Environmental Health

Environmental Health is defined as that aspect of public health that concerned with those forms of life, substances & conditions in the surrounding of man that may exert & influence on human health & wellbeing therefore our aims are pure water, pure food, clean Air & good household condition.

Environmental Hazard Refer to an environmental agent that has the potential to be hazardous or cause adverse health effects, chemical agents are responsible for causing the majority of environmental hazard. A risk is defined as the probability that an event will occur e.g. that an individual will become ill or die within a stated period of time. A hazard results in a risk if there has been exposure.

TYPES OF ENVIRONMENTAL HEALTH HAZARD:

Environmental Hazard arises both naturally & anthropogenic (human – made) sources. Examples:

Chemical:	**Physical**:	**Biological**:	**Psychosocial**:	**Mechanical**:
• Heavy metals • Pesticides • Solvents • Chlorinated hydrocarbons • Poly aromatic hydrocarbons	• Ionizing radiation • Non – Ionizing radiation • Noise • Vibration • Temperature	• Bacteria • Viruses • Fungi • Allergens • Toxins • Venoms	• Personal • Family • Co –workers	• General (accidents) • Cumulative(carpal tunnel syndrome)

On a global scale, environmental factors including over -crowding, migration, poor sanitation and the broad use of pesticides intimately involved in the transmission of infectious agent have bad or profound effect on the occurrence of diseases. When infectious diseases are reduced (by good preventive measures like vaccination), others Environmental. Factors causing human diseases (e.g. chemical, Ionizing radiation, physical) become increasingly important as determinant of ill health.

How to study Environmental health hazard:

1. Nature of the hazard: Biological, chemical, physical, mechanical or social.
2. Route of exposure through air, water, land: e.g. Indoor pollution versus outdoor. Ground water versus surface water versus drinking water.
3. Setting where the hazard occurs: e.g. Home, work, School, Hospital.

Biological hazard: Include all forms of life that can cause adverse health effects, these hazards are plants, Insects, Rodents & other animals, fungi, bacteria, viruses & a wide variety of toxins & allergens. Micro-organism of concern in Environmental health includes bacteria, viruses & protozoa such as amoeba. Most micro –organism & parasite that cause human illness need to grow inside the human body to cause it harm, Bacteria & protozoa may live & multiply outside other living cells & they can survive & multiply for long period in food items or water. Viruses cannot multiply outside of other living cells, although some can survive for long period & remain infectious. To sustain their life cycle viruses need to enter either human cells or the cells of an animals insect or plant. Many diseases caused by micro –org are spread directly from one person to another, these diseases considerer person to person environmental health hazard include TB (which is greatly increased by poor housing & crowded condition) & many infectious childhood diseases. The five infectious killers in the world are acute respiratory infection, Diarrhea, TB, Malaria & Measles. When a disease can spread from one person to another it is called an infectious or communicable disease.

Mode of Transmission of Biological Agents:

1. Water Borne diseases: Water polluted by human excreta e.g. cholera, Typhoid fever.
2. Air Borne diseases; overcrowding, poorly ventilated housing (TB, measles, Influenza)
3. Vector Borne diseases: animal or insect that carry the micro-org or parasite and infect a person via a bite e.g. Malaria via Mosquito, Hemorrhagic fever via ticks.
4. Direct contact ( ) Infected person & healthy. E.g. Sexually transmitted diseases (STD): Syphilis, Gonorrhea, HIV

Chemical Hazard: There is virtually no sector of human activity that does not use chemical products & these products have indeed created many benefits for society such as the treatment of diseases with pharmaceutical products & the use of fertilizers to increase food production. All chemical are toxic to some degree with health risk being primarily a function of the severity of the toxicity and the extent of exposure, however most chemical have not been adequate tested to determine these toxicity. The toxicity of a substance is defined as inherent capacity to cause injury to a living org, (i.e. person, animal or plant).

Thus to identify chemical hazard need to know the following:

1. Their physical & chemical properties.
2. Their route of entry.
3. Their distribution & metabolism.
4. The effects they have on body system

Chemical classification:

1. Inorganic chemicals (contain non or very few carbon atoms) e.g. Fluorine, chlorine, ammonia, ozone & nitrogen oxides.
2. Organic chemicals (structure based on carbon atoms) e.g. Hydrocarbons, Methane & ethane

Major pattern of health effect of chemicals:

1. Systemic toxicity: toxic effect result from absorption of chemicals & it's spreading to different system.
2. Organ – specific toxicity: certain chemicals have target organ specificity.
3. Liver toxicity: most chemicals are metabolized in the liver, organic solvent (ethanol) & certain trace metal (Copper, Cadmium) may cause extensive liver damage.
4. Kidney toxicity: Metals (Mercury, Lead).
5. Skin toxicity: Skin rashes are a common reaction to chemicals.
6. Neurotoxicity: Most toxic substances act on central or peripheral nervous system e.g. organophosphorous. Chlorinated organic compound.
7. Immunotoxicity: function of immune system
    a. Non – specific defense mechanism against agents with no previous sensitization has occurred
    b. Specific adaptive mechanism directed against specific agents to which the organism has previously been sensitized or with which it has been infected.

Physical hazards: are forms of potentially harmful energy in the environment that can result in either immediate or gradually acquired damage when transferred in sufficient quantities to exposed individuals, physical hazard may arise from form of energy that occur naturally or are anthropogenic (Man – Made). A variety of different energy types can pose physical hazard e.g sound waves, radiation, thermal energy & electrical energy. The release of physical energy may be sudden & uncontrolled as in an explosive. Loud noise or sustained as in working condition with long term exposure to lower levels of constant noise. Noise, Radiation (including light) & temperature factors are the most common examples of physical hazard, they can cause health effects in natural exposure situation such as when ultraviolet radiation from the sun causes eye cataract or when heat waves kill the frail, the young & the elderly. Human made exposure situation are of the greatest importance such as the loud – noise that millions of people are exposed to in the work place. Other examples include the ionizing radiation isotopes spreading from the accident at the nuclear power plant.