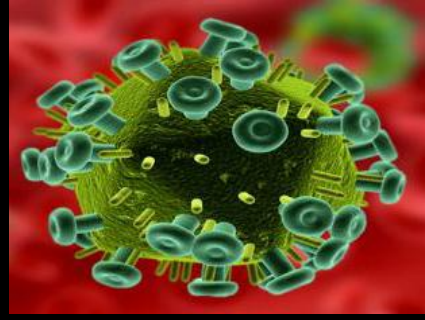
Public Health

BSA Merit Badge



Davis County Health Department

What is Public Health?

"The science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals."

Charles-Edward Amory Winslow -1920

How Are Diseases Spread?

Aerosol/Droplet

Direct Contact

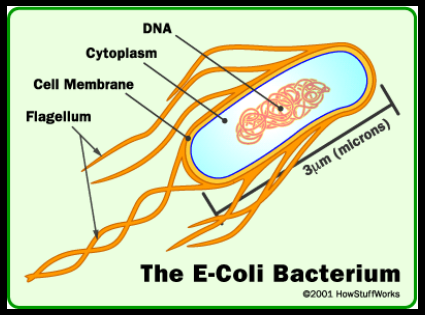
Contaminated Food

Contaminated Water

Vectors

ESCHERICHIA COLI (E. coli)

- Bacteria
- Foodborne



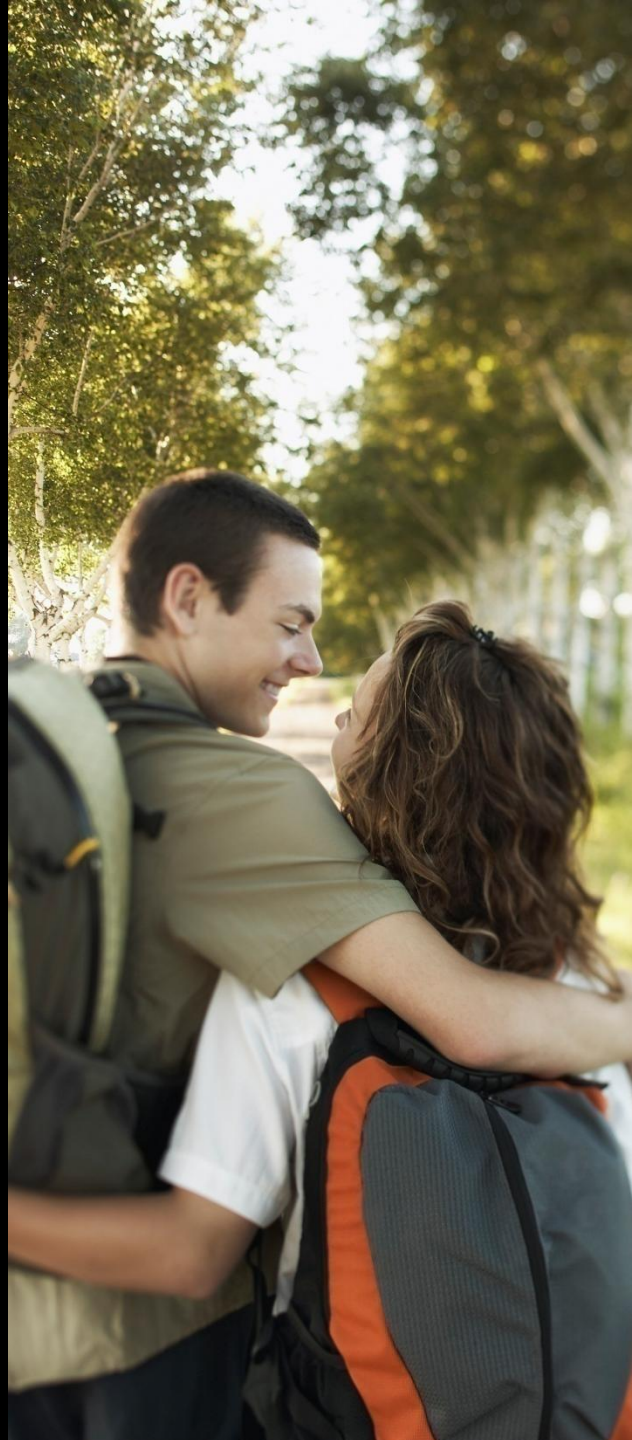
- **Prevention:** use care when preparing foods, keep meats away from foods that won't be cooked, cook ground or tenderized meats to correct temperature
- **Treatment:** supportive care, including hydration
- Kidney failure in 5% - 10% of cases

TETANUS

- Spore forming bacteria
- Enter body through open wound
- Spores survive in soil or animal feces for years
- Causes painful muscle contractions (can't relax)
- Booster shots every 10 years

HIV/AIDS

- Human Immunodeficiency Virus causes Acquired Immunodeficiency Syndrome
- Person-to-person, sexually transmitted, bloodborne pathogen, not through casual contact
- **Prevention:** abstain from sexual activity, safe sex practices, avoid contact with deep body fluids
- **Treatment:** no cure, antiviral treatment slows virus, treatment for opportunistic infections



ENCEPHALITIS

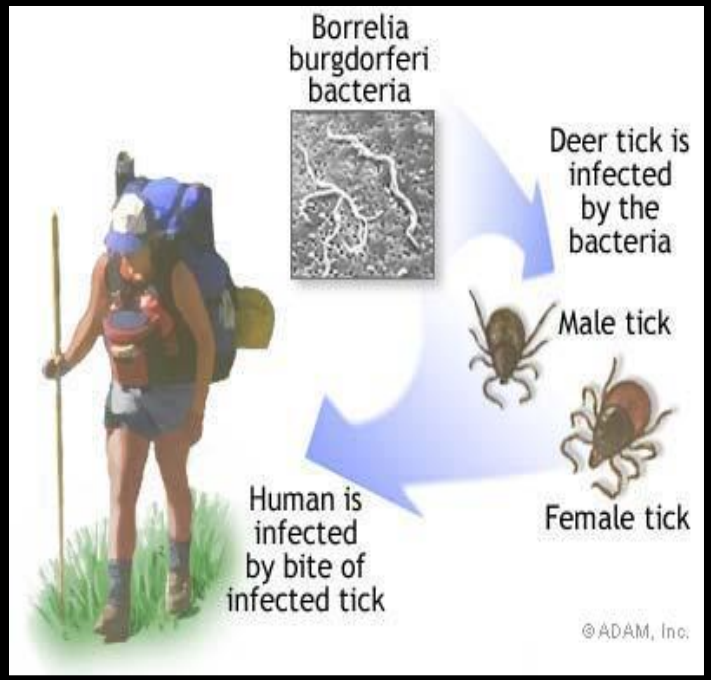
- Bacteria & virus
- **Vectors:** mosquitoes & ticks
- Inflammation of the brain
- **Symptoms:** headache, fever, stiff neck, nausea/vomiting, confusion, even death
- **Prevention:** vector control, some vaccines available, use of tick & mosquito repellents
- **Treatment:** antiviral drugs sometimes work, supportive care, antibiotics for bacterial causes, some have no cure/treatment

SALMONELLOSIS

- Bacteria causes food poisoning
- Carried by some reptiles
- **Symptoms:** vomiting, diarrhea, fever, abdominal pain
- **Prevention:** safe food handling practices, proper cooking and storage, hand washing (before and after food prep and after handing pet rodents, turtles, lizards, etc.)
- **Treatment:** supportive care (incorrect treatment can increase the risk of complications)

LYME DISEASE

- Bacteria
- **Vector:** deer tick
- **Prevention:** take precautions in tick areas, wear light-colored clothing, use insect repellent w/ DEET, check your body for ticks, know how to properly remove a tick if you are bitten, remove the tick ASAP (36 hour rule)
- **Treatment:** may use antibiotics

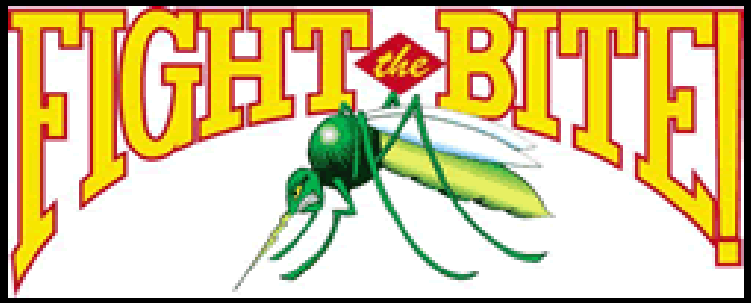


GONORRHEA

- Bacteria
- Person-to-person, sexually transmitted
- **Prevention:** abstain from sexual activity, safe sex practices
- **Treatment:** antibiotics

WEST NILE VIRUS

- **Vector:** mosquito (transmitted from birds)
- **Symptoms:** fever, headache, fatigue, body aches, nausea/vomiting
- 80% no symptoms, 20% West Nile Fever, 1% meningitis or encephalitis
- **Prevention:** eliminate stagnant water sources, use insect repellent
- **Treatment:** no disease treatment, supportive care



BOTULISM

- Bacteria (toxin)
- Usually foodborne, sometimes wound related
- **Prevention:** safe food handling, proper wound care
- **Treatment:** antitoxin, supportive care, antibiotics

INFLUENZA

- Caused by virus (ex. H1N1)
- The Great Pandemic, 1918
  21 million deaths worldwide
- Spread person-to-person by respiratory droplets (coughing, sneezing)
- **Symptoms:** fever, cough, sore throat, body aches, congestion
- **Prevention:** yearly flu shot, cover cough, hand washing
- **Treatment:** antiviral therapies

SYPHILLIS

- Bacteria
- Spread through sexual contact, deep body fluids
- Can be spread from mother to infant during pregnancy and/or birth
- **Prevention:** abstain from sexual activity, safe sex practices
- **Treatment:** antibiotics (penicillin)

HEPATITIS

- Viruses
- Passed through deep body fluids (bloodborne pathogen, fecal/oral)
- Inflammation of the liver
- **Symptoms:** some have none, feeling tired, loss of appetite, nausea, vomiting, jaundice (yellow skin & eyes), liver cancer
- **Prevention:** Hep A/B vaccines, no vaccine for Hep C, avoid dirty needles (drugs, tattoos, piercing), avoid contact with other peoples blood/deep body fluids, proper hygiene and food handling
- **Treatment:** supportive care, antivirals, interferon

EMPHYSEMA

- Air sacs of the lungs are damaged & enlarged causing breathlessness
- Chronic exposure to toxic chemicals, long-term tobacco use
- **Prevention:** no tobacco use, stop smoking, avoid second-hand smoke
- **Treatment:** no cure, supportive care until death, lung transplants

MENINGITIS

- Bacteria & virus
- Inflammation of the lining of the spinal cord or brain
- Spread person-to-person
- **Prevention:** vaccination, isolation, quarantine
- **Treatment:** bacterial - antibiotics, viral - usually self-limiting, supportive care

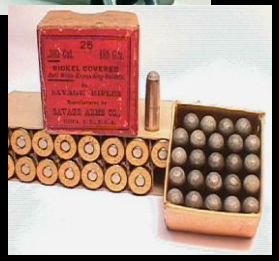
HERPES

- Virus (2 Types)
- Spread through contact with infected areas
- **Symptoms:** burning, itching, painful sores/blisters
- Recurring outbreaks
- Life long infection, no cure
- **Prevention:** avoid skin to skin contact with sores, don't share drinks, lip balm, etc., abstain from sexual activity
- **Treatment:** antiviral can prevent outbreaks and reduce frequency, severity & duration

LEAD POISONING

- Environmental exposure (usually ingestion by infants/toddlers)
- **Prevention:**
  - Identification of "at risk" persons
  - Environmental monitoring
  - Abatement (removal)
- **Treatment:** chelation therapy

Lead Paint



Lead Shot

IMMUNIZATION

- Immunization: process by which an individual's immune system becomes fortified against an agent
- Vaccination is most common immunization technique
- Prepares the body's immune system to fight or prevent an infection

Immunization Schedule Ages 7-18

Recommended Immunization Schedule for Persons Aged 7 Through 18 Years—United States • 2011

For those who fall behind or start late, see the schedule below and the catch-up schedule

Vaccine ▼ Age ▶	7–10 years	11–12 years	13–18 years
Tetanus, Diphtheria, Pertussis[1]		Tdap	Tdap
Human Papillomavirus[2]	see footnote [2]	HPV (3 doses)(females)	HPV Series
Meningococcal[3]	MCV4	MCV4	MCV4
Influenza[4]	Influenza (Yearly)		
Pneumococcal[5]	Pneumococcal		
Hepatitis A[6]	HepA Series		
Hepatitis B[7]	Hep B Series		
Inactivated Poliovirus[8]	IPV Series		
Measles, Mumps, Rubella[9]	MMR Series		
Varicella[10]	Varicella Series		

Range of recommended ages for all children

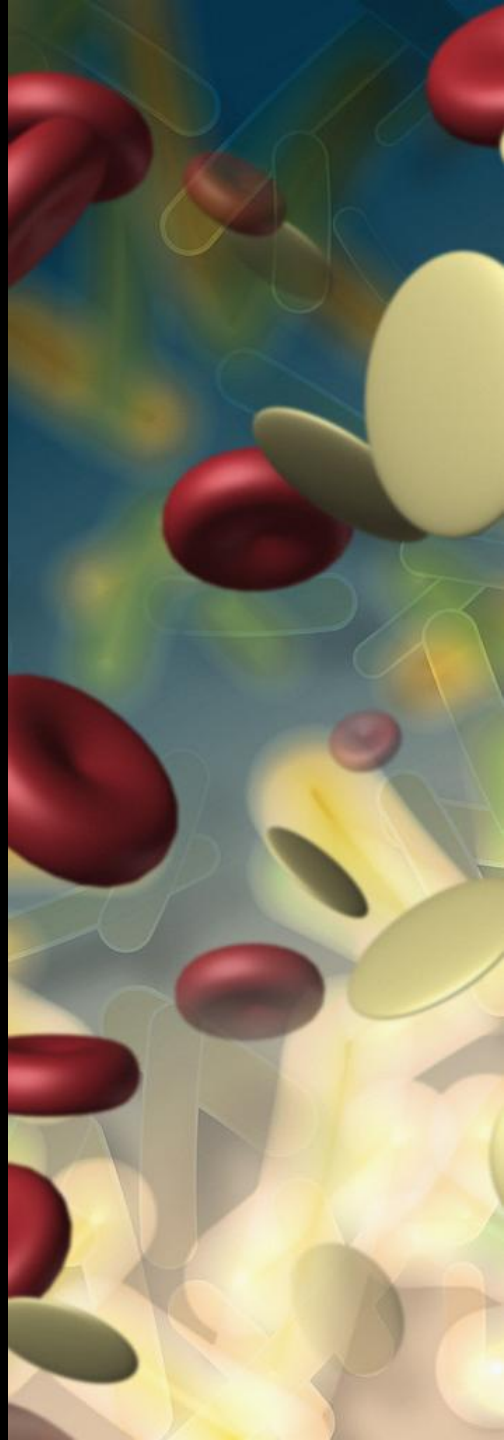
Range of recommended ages for catch-up immunization

Range of recommended ages for certain high-risk groups

PH MB Requirement 2b

NO VACCINE

- Food Poisonings (*E. coli*, *Salmonella*, etc)
- HIV/AIDS
- Encephalitis
- Gonorrhea
- West Nile Virus (available for animals)
- Botulism
- Syphilis
- Emphysema
- Lead Poisoning



SAFE DRINKING WATER

Making Safe Drinking Water at Camp

Common agents of concern found in water:

- **Bacteria – *E. coli, Salmonella***
- **Protozoa – Giardia, Cryptosporidium**
- **Chemical – heavy metals, pesticides**

CHEMICAL TREATMENT

Follow directions for safety. Ineffective against some agents.

BOILING

FILTRATION

DEMONSTRATE 2 WAYS

Filtration / Screening

- Mechanical Filters
- Cheese Cloth

Disinfection

- Boiling - Bring water to a rapid boil for 10 minutes, allow to cool and reaerate by passing it back and forth between containers
- Chemical Treatment - Iodine tablets or chlorine bleach (2 drops/quart if water is clear, 4 drops per quart if water is cloudy and let stand for 30 minutes)

WHAT IS A VECTOR?

A vector is an organism that does not cause disease itself but that transmits infection by conveying pathogens from one host to another, serving as a route of transmission.

Controlling Disease in Your Home & Community

- Proper trash storage and disposal
- Prompt disposal of pet feces
- Eliminate standing water (old tires, poor-draining gutters, natural puddles and pools, etc.)
- Remove debris and weed overgrowth (wood or rock piles, construction debris, etc.)
- Make sure your home or business is well maintained, with no opening for rodents to get inside

Controlling Disease at Camp

- Keep your tent and campsite clean
- Proper food storage (NOT IN YOUR TENT!)
- Proper trash storage and disposal

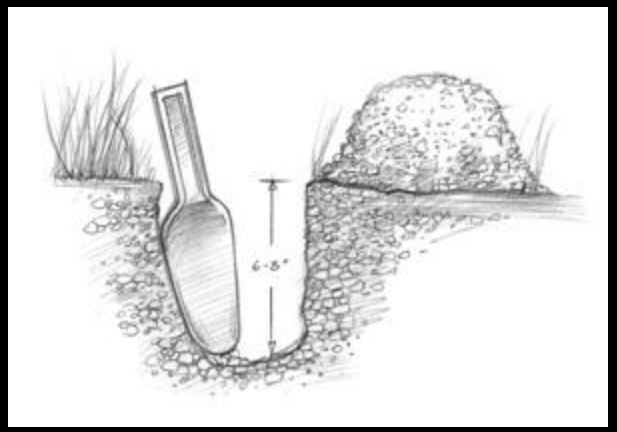
- Leave cabin doors and windows closed to avoid mosquitoes and unwanted animals
- Check body and clothing for ticks

Solid Waste at Camp

- All solid waste should be put in a proper storage container and disposed of according to the law.
- Backpacking - All solid waste should be packed out with you. Do not burn or bury waste.
- Practice LEAVE NO TRACE

Camping/Backpacking Sewage Disposal

- When camping/hiking, use a cathole or latrine to dispose of human waste.
- With a stick, shovel, or heel of your boot, dig a hole 4 to 6 inches deep.
- When finished cover hole with loose soil.
- Choose secluded spots at least 200 feet from water, trails, or campsites.



HAND WASHING

The single most effective method to prevent the spread of disease.

Visit Wastewater Treatment or Solid Waste Management Site

(Not necessary if touring food facility.)

Visit Food Service Facility

(Not necessary if visiting wastewater treatment or solid waste management site.)

PH MB Requirement 5b

Health Dangers from Air Pollution

Pollutants:

- VOCs
- Sulfur Oxides
- Nitrogen Oxides
- Carbon Monoxide/Dioxide
- Particulates
- Toxics/Heavy Metal dusts
- Radioactive gases
- Ozone
- Pathogens

Health Concerns:

- Asthma
- COPD
- Emphysema
- Lung Cancer
- Mesothelioma
- Pneumonia
- Bronchitis
- Allergies
- Legionnaire's disease
- CO poisoning

Health Dangers from Water Pollution

Pollutants:

- Microbes
- Heavy metals
- Pesticides
- Suspended particles
- Organic matter
- Industrial waste
- Disinfection by-products
- Petroleum hydrocarbons

Health Concerns:

- Diarrhea
- Cancer
- Immune suppression
- Poisoning
- Pneumonia
- Birth defects
- Harm to marine life

Health Dangers from Noise Pollution

Pollutants:

- Headphone/Ear bud use
- Industrial
- Transportation
- Shooting sports
- Household

Health Concerns:

- Hearing loss
- Stress
- High blood pressure
- Sleep loss
- Loss of productivity

http://www.epa.gov/air/noise

Tobacco Use

- Responsible for 500,000 deaths/year
- #1 preventable cause of death in the U.S.
- 53,000 deaths/year from secondhand smoke
- Causes more deaths than fires, illegal drug use, homicides, suicides, AIDS, motor vehicle accidents or alcohol combined
- 4,000 chemicals (cancer causing, poisonous gases, radioactive)
- Health effects: yellow teeth, wrinkled skin, decreased oxygen flow, increase in heart rate, addiction, heart disease, cancer, emphysema, death
- Tobacco Industry targets young people to addict them for life
- Tobacco Industry hides and lies about product dangers

Alcohol Use

- Alcohol is the most commonly used and abused drug among youth in the United States
- Excessive alcohol use leads to liver disease and unintentional injuries
- 190,000 emergency rooms visits by underage drinkers (under age 21) for injuries and other conditions linked to alcohol in 2008

Drug Abuse

- Abuse and addiction to alcohol, nicotine, and illegal substances cost Americans more than half a trillion dollars a year ($500,000,000,000)
- Consequences of drug abuse affect people of all ages
- Abuse of illicit drugs and alcohol contributes to the death of more than 100,000 Americans per year
- Medical, economic, criminal, and social impacts

Public Health Agency
Davis County Health Department

Address:
22 South State St.
Clearfield, UT

Phone:
(801) 525-5000

www.daviscountyutah.gov/health

Outline of Agency Services

- Communicable Disease & Epidemiology
- Environmental Health Services
- Family Health & Senior Services
- Vital Records (Birth & Death Certificates)

(Refer to Davis County Health Department Fact Sheet & Organizational Chart)

Communicable Disease & Epidemiology

- Infectious Disease Program
- Sexually Transmitted Disease Program
- Tuberculosis (TB) Program
- Epidemiology
- Role in Disease Outbreaks*
- Public Health Emergency Preparedness *

* PH MB Requirements 7b & 7c

Environmental Health Services

- Air Quality
- Food Service & Facilities
- Waste Management & Environmental Response
- Water Resources
- Disaster Clean Up*

*** PH MB Requirement 7c**

Family Health & Senior Services

- Health Promotion
- Immunization & Travel Clinics
- WIC (Women, Infants & Children)
- Senior Services

4 Leading Causes of Death (Mortality)

Overall:

- Heart Disease
- Cancer (Malignant Neoplasms)
- Stroke (Cerebrovascular Diseases)
- COPD (Chronic Obstructive Pulmonary Disease)

Children 10-14:

- Injuries
- Self Harm
- Birth Defects
- Cancer

Leading Causes of Morbidity (Disease Incidence & Disability)

Chronic Diseases

1. Arthritis
2. High Blood Pressure
3. Heart Disease
4. Respiratory Disease

Infectious Diseases

1. Chlamydia
2. Hepatitis C
3. Latent Tuberculosis (TB)
4. Invasive Streptococcal

Top 20 Diseases, Davis County, 2011		
Disease	**Rank**	**Number of Cases**
Chlamydia	1	739
Hepatitis C, acute & chronic	2	150
Tuberculosis, latent infections (LTBI)	3	66
Streptococcal disease, invasive	4	57
Influenza, hospitalized cases	5	43
Chickenpox (varicella)	6	42
Salmonellosis	7	39
Campylobacteriosis	8	33
Hepatitis B, acute & chronic	9	26
Pertussis	10	25
Giardiasis	11	23
Norovirus	12	20
Cryptosporidiosis	13	19
Gonorrhea	14	18
Shiga toxin producing *E. coli* (STEC)	15	12
Syphilis, all stages	16	11
Legionellosis	17	9
Meningitis, aseptic/viral	17	9
HIV/AIDS	19	4
Haemophilus influenzae, invasive disease	20	3

Hospitalizations

1- Heart Disease

2- Cancer

3- Stroke

4- Pneumonia

Other:

– Mental Illness

– Substance Abuse

Chronic Diseases

- Obesity
- Diabetes
- Heart Disease
- Cancer
- Stroke
- Arthritis
- High Blood Pressure
- High Cholesterol

Healthy Behaviors

- Food & Nutrition
- Physical Activity
- Wear Helmets
- Child Safety Seats
- No Smoking
- No Alcohol
- Adequate Sleep
- Stress Management

Public Health Professionals

- Doctor
- Nurse
- Epidemiologist
- Researcher
- Administrator
- Environmental Scientist
- Laboratory Scientist
- Health Educator
- Dietician
- Social Worker

Public Health Links

- Healthiest Nation in 1 Generation (2 min. video) http://www.youtube.com/watch?v=DuBggj7Zd3A&feature=youtu.be

- Outbreak at Watersedge (interactive game) http://www.mclph.umn.edu/watersedge

Contact Information

Isa Kaluhikaua, MPH, CHES
Communicable Disease Specialist
Davis County Health Department
22 S State Street, Room 2132
Clearfield, Utah 84015
801-525-5212
isa@daviscountyutah.gov