

CH17 – Environmental Hazards & Human Health

Risk Analysis

- Risk analysis
 - involves identifying hazards and evaluating their associated risks (risk _____)
 - ranking risks (comparative risk analysis)
 - determining option and making decisions about reducing or eliminating risks (risk management)
 - informing decision makers and the public about risks (risk _____)

Risk & Hazards

- Risk is the possibility of suffering harm from a hazard that can cause injury, disease, economic loss, or environmental damage.
- Risk is expressed in terms of _____.
- Major types of hazards:
 - _____: poor diet, drugs, driving, assault
 - Chemical: harmful chemicals in the air, water, soil and food
 - Physical: fire, weather, radiation
 - _____: pathogens, allergens and animals

Chemical Hazards

- A toxic chemical is one that can cause temporary or permanent harm or death.
- _____ chemicals are
 - Flammable or explosive
 - Irritating or damaging to the skin or lungs
 - Interfering with oxygen uptake
 - Inducing allergic reactions
- Mutagens cause random mutations in DNA
- _____ promote growth of malignant tumors

Biological Magnification

- One major problem with some chemical hazards, particularly heavy _____ and persistent organic pollutants (POPs) is bioaccumulation and biomagnification.
- Bioaccumulation is an increase in the concentration of a chemical in specific organs or tissues over time.
- Biomagnification is an increase in concentration of chemicals in organisms at successively higher _____ levels

Minamata Disease

- Minamata Disease is not a disease but refers to the neurological effects from _____ poisoning. It was first discovered in 1956 in Minamata, Japan, where methyl mercury from industrial wastewater bioaccumulated in the fish and shellfish that people ate.

Determining Toxicity

- The median lethal dose (_____) is the amount of chemical received in one dose that kills exactly 50% of the subjects in a test population.
- A _____ is a chemical that has an LD₅₀ of 50 mg or less per kilogram of body weight.
- The threshold level of toxicity is the dose below which no toxic effects are observed and/or above which the toxic effects are apparent.

Physical Hazards

- Earthquakes resulting in loss of life and property
- Volcanoes resulting in loss of life and property
- Ionizing Radiation in the form of X-rays, radiation from nuclear sources, and _____ radiation from the sun or sun lamps

Biological Hazards

- Nontransmissible diseases are not caused by living organisms and do not from one person to another
 - diabetes, bronchitis, malnutrition, mesothelioma
- Transmissible diseases are caused by living organisms and can be spread from one person to another. The infectious agent is called a pathogen.
 - tuberculosis, HIV, West Nile, cholera, malaria, dysentery, SARS, MERS, COVID

Seven Deadliest Infectious Diseases

- Number of Deaths Worldwide per year (in millions)
 - 3.2 - _____ and _____
 - 2.1 – HIV/AIDS
 - 1.9 – Diarrheal diseases
 - 1.7 – Tuberculosis
 - 1.0 – Malaria
 - 1.0 – Hepatitis B
 - 0.8 - Measles

Zika!

- The Zika virus, first identified in _____ in 1947, is spread primarily through mosquitoes. Zika can cause birth defects and has no cure, though only one in five infected people die. It has been spreading faster in recent years, with a notable outbreak in 2016, in part due to warming global temperature.

CoronaVirus!

- CoronaVirus (COVID-19) originated from a live animal market in Wuhan, China in December of 2019 and was declared an outbreak of international concern by the World Health Organization by January of 2020. Spreading very easily, COVID-19 has infected more than _____ million people, killing more than _____ in the U.S. and _____ million Worldwide (as of _____).

Leading Causes of Death in the US

- Leading Causes of Death in the US (CDC 2023)
 - #1 – heart disease
 - #2 – cancer
 - #3 – covid
 - #4 – accidents (falls/vehicles)
 - #5 – respiratory disease

Epidemiological Transition

- As a country industrializes, it usually makes an epidemiological transition, where chronic diseases overtake childhood infectious diseases in mortality
 - Phase one is characterized by extremely high death rates with peaks due to _____, famines, and wars
 - Phase two is characterized by less frequent epidemic peaks and a dropping death rate due to _____ advances
 - Phase three is characterized by a leveling off of death rate with most death occurring from _____ diseases associated with aging
 - Phase four continues with a level death rate and shows an increasing average life span due to medical advances
 - Phase five shows an increase in death rate due to the reemergence of new infectious diseases due to urbanization and the overuse of antibiotics and pesticides