

Tools of public health

1- Epidemiology

2- Biostatistics

3-Social science

4-principles of administration

5- preventive medicine.

Epidemiology

Epidemiology is the study of the determinants, distribution, and frequency of disease (who gets the disease and why

The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to control of health problems.

Biostatistics

is a branch of biological science which deals with the study and methods of collection, presentation, analysis and interpretation of data of biological research.

Biostatistics is the term used when tools of statistics are applied to the data that is derived from biological sciences such as medicine.

Principles of Administration

Basic Functions of Administration:

Planning.

Organization.

Direction.

Control.

Primary prevention

Primary prevention aims to prevent disease or injury before it ever occurs. This is done by preventing exposures to hazards that cause disease or injury, altering unhealthy or unsafe behaviors that can lead to disease or injury, and increasing resistance to disease or injury should exposure occur. Examples include:

- education about healthy and safe habits (e.g. eating well, exercising regularly, not smoking)
- immunization against infectious diseases

Secondary prevention

Secondary prevention aims to reduce the impact of a disease or injury that has already occurred. This is done by detecting and treating disease or injury as soon as possible to halt or slow its progress, encouraging personal strategies to prevent reinjures or recurrence, and implementing programs to return people to their original health and function to prevent long-term problems. Examples include:

- regular exams and screening tests to detect disease in its earliest stages (e.g. mammograms to detect breast cancer)
- daily, low-dose aspirins and/or diet and exercise programs to prevent further heart attacks or strokes
- suitably modified work so injured or ill workers can return safely to their jobs.

Tertiary prevention:

Tertiary prevention aims to soften the impact of an ongoing illness or injury that has lasting effects. This is done by helping people manage long-term, often-complex health problems and injuries (e.g. chronic diseases, permanent impairments) in order to improve as much as possible their ability to function, their quality of life and their life expectancy. Examples include:

- cardiac or stroke rehabilitation programs, chronic disease management programs (e.g. for diabetes, arthritis, depression, etc.)
- support groups that allow members to share strategies for living well

- vocational rehabilitation programs to retrain workers for new jobs when they have recovered as much as possible.

Statistics divided into:

A. Descriptive statistics: a field of study concerned with methods & procedures of collection, organization, classification, and summarization, giving only descriptive data.

B. Analytic statistics: it is concerned with analysis & drawing of inferences & making a conclusion.

VARIABLE: it is a characteristic that take different values in different persons, places, times, or occasions, e.g. age, height, blood urea, weight, etc. types:

. Quantitative: that can be measured in the usual sense (i.e. we can measure it), e.g. age, height, blood urea & it can be subdivided into:

a. Discrete: characterized by gaps or interruptions in the value that can assumed (i.e. can't assume fraction like 2.3 persons).

b. Continuous: not have gaps or interruption, e.g. S.cholesterol & weight (i.e. we can say 25.8 kg in weight).

Qualitative: that which can't be measured in usual sense but we can describe them & measure them in categories, e.g. eye colors & socio-economic status.

SCALES used to measure variables

1. Nominal scale: use names, numbers or other symbols, each measurement is assigned to limited numbers of unordered categories &

fall in only one category (i.e. when the information of an individual put the individual in one category only, e.g. eye colors & blood groups).

2. Ordinal scale: each measurement is assigned to one of a limited number of categories that are ranked in a graded order. Differences among categories are not necessary to be equal & often not measurable. This scale is used when there are degrees in the variables so we can put them upon each other in the scale, e.g. if the variable is the damaged caused by cancer, we can put it in categories according the degree of that damage to body systems e.g mild ,moderate ,severe .

3. Interval scale: each measurement is assigned to one of unlimited number of categories that are equally spaced with no true zero point, i.e. it does not begin from zero due to the presence of minus numbers, e.g. temperature.

4. Ratio scale: measurement begins at true zero point & the scale has equal intervals, as in height.

There are five types of sampling: Random, Systematic, Convenience, Cluster, and Stratified.

Simple random sampling. In this case each individual is chosen entirely by chance and each member of the population has an equal chance, or probability, of being selected. ...

Systematic sampling. ...

Stratified sampling. ...

Clustered sampling. ...

Convenience sampling. ...

Systematic sampling is easier to do than random sampling. In systematic sampling, the list of elements is "counted off". That is, every 4th element is taken. This is similar to lining everyone up and numbering off "1, 2, 3,

4; 1, 2, 3, 4; etc.” When done numbering, all people numbered 4 would be used.

Convenience sampling is very easy to do, but it's probably the worst technique to use. In convenience sampling, readily available data is used. That is, the first people the surveyor runs into.

Cluster sampling is accomplished by dividing the population into groups -- usually geographically. These groups are called clusters or blocks. The clusters are randomly selected, and each element in the selected clusters are used.

Stratified sampling also divides the population into groups called strata. However, this time it is by some characteristic, not geographically. For instance, the population might be separated into males and females. A sample is taken from each of these strata using either random, systematic, or convenience sampling.

Random sampling is analogous to putting everyone's name into a hat and drawing out several names. Each element in the population has an equal chance of occurring. While this is the preferred way of sampling, it is often difficult to do. It requires that a complete list of every element in the population be obtained. Computer generated lists are often used with random sampling. You can generate random numbers using the calculator.

Levels of Measurement

There are four levels of measurement: Nominal, Ordinal, Interval, and Ratio. These go from lowest level to highest level. Data is classified according to the highest level which it fits. Each additional level adds something the previous level didn't have.

Nominal is the lowest level. Only names are meaningful here.

Ordinal adds an order to the names.

Interval adds meaningful differences

Ratio adds a zero so that ratios are meaningful.

Five Common Types of Sampling Errors

Population Specification Error—this error occurs when the researcher does not understand who they should survey. For example, imagine a survey about breakfast cereal consumption. Who to survey? It might be the entire family, the mother, or the children. The mother might make the purchase decision, but the children influence her choice.

Sample Frame Error—a frame error occurs when the wrong sub-population is used to select a sample.

Selection Error—this occurs when respondents self-select their participation in the study – only those that are interested respond. Selection error can be controlled by going extra lengths to get participation.

Non-Response—Non-response errors occur when respondents are different than those who do not respond. This may occur because either the potential respondent was not contacted or they refused to respond. The extent of this non-response error can be checked through follow-up surveys using alternate modes.

Sampling Errors—these errors occur because of variation in the number or representativeness of the sample that responds or small sample size.

Sampling errors can be controlled by

- (1) careful sample designs,
- (2) large samples, and
- (3) multiple contacts to assure representative response.

Non sampling errors

Observational errors

Processing errors in statistical analysis.

The objectives of epidemiology include the following:

To identify the etiology or cause of disease.

To determine the extent of disease.

To study the progression of disease.

To evaluate preventive and therapeutic measures for a disease or condition.

To develop public health policy.

Basic measurements in epidemiology:

The morbidity rate is the frequency or proportion with which a disease appears in a population.

Sources of morbidity data:

1. Hospital records;

Advantages: give demographic characteristics (age, gender,)

Given the nature of illness (clinical features, investigations...)

Limitations: hospital cases represent the tip of the iceberg.

Hospital records are not designed for research purposes.

2. Others: private and public clinics, insurance companies, prison records...

Types of morbidity rates

INCIDENCE RATE (Absolute Risk): is the rate of new cases occurrence (X) among population at risk (Y) in a specified time period. It measure population at risk during the same time

$$I = [X / Y] \cdot K$$

USES:

- identify population at risk
- In researches to study disease etiology (to detect etiologic agents that cause the disease)
- In planning for preventive measures; as to prepare resources to combat events those occur in short periods and non-lasting for a long time (measles, meningitis...)

PREVALENCE (P) RATE: the rate of all cases (new and old) of an illness in a population at risk in a time period, and this period

Mortality rate, or death rate is a measure of the number of deaths (in general, or due to a specific cause) in a particular population, scaled to the size of that population, per unit of time. Mortality rate is typically expressed in units of deaths per 1,000 individuals per year.

2. Represent the population at risk with a time unit or interval; then it is a RATE, as in:

Incidence = new cases / population at risk in time interval

Prevalence = (new + old cases) / population at risk in time interval

Case Fatality Rate = [deaths / total cases] * 100

Observational studies have two components,

Descriptive and analytical.

Descriptive observations pertain to the "who, what, where and when of health-related state occurrence". However, analytical observations deal more with the 'how' of a health-related event such as

Cross-sectional study

Longitudinal study

Analytical study such as

Case control study

Cohort study

Ecological studies (correlational study)

B-experimental (a term often equated with clinical or community trials of treatments and other interventions).

Experimental epidemiology contains three case types:

Randomized controlled trials (often used for new medicine or drug testing)

Field trials (conducted on those at a high risk of contracting a disease), and

Community trials (research on social originating

Communicable diseases are illnesses caused by viruses or bacteria that people spread to one another through contact with contaminated surfaces, bodily fluids, blood products, insect bites, or through the air. There are many examples of communicable diseases.

Rotavirus

Rotavirus is the most frequent cause of diarrhea in young children and infants and it is responsible for the most severe cases.

There is a vaccine for rotavirus, but globally it causes more than ½ million deaths per year in children less than five years old.

Salmonella and Shigella

Salmonella and Shigella are food-borne GI illnesses. Salmonella is common and is found in raw meats, poultry, seafood and eggs, as well as milk and dairy products. Acute symptoms include nausea, vomiting, abdominal cramps, diarrhea, fever, and headache. Shigella is frequently found in water polluted with human feces. Symptoms of shigellosis (bacillary dysentery) include abdominal pain, cramps, diarrhea, fever, vomiting, and blood, pus, or mucus in stool.

Typhoid Fever

Certain serotypes of *S. enteric*, primarily serotype Typhi (*S. typhi*) but also Paratyphi, cause a more severe type of salmonellosis called typhoid fever. This serious illness, which has an untreated mortality rate of 10%, causes high fever, body aches, headache, nausea, lethargy, and a possible rash.

S. typhi penetrate the intestinal mucosa, grow within the macrophages, and are transported through the body, most notably to the liver and gallbladder. Eventually, the macrophages lyse, releasing *S. typhi* into the bloodstream and lymphatic system. Mortality can result from ulceration and perforation of the intestine. A wide range of complications, such as pneumonia and jaundice, can occur with disseminated disease.

Clinical examination and culture are used to make the diagnosis. The bacteria can be cultured from feces, urine, blood, or bone marrow. Serology, including ELISA, is used to identify the most pathogenic strains, but confirmation with DNA testing or culture is needed.

Cholera

The gastrointestinal disease cholera is a serious infection often associated with poor sanitation, especially following natural disasters, because it is spread through contaminated water and food that has not been heated to temperatures high enough to kill the bacteria. It is caused by *Vibrio cholera* serotype O1, a gram-negative, flagellated bacterium in the shape of a curved rod (vibrio). According to the CDC, cholera causes an estimated 3 to 5 million cases and 100,000 deaths each year

Because *V. cholera* is killed by stomach acid, relatively large doses are needed for a few microbial cells to survive to reach the intestines and cause infection. This increase in osmotic pressure in the lumen leads to water also entering the lumen. As the water and electrolytes leave the body, it causes rapid dehydration and electrolyte imbalance.

Diarrhea is so profuse that it is often called “rice water stool,” and patients are placed on cots with a hole in them to monitor the fluid loss. Cholera is diagnosed by taking a stool sample and culturing for *Vibrio*.

Cholera may be self-limiting and treatment involves rehydration and electrolyte replenishment. Although antibiotics are not typically needed, they can be used for severe or disseminated disease.

Tetracycline are recommended, but doxycycline, erythromycin, ofloxacin, ciprofloxacin, and TMP/SMZ may be used. Recent evidence suggests that azithromycin is also a good first-line antibiotic. Good sanitation—including appropriate sewage treatment, clean supplies for cooking, and purified

Candidiasis

Is an infection caused by a fungus called *Candida*; most commonly the *Candida albicans* variety. The *Candida* infection (also known as a yeast infection) usually affects the skin and/or the mucous membranes of the mouth, intestines, or the vagina.

Candidiasis describes a group of fungal infections involving the skin and mucous membranes. Infection is caused by *Candida* species, primarily *Candida albicans*.

Some circumstances, such as taking a long course of antibiotics or having a weakened immune system can increase your risk of developing a *Candida* infection. The most common *Candida* infections, such as vaginal and skin infections, are localized and can be treated with antifungal drugs.

However, the most common symptoms of invasive candidiasis are fever and chills that don't improve after antibiotic treatment for suspected bacterial infections. Other symptoms can develop if the infection spreads to other parts of the body, such as the heart, brain, eyes, bones, or joints.

Chickenpox

Is caused by the varicella-zoster virus (human herpes virus type 3); chickenpox is the acute invasive phase of the infection, and herpes zoster (shingles) represents reactivation of the latent phase.

Chickenpox, which is extremely contagious, is spread by

Mucosal (usually nasopharyngeal) inoculation via infected airborne droplets or aerosolized particles

Direct contact with the virus (e.g., via skin lesions)

Chickenpox is most communicable during the prodromal and early stages of the eruption. It is communicable from 48 hours before the first skin lesions appear until the final lesions have crusted. Indirect transmission (by carriers who are immune) does not occur.

Chickenpox is rarely severe. In adults and immunocompromised children, infection can often be serious

Mild headache, moderate fever, and malaise may occur 7 to 21 days after exposure, about 24 to 36 hours before lesions appear. This prodromal is more likely in patients > 10 years and is usually more severe in adults.

Lesions evolve from macules to papules and vesicles, which then crust. A hallmark of chickenpox is that lesions develop in crops so that they are in various stages of development in any affected region. The eruption may be generalized (in severe cases) involving the trunk, extremities, and face, or more limited but almost always involves the upper trunk.

Ulcerated lesions may develop on the mucous membranes, including the oropharynx and upper respiratory tract, palpebral conjunctiva, and rectal and vaginal mucosa.

In the mouth, vesicles rupture immediately, are indistinguishable from those of herpetic gingivostomatitis, and often cause pain during swallowing.

Scalp lesions may result in tender, enlarged sub occipital and posterior cervical lymph nodes.

New lesions usually cease to appear by the 5th day, and the majority are crusted by the 6th day; most crusts disappear < 20 days after onset.

Reye syndrome, a rare but severe childhood complication, may begin 3 to 8 days after onset of the rash primarily following the use of aspirin.

Treatment

Symptomatic treatment

Valacyclovir or famciclovir for patient's ≥ 12 years

IV acyclovir for immunocompromised patients and others at risk of severe disease

Mild cases of chickenpox in children require only symptomatic treatment. Relief of itching and prevention of scratching, which predisposes to secondary bacterial infection, may be difficult. Wet compresses or, for severe itching, systemic antihistamines and colloidal oatmeal baths may help.

To prevent secondary bacterial infection, patients should bathe regularly and keep their underclothing and hands clean and their nails clipped. Antiseptics should not be applied unless lesions become infected; bacterial superinfection is treated with antibiotics.

Patients should not return to school or work until the final lesions have crusted.

Herpes simplex

infection of either the skin or the genitalia caused by either of two strains of herpes simplex virus. Herpes simplex virus type 1 (HSV-1) is transmitted orally and is responsible for cold sores and fever blisters, typically occurring around the mouth, whereas herpes simplex virus type 2 (HSV-2) is transmitted sexually and is the main cause of the condition known as genital herpes.

Anyone can be infected with HSV, regardless of age. Your risk is based almost entirely on exposure to the infection.

In cases of sexually transmitted HSV, people are more at risk when they have sex not protected by condoms or other barrier methods.

Other risk factors for HSV-2 include:

Having multiple sex partners

Having sex at a younger age

Being female

Having another sexually transmitted infection (STI)

Having a weakened immune system

If a pregnant woman is having an outbreak of genital herpes at the time of childbirth, it can expose the baby to both types of HSV, and may put them at risk for serious complications.

Some of the symptoms associated with this virus include:

Blistering sores (in the mouth or on the genitals)

Pain during urination (genital herpes)

Itching

You may also experience symptoms that are similar to the flu. These symptoms can include:

Fever

Swollen lymph nodes

Headaches

Tiredness

Lack of appetite

HSV can also spread to the eyes, causing a condition called herpes keratitis. This can cause symptoms such as eye pain, discharge, and a gritty feeling in the eye.

Blood tests for antibodies to HSV-1 and HSV-2 can also help diagnose these infections. This is especially helpful when there are no sores present.

Malaria (protozoan): Anopheles species of mosquito.

Lymphatic filariasis (nematode worm): Culex, Anopheles, Aedes species of mosquito.

Dengue (virus): Aedes species of mosquito.

Leishmaniasis (protozoan): mainly Phlebotomus species of sandfly.

Vector-borne diseases occur primarily in tropical and subtropical regions
Vector-Borne Disease: Disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas. Examples of vector-borne diseases include Dengue fever, West Nile Virus, Lyme disease, and malaria.

They may affect human health directly or indirectly.

Directly, humans are affected by bites, stings, myiasis, and other mechanisms; indirectly, they are affected through disease transmission. However, one must be careful

Malaria is caused by Plasmodium parasites. The parasites are spread to people through the bites of infected female Anopheles mosquitoes, called "malaria vectors." There are 5 parasite species that cause malaria in humans, and 2 of these species – P. falciparum and P. vivax – pose the greatest threat

Five species of Plasmodium (single-celled parasites) can infect humans and cause illness:

Plasmodium falciparum (or P. falciparum)

Plasmodium malariae (or P. malariae)

Plasmodium vivax (or P. vivax)

Plasmodium ovale (or P. ovale)

Plasmodium knowlesi (or P. knowlesi)

The disease is widespread in the tropical and subtropical regions that exist in a broad band around the equator. This includes much of sub-Saharan Africa, Asia, and Latin America. Malaria is commonly associated with poverty and has a significant negative effect on economic development.

Malaria is a serious and sometimes fatal disease caused by a parasite that commonly infects a certain type of mosquito which feeds on humans. People who get malaria are typically very sick with high fevers, shaking chills, and flu-like illness. Four kinds of malaria parasites infect humans: Plasmodium falciparum, P.

malaria is caused by single-celled microorganisms of the Plasmodium group. The disease is most commonly spread by an infected female Anopheles mosquito. The mosquito bite introduces the parasites from the mosquito's saliva into a person's blood. The parasites travel to the liver where

Mature and reproduce. Five species of Plasmodium can infect and be spread by humans. Most deaths are caused by *P. falciparum*, whereas *P. vivax*, *P. ovale*, and *P. malariae* generally cause a milder form of malaria.

The signs and symptoms of malaria typically begin 8–25 days following infection, but may occur later in those who have taken antimalarial medications as prevention. Initial manifestations of the disease—common to all malaria species—are similar to flu-like symptoms and can resemble other conditions such as sepsis, gastroenteritis, and viral diseases. The presentation may include headache, fever, shivering, joint pain, vomiting, and hemolytic anemia, and jaundice, hemoglobin in the urine, retinal damage, and convulsions.

Severe malaria is usually caused by *P. falciparum* (often referred to as falciparum malaria). Symptoms of

falciparum malaria arise 9–30 days after infection. Individuals with cerebral malaria frequently exhibit neurological symptoms, including abnormal posturing, nystagmus, conjugate gaze palsy (failure of the eyes to turn together in the same direction), opisthotonus, seizures,

Other complications of a severe case of malaria can include:

Breathing problems (such as fluid in your lungs)

Liver failure and jaundice (a yellow discoloration of the skin)

Shock (sudden drop in blood flow)

Spontaneous bleeding.

Abnormally low blood sugar.

Kidney failure.

Swelling and rupturing of the spleen.

Dehydration.

Malaria is typically diagnosed by the microscopic examination of blood using blood films, or with antigen-based rapid diagnostic tests. Methods that use the polymerase chain reaction to detect the parasite's DNA have been developed, but are not widely used in areas where malaria is common due to their cost and complexity.

The common cold

, also known simply as a cold, is a viral infectious disease of the upper respiratory tract that primarily affects the nose. The throat, sinuses, and larynx may also be affected. Signs and symptoms may appear less than two days after exposure to the virus. These may include coughing, sore throat, runny nose, sneezing, headache, and fever. People usually recover in seven to ten days, but some symptoms may last up to three

weeks Occasionally, those with other health problems may develop pneumonia

Well over 200 virus strains are implicated in causing the common cold, with rhinoviruses being the most common They spread through the air during close contact with infected people or indirectly through contact with objects in the environment, followed by transfer to the mouth or nose Risk factors include going to child care facilities, not sleeping well, and psychological stress The symptoms are mostly due to the body's immune response to the infection rather than to tissue destruction by the viruses themselves The symptoms of influenza are similar to those of a cold, although usually more severe and less likely to include a runny nose

There is no vaccine for the common cold The primary methods of prevention are hand washing; not touching the eyes, nose or mouth with unwashed hands; and staying away from sick people Some evidence supports the use of face masks There is also no cure, but the symptoms can be treated. Zinc may reduce the duration and severity of symptoms if started shortly after the onset of symptoms No steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen may help with pain Antibiotics, however, should not be used, as all colds are caused by viruses, and there is no good evidence that cough medicines are effective

The common cold is the most frequent infectious disease in humans under normal circumstances, the average adult gets two to three colds a year, while the average child may get six to eight Infections occur more

commonly during the winter these infections have existed throughout human history

Influenza affects both the upper and lower respiratory tracts,

COVID-19

A coronavirus is a kind of common virus that causes an infection in your nose, sinuses, or upper throat. Most coronaviruses aren't dangerous.

In early 2020, after a December 2019 outbreak in China, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. The outbreak quickly spread around the world.

COVID-19 is a disease caused by SARS-CoV-2 that can trigger what doctors call a respiratory tract infection. It can affect your upper respiratory tract (sinuses, nose, and throat) or lower respiratory tract (windpipe and lungs).

It spreads the same way other coronaviruses do, mainly through person-to-person contact. Infections range from mild to deadly.

SARS-CoV-2 is one of seven types of coronavirus, including the ones that cause severe diseases like Middle East respiratory

syndrome (MERS) and sudden acute respiratory syndrome (SARS). The other coronaviruses cause most of the colds that affect us during the year but aren't a serious threat for otherwise healthy people.

It's normal for a virus to change, or mutate, as it infects people. A Chinese study of 103 COVID-19 cases suggests the virus that causes it has done just that. They found two strains, which they named L and S. The S type is older, but the L type was more common in early stages of the outbreak. They think one may cause more cases of the disease than the other, but they're still working on what it all means.

It's too soon to tell how long the pandemic will continue. It depends on many things, including researchers' work to learn more about the virus, their search for a treatment and a vaccine, and the public's efforts to slow the spread.

More than 100 vaccine candidates are in various stages of development and testing. This process usually takes years. Researchers are speeding it up as much as they can, and some vaccines are already in late-stage trials. While some say we could have a vaccine by year's end, others predict it will be longer to ensure that the vaccine works, is safe, and can be distributed widely

No communicable diseases

No communicable diseases (NCDs) are currently responsible for over 60% of global deaths. This burden is one of the major public health challenges facing all countries, regardless of their economic status. NCDs

threaten economic and social development and, without concerted efforts at country level, are predicted to increase in the coming decade.

No communicable - or chronic - diseases are diseases of long duration and generally slow progression. The four main types of no communicable diseases are cardiovascular diseases (like heart attacks and stroke), cancer, chronic respiratory diseases (such as chronic obstructed pulmonary disease and asthma) and diabetes

Raised blood pressure: 130/85 millimeters of mercury (mm Hg) or higher for either number or both

HDL (“good cholesterol”): less than 40 milligrams per deciliter (mg/dL) in men; less than 50 mg/dL in women

Triglycerides: of 150 mg/dL or higher

Fasting blood glucose levels: 100 mg/dL or higher

Waist size: over 35 inches in women; over 40 inches in men

A person with these risk factors should address them through medical treatment and lifestyle modifications to lower the risks of developing a no communicable disease.

While no communicable diseases are long-term conditions that often can reduce one’s life expectancy, they can be managed with medical treatment and lifestyle changes.

If you are diagnosed with a non-communicable disease, it's important to stick to your treatment plan to ensure you stay as healthy as possible.

Risk factors a person can't change include age, gender, race, and family history.

Cancer

Cancer affects people of all ages, socioeconomic statuses, genders, and ethnicities. It's the second most-common cause of non-communicable disease death globally.

Some cancers cannot be avoided due to genetic risks. However, the World Health Organization estimates that 30 to 50 percent of cancers are preventable with adoption of healthy lifestyle choices.

Key steps in preventing disease include:

Avoiding tobacco

Limiting alcohol

Getting immunized against cancer-causing infections

The most common cancer deaths in men worldwide include:

Lung

Liver

Stomach

Colorectal

Prostate

The most common cancer deaths in women worldwide include:

Breast

Lung

Colorectal

Cervical

Diabetes

Diabetes occurs when the body cannot produce enough insulin, a hormone that regulates blood sugar (glucose). It can also occur when the body cannot effectively use the insulin it produces.

Some effects of diabetes include heart disease, vision loss, and kidney injury. If blood sugar levels are not controlled, diabetes can seriously damage other organs and systems in the body over time.

There are two main types of diabetes:

Type 1 diabetes is often diagnosed during childhood or young adulthood. It's the result of an immune system dysfunction.

Type 2 diabetes is often acquired during later adulthood. It's typically the result of poor diet, inactivity, obesity, and other lifestyle and environmental factors.

Under nutrition

There are 4 broad sub-forms of under nutrition: wasting, stunting, underweight, and deficiencies in vitamins and minerals. Under nutrition makes children in particular much more vulnerable to disease and death.

Low weight-for-height is known as wasting. It usually indicates recent and severe weight loss, because a person has not had enough food to

eat and/or they have had an infectious disease, such as diarrhea, which has caused them to lose weight. A young child who is moderately or severely wasted has an increased risk of death, but treatment is possible.

Low height-for-age is known as stunting. It is the result of chronic or recurrent under nutrition, usually associated with poor socioeconomic conditions, poor maternal health and nutrition, frequent illness, and/or inappropriate infant and young child feeding and care in early life. Stunting holds children back from reaching their physical and cognitive potential.

Children with low weight-for-age are known as underweight. A child who is underweight may be stunted, wasted, or both.

Protein - energy malnutrition (PEM)

Malnutrition refers to a form of malnutrition where there is inadequate calorie or protein intake.

Types include:

- Kwashiorkor (protein malnutrition predominant)
- Marasmus (deficiency in calorie intake)
- Marasmus Kwashiorkor (marked protein deficiency and

Marked calorie insufficiency signs present, sometimes Referred to as the most severe form of malnutrition

Marasmus

- Marasmus is a form of severe malnutrition characterized by

Energy deficiency. A child with marasmus looks emaciated.

- Body weight is reduced to less than 60% of the normal (Expected) body weight for the age.
- Marasmus occurrence increases prior to age 1

Clinical Manifestations:

1. Wasting
 2. Muscle wasting
 3. Growth retardation
 4. Mental changes
 5. No edema
- . Variable-subnormal temp,
Slow PR, good appetite,
Often w/diarrhea,

Kwashiorkor

- Kwashiorkor occurrence increases after 18 months.
- Kwashiorkor is protein deficiency with adequate energy
Intake

Clinical Manifestations:

A. Diagnostic Signs

1. Edema
2. Muscle wasting
3. Psychomotor changes

B. Common Signs

1. Hair changes
2. Diffuse depigmentation of skin
3. Moon face
4. Anemia

Vitamin A deficiency

- Vitamin A deficiency (VAD) is a lack of vitamin A in Humans.
- It is common in poorer countries but rarely seen in more Developed countries.
- (night blindness) is one of the first signs of VAD.

Iron deficiency anemia symptoms

The most widespread nutritional deficiency worldwide is iron deficiency. Iron deficiency can lead to anemia. This is a blood disorder that causes fatigue, weakness, and a variety of other symptoms. Iron is found in foods such as dark leafy greens, red meat, and egg yolks.

Anemia that comes on quickly often has greater symptoms

Which may include:

- Confusion,
- Feeling like one is going to pass out
- increased thirst.
- There needs to be significant anemia before a person

Becomes noticeably pale.

Deficiency of vitamin D

Vitamin D deficiency can lead to a loss of bone density, which can contribute to osteoporosis and fractures (broken bones). Severe vitamin D deficiency can also lead to other diseases. In children, it can cause rickets. Rickets is a rare disease that causes the bones to become soft and bend.

Overweight and obesity

Overweight and obesity is when a person is too heavy for his or her height. Abnormal or excessive fat accumulation can impair health.

Body mass index (BMI) is an index of weight-for-height commonly used to classify overweight and obesity. It is defined as a person's weight in kilograms divided by the square of his/her height in meters (kg/m^2). In adults, overweight is defined as a BMI of 25 or more, whereas obesity is a BMI of 30 or more.

BMI 20-24.9 → normal or desirable weight range.

-BMI 25-29.9 → low relative risk (over weight).

-BMI 30-40 → moderate risk (moderate obesity) = grade I&II

-BMI > 40 → high risk (morbid Obesity) =grade III

-Waist to hip ratio:

Waist to hip circumference can identify the two types of obesity.

A ratio of 0.7 considered as normal.

A ratio < 0.7 indicates lower body obesity.

A ratio > 0.7 indicates upper body obesity.

Fat below the waist is more difficult to lose than above the waist.

Diet; to lose 500gm/wk. The patient should reduce caloric intake by 500Kcal/day=3500Kcal/wk. = max. Loss 2kg/m.

Exercise; incr. physical activity which result in expenditure of 500Kcal; running for 45min., playing tennis 60min., walking 75min., bicycling 90min.

Behavioral modification: eating when hungry, & stopping with first sign of satiety, small, regular & frequent meals.

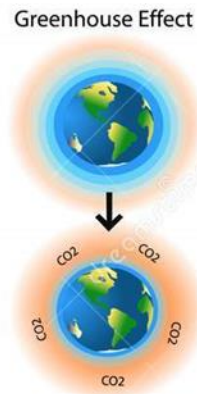
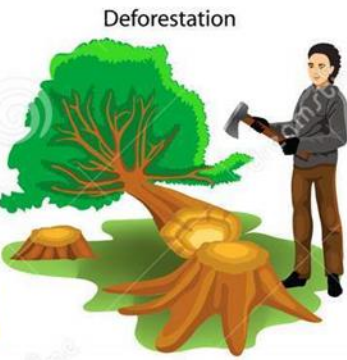
Environmental health

is the branch of public health that: focuses on the relationships between people and their environment; promotes human health and well-being;

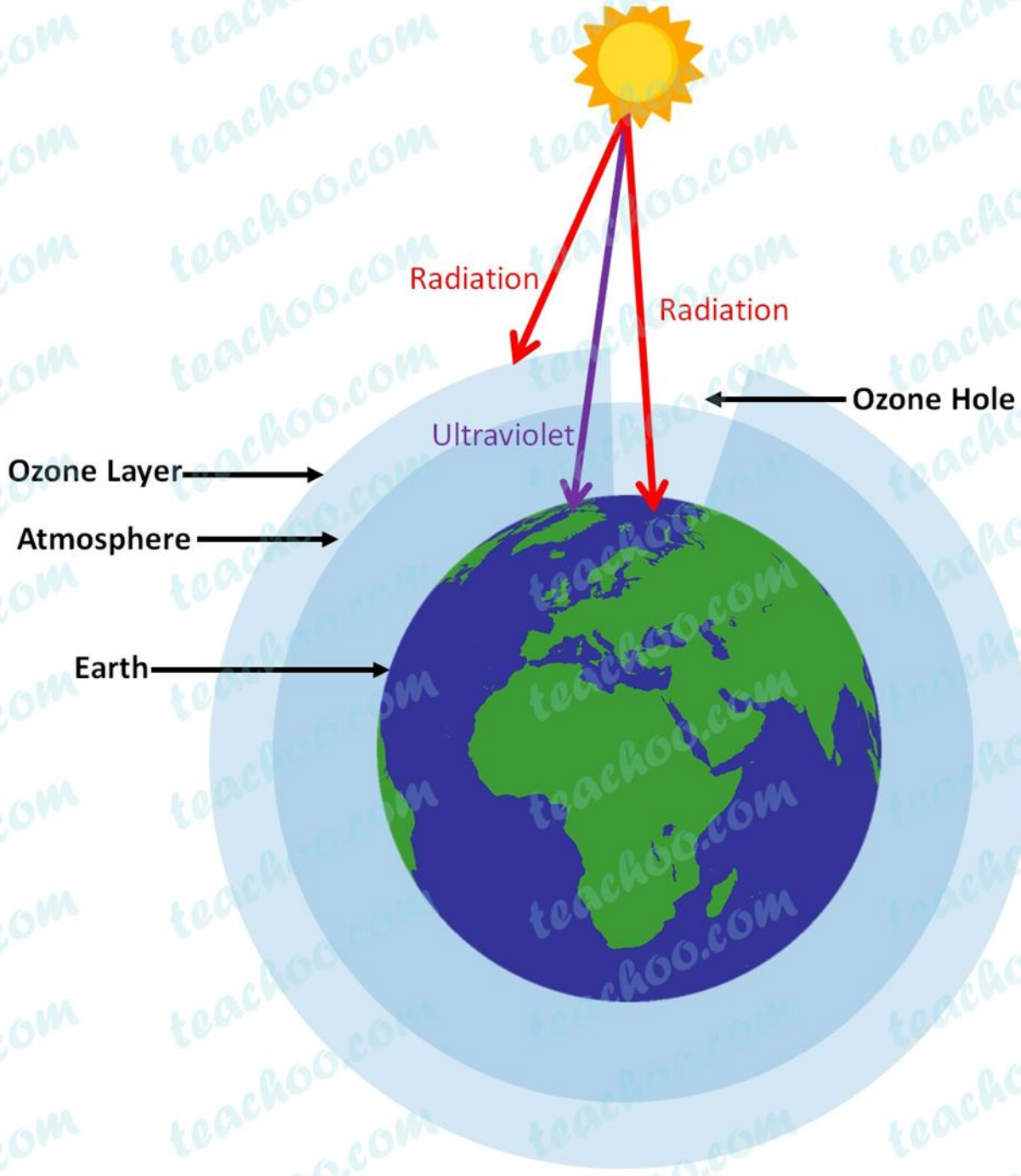
and fosters healthy and safe communities. Environmental health is a key part of any comprehensive public health system.

They include: Exposure to hazardous substances in the air, water, soil, and food. Natural and technological disasters. Climate change

The three types of environment are the physical environment, social environment, and culture.



Ozone Layer Depletion



Air pollution

- Air pollution is by far the most harmful form of pollution in our environment.
- Air pollution is caused by the injurious smoke emitted by cars, buses, trucks, trains, and factories, namely sulphur dioxide, carbon monoxide and nitrogen oxides.

Types of Water Pollution

Sewage

Disease-causing agents

Sediment pollution

Inorganic plant and algal nutrients

Organic compounds

Inorganic chemicals

Thermal pollution

