- Contagious mainly through fresh blood, some also be sexually transmitted, rarely through medical procedures
  - School transmission very rare, institutional spread of hepatitis B before vaccine was available

Bloodborne: HIV, Hepatitis B and C

- Viral infections
  - Complications: liver damage for hepatitis B and hepatitis C, immunosuppression for HIV
- Vaccine for hepatitis B, preventive medications for HIV, treatment for hepatitis C





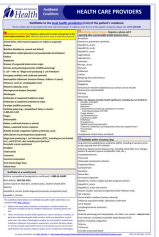
Animal Contact

- Animals carry many infectious agents, particularly in their feces
- Spread by touching animals, bedding, cages, etc. and then eating or putting fingers in the mouth without washing hands
- Bad ideas:
  - Serving snacks next to animal pens
  - Eating food in a petting zoo (particularly caramel corn)

https://app.leg.wa.gov/WAC/default.aspx?cite=246-366A

Animal: Rabies Exposure or Rabies

- Rabies: viral infection of the brain, almost always fatal
- Bats are the only animal carrying rabies in Washington
  - Somebody could bring a rabid animal from another area
- Safely contain (e.g., with a box) any bat that could have had human contact
- Consult the local health jurisdiction


HEALTH CARE PROVIDERS

Environmental

- Bacteria living naturally in the environment
- Contagious by bacteria entering the body
  - Rare events: breathing *Legionella*, tetanus-causing bacteria in a wound