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## 1

### Epidemiology

#### **1. Define Epidemiology**

A. Epidemiology is defined as the distribution and determinants of disease frequency or health events in man. Modern day epidemiology is different from the earlier period where it just referred to as study of epidemics. It now includes comprehensive methods for control of diseases, including non-communicable diseases. Distribution refers to the time; place and person characteristics of disease while the determinants (what determines disease) are generally characterized as agent, host and environmental factors. Since freedom from disease allows an individual to remain healthy, it is also important to find out how and why individuals do not suffer from disease and remain healthy. Such analyses will help in finding solutions to disease and maintaining good health.

#### **2. What are the uses of epidemiology?**

A. The major uses of epidemiology are:

- a. To assess the magnitude or burden of disease in a community. It, therefore, helps in studying the occurrence of disease in a population.
- b. To assess the health status of communities. It, therefore, helps in establishing a community diagnosis.
- c. To search for determinants of disease. To find out how and why disease is caused is a major use of epidemiology.
- d. To estimate an individual's risks and chances of suffering from a disease and to establish the prognosis in an individual suffering from disease.
- e. To plan comprehensive health services, including specific strategies and ways and means of implementation.
- f. To evaluate strategies and interventions for disease control. Such evaluation helps in identifying weaknesses and to suggest remedial measures for the future. Evaluation of costs and benefits or effectiveness of specific interventions is also an integral use.
- g. To complete the natural history of disease. In a hospital setting only the terminal cases are seen and how disease starts and presents in its initial stages is only possible by studying disease in the community.
- h. To forecast future disease trends.
- i. To identify syndromes.

#### **3. What is the epidemiological triad?**

A. Disease is caused by an interaction between agent, host and environmental characteristics. When all three are in harmony, health is ensured but maladjustment in their relationships leads to disease. These three factors together constitute the epidemiological triad.

#### **4. What is the difference between retrospective and prospective studies?**

A. Retrospective studies start after a disease has occurred and the investigator looks back in time to find out what agents or characteristics (including habits) the individuals were exposed to and which could lead to disease. Case control studies are examples of retrospective studies. In prospective studies individuals are identified before occurrence of disease and they are followed up to see which individuals develop disease. The characteristics or exposures of these individuals to disease causing agents are compared with the characteristics of individuals who do not suffer from disease. This helps in searching for determinants of disease.

#### **5. What is a case control study?**

A. A case control study is an epidemiological study where a group of individuals with disease are compared with a group of individuals who are not suffering from disease in terms of specific disease causing exposures. Since the starting point is a group of people who already have suffered from the disease, this is labeled as a retrospective study.

##### Advantages of case control studies

- Relatively quick and easy to undertake.
- Relatively cheap to undertake.
- Only method useful in rare diseases.
- Not enmeshed in problems of follow-up as the data is collected at one point in time.
- Can be used to study the effect of many exposure variables on a single disease outcome.

##### Drawbacks of case control studies

- Prone to selection and recall bias.
- Can't measure relative risk or provide incidence estimates.
- Sometimes the occurrence of the exposure in terms of time, i.e. whether it occurred before the disease may be difficult to decipher.
- Can't be used for rare exposures.
- Designing the study is not an easy task.

#### **6. What is a cohort study?**

A. Cohort studies are forward looking, i.e. they look for the development of disease in a group of individuals (the cohort) free of the same at the beginning. The group is followed up over a period of time. During this period some persons will develop the disease under study while others will remain free of the disease. The characteristics (and exposure to disease causing factors) are compared between those who suffer from disease and those free from the disease. The literal meaning of the term 'cohort' refers to a group that shares similar characteristics.

Thus, it implies that one needs to identify groups of populations who are free of the disease being studied and who are similar in all respects, except the specific exposure variable or characteristic whose effect is being related to the disease being studied. These groups are then followed up for the period of time that it takes for the disease to develop.

#### **7. What is a Randomized Controlled Trial?**

A. A randomized controlled trial is an experimental method where individuals are randomly allocated to an experimental or a control group and the effect or response of a drug or intervention is compared between the two groups. The two key features are 'randomization' and 'controlled'. To ensure that there is no bias on part of the investigator, these trials are 'blinded' – single blind means the patients do not know what the intervention is; 'double' blind means that neither the patient nor the researcher knows what the drug/ intervention package is while 'triple' blind means that the analysis team also does not know which is the experimental and which is the control group till the study has been completed.

#### **8. What is a Community Trial?**

A. A community trial is a modification of the clinical trial where instead of individuals being allocated to experimental or control groups, whole communities are randomly allocated to receive specific interventions and analysis is done for whole communities rather than for individuals in the communities. Vitamin A supplementation trials, iron supplementation or iodine supplementation trials are all examples of community trials.

#### **9. What is a vaccine trial?**

A. When a randomized control trial is done to test the efficacy of a vaccine in preventing disease, it is called a vaccine trial.

#### **10. What is the difference between Descriptive and Analytical Epidemiology?**

A. The descriptive methods are mostly concerned with the distribution of disease/health condition, while the analytical methods are concerned with the determinants of disease/health condition.

There are a number of different descriptive methods:

- Ecological /correlational studies.
- Case reports/case series.      – Cross-sectional designs

Analytical studies are concerned with the determinants of disease rather than with the distribution. They focus attention on ways to prove a hypothesis suggested by the earlier types of studies. Based on the analytical method used, they can be categorized into two types:

- Observational methods      – Experimental methods.

In the observational methods, the disease phenomenon is not in the grip of the investigator. The clinician – investigator only records the sequence of events as they unfold in front of his eyes. The outcome events are then related to the different input variables to understand the dynamics of disease causation. In the experimental studies or the intervention studies, the researcher selects a group of patients and then decides how to intervene/treat the group, and then records the differences. Thus, one group of individuals is labeled as an experimental group and is given some ‘treatment’, while the other group is labeled as the control group among whom either a placebo may be used or nothing may be done.

These studies can be further categorized as follows:

Observational Studies      Experimental Studies

- Case control studies      – Intervention studies      – Cohort studies with/ without control      – Clinical trials (RCT)

- Community trials

### **11. What is sampling?**

A. Sampling can be defined as the process of selecting a statistically determined number of subjects from the universe or reference population, which provides an accurate estimate of the problem being studied. Thus, only a proportion of the reference population is covered, but the results approximate the actual prevalence of the disease condition in the reference population. Strictly speaking, the results obtained are applicable only to the population from which the sample was drawn, but the results are generally extrapolated to other populations that are similar to the reference population. A sample is the minimum number of people or units who need to be contacted or examined to obtain statistically acceptable results and thereby permit valid inferences to be drawn.

### **12. What are the different sampling methods that you know of?**

A. The different sampling methods include simple random sampling, systematic random sampling, stratified random sampling, cluster sampling, multistage sampling and purposive sampling. Purposive sampling is not used in epidemiological or health sciences as it gives biased results. All other sampling methods are called probability-sampling methods.

### **13. What is the difference between simple and stratified random sampling?**

A. In this method, every individual has an equal chance of being selected in the sample. The first step involves enumeration of the total population wherein every individual is sequentially numbered from 1...n (n =last member in the population). The enumeration list of the total population from which the sample is drawn is called the sampling frame. The next stage is the actual selection of the sample, which can be done by different methods like drawing numbers from a hat or picking numbers from a random table, etc. Stratified sampling is done to give the different population subgroups an equal chance of being selected. In this way, male/ female or urban / rural can be given adequate representation to reduce bias.

### **14. What is systematic sampling?**

A. Systematic sampling is a method of probability sampling, which is used to simplify the selection procedure. After enumerating the units i.e. villages, houses, etc. they are selected at a predetermined interval, i.e. every nth unit. The procedure has the advantage of easy administration in the field, but is inferior compared to the simple random sampling

### **15. What is cluster sampling? Give examples of where cluster sampling has been used in reproductive and child health?**

A. For conducting surveys or epidemiologic investigations on large population groups, the simple random technique is not of much use. This is because construction of the sampling frame becomes very difficult when there are a large number of individuals to be enumerated. In such situations, groups, rather than individuals, can be selected in the initial stage of the sampling process. In the selection of the final stage units, instead of randomly selecting the individuals to be included, all the individuals in the identified cluster are examined.

EPI vaccine coverage surveys adopted the cluster sampling technique and now this technique is widely used in many situations where coverage / lameness / disability are surveyed.

### **16. What is an epidemic?**

A. The occurrence of a disease clearly in excess of normal expectations is called an epidemic. The number of cases, which should be diagnosed before declaring an epidemic status, depends on the number of cases routinely seen in that area. In an area where a disease has not been seen for many years, even the occurrence of a single case may be sufficient to call it an epidemic. Some people look at the mean (or average) number of cases and if the cases are beyond two standard deviations they call it an epidemic.

**17. Give some examples of epidemic diseases, which have occurred in India recently?**

A. The recent outbreak of plague in India where cases were not seen for many years is an example of an epidemic. HIV/AIDS is also a disease with epidemic proportions. Epidemics of dengue, JE are also reported from time to time. Epidemic diseases need not necessarily be communicable diseases. Therefore, WHO also looks at smoking as an epidemic.

**18. What is a pandemic?**

A. An epidemic which breaks out across many continents is called a pandemic – i.e. occurring across the world.

**19. Name some pandemic diseases**

A. HIV/AIDS and smoking can be called as modern day pandemics as they have affected millions of people across the world. Cholera was one of the most common diseases, which assumed pandemic proportions. Drugresistant tuberculosis is also a pandemic. Plague was also pandemic in historical times.

**20. What are endemic diseases? Name some endemic diseases**

A. The constant, continuous or usual presence of a disease in a defined geographic area or delimited territory is called an endemic disease. Hyperendemic refers to a persistent intense transmission in an area while holoendemic means a disease starting early in life and affecting most of the population. An endemic disease may become an epidemic if the number of cases usually seen suddenly increase in proportion. Malaria, tuberculosis, leprosy, filariasis, etc. are examples of endemic diseases.

**21. What is prevalence rate?**

A. The proportion of persons suffering from a specific disease out of the population normally residing in that area, at a particular point in time, is called the prevalence rate. It includes both the new cases as well as the old cases occurring in the area at the point in time when the examination was undertaken. The point in time can be one day or one year or more depending upon how much time it takes to examine the population residing in an area. The persons suffering from the numerator while the population from which they hail is called the denominator. It should be seen that the numerator is part of the denominator. For example, if female genital discharge is being studied, the denominator should only include the population who are at risk of suffering from a disease i.e. women. Prevalence rate can be represented as a percentage if a disease is common or as per 1000 or 100,000 population if disease is rare.

**22. What is incidence rate?**

A. Incidence rate refers to the number of new cases occurring in a population over a specified period of time. The numerator should be part of the denominator as in prevalence rate but unlike as in prevalence rate only new cases are considered. If a case started before the reference period but is continuing to the present, it is not considered in the numerator. E.g. if the reference period is from 1st Jan – 31st Jan 2002, cases, which started before 1st Jan 2002 but are still suffering will not be included in the numerator. Incidence rate is generally depicted as per 1000 or 100,000.

**23. What is the relationship between prevalence and incidence?**

A. Prevalence of a disease is the product of incidence and the duration of disease ( $P = I \times D$ ). Therefore, prevalence of a disease depends not only on the actual number of people who develop a disease but also on the duration of a disease. For short duration diseases like common cold, the prevalence and incidence are almost identical while for chronic or long-standing diseases like tuberculosis, leprosy or blindness the prevalence is always much higher than the incidence.

**24. How does prevalence of a disease increase?**

A. The prevalence of a disease can increase in the following conditions:

- The duration of the disease is very long (i.e. chronic conditions)
- The level of incidence i.e. the higher the incidence, the larger is the prevalence.
- Improved methods of diagnosis that lead to detection of larger number of cases than before.
- Availability of effective treatment, which prolongs life such that the individual lives longer while still suffering from the disease.
- A sudden migration of cases into an area where the disease was not very common earlier.

**25. How does prevalence of a disease decrease?**

A. – A very short duration of the disease (applicable to the acute disease conditions).

- A very low incidence of disease
- Lack of proper diagnostic equipment or skills for the detection of disease.
- Diseases with a high mortality such that very few individuals survive
- Out migration of diseased individuals

**26. In which disease conditions is prevalence more appropriate and why?**

A. Prevalence is most appropriate in long-standing or chronic diseases as the window period in which a diagnosis can be established is much higher and therefore, cases will not be missed during a survey. On the other hand, short duration diseases would occur and recover so fast that they cannot be examined (or are missed) at a specific point in time.

**27. In which diseases is incidence more appropriate and why?**

A. Incidence is most appropriate in disease of a short duration as such diseases may occur more than once during a reference period and all the episodes may not be captured if the prevalence of the disease were to be measured. E.g. If a study were done on diarrhea, if the number of people suffering from diarrhea in a one-year period was measured, it would always be much lower than the number of episodes of diarrhea that the population staying in that area would suffer.

**28. What do you mean by a primary case?**

A. The first case of a disease which occurs in a community/area is called the primary case. Many a time, the primary case may not be recognized as the disease comes to notice much later. Only by historical review can, the possible primary case, be located in such a case. In some disease like acute conjunctivitis a number of primary cases may occur almost at the same point in time. In such a scenario, the primary cases are referred to as “Co–primaries”

**29. What do you mean by an index case?**

A. The first case, which comes to the attention of the health authorities in an area, is referred to as the index case. Such a case may or may not be the primary case.

**30. What is Secondary Attack Rate?**

A. The secondary attack rate refers to the number of cases occurring among contacts of a primary case within the known incubation period of the disease. The denominator refers to the number of susceptible contacts who are in close touch with the primary case. However, if whether a person among the contacts has previously suffered from the specific disease and developed immunity is not known, then all the contact should be considered in the denominator. Such persons are usually other members of the family / neighborhood / institution who stay with the primary case.

**31. What is a secular trend?**

A. If the pattern or trend of disease frequency changes only over many years then it is called a secular trend.

**32. What is a cyclic trend?**

A. If the occurrence of disease changes over a short duration of time like a year, it is called a cyclic trend. Most epidemic diseases in India show a cyclic trend.

Some diseases change in frequency over seasons and such changes are referred to as seasonal changes – Measles and chickenpox are examples of such diseases.

**33. What is herd immunity? Give examples where it is important?**

A. The immune status of a group of people/community is called herd immunity as it is the immune status of the ‘herd’ of people. For many communicable diseases, an outbreak of disease is only possible if the level of immunity is sufficiently low and there are a large number of susceptibles in the population. In diseases like poliomyelitis, diphtheria, measles etc., herd immunity plays an important role. However, in a disease like tetanus or rabies where every individual is at risk unless specifically protected, herd immunity plays no role.

**34. What is a nosocomial infection?**

A. An infection occurring in a patient in a hospital or other health-care facility and in whom it was not present or incubating at the time of admission or arrival at a healthcare facility is called a nosocomial infection. It refers to diseases transmitted from a hospital. Usually such infections are more difficult to manage as they are generally resistant to most of the common antibiotics. Nosocomial infections also include those infections, which were contacted in the hospital but manifested after discharge, and also infections suffered by staff members if they contacted the infection from the hospitalized patients.

**2.**

## Screening

**35. What do you understand by the term screening?**

A. Screening denotes the search for unrecognized disease or defect in apparently (or outwardly) healthy persons by the application of rapid diagnostic tests, examinations or procedures. The basic objective of screening is to facilitate an early diagnosis so that the prognosis can be improved by remedial action.

**36. What is mass screening?**

A. When all members of a population are screened for disease it is called mass screening. This is very costly and the yield of cases is usually too small to warrant such a screening procedure.

**37. What is high-risk screening?**



A. High risk or selective screening refers to the situation where tests are offered only to those individuals who are at high risk of developing a specific disease. This makes the screening process more focused and reduces the overall costs as a large number of people who have extremely remote chances of developing a disease are not screened.

**38. What criteria should you look for before screening for any disease?**

A. The following criteria should be satisfied before embarking on screening:

1. The condition should be an important public health problem.
2. The natural history of the condition from the latent to manifest disease should be adequately understood.
3. There should be a recognizable latent or early asymptomatic stage of the disease, during which identification will lead to improved prognosis or outcome.
4. There should be an accepted and effective treatment for the patients with recognized disease.
5. Facilities for full diagnostic work-up and treatment should be available.
6. There should be a suitable test available which should be valid.
7. The test should be acceptable both to the public as well as the professionals.
8. There should be an agreed policy on whom to treat as patients, including the management of borderline disease.
9. Case finding should be a continuous process.
10. The cost of early diagnosis and treatment should be economically balanced in relation to the total expenditure on medical care (The opportunity cost should be justifiable).

These can be classified as:

- Disease criteria
- Test criteria
- Diagnostic and treatment infrastructure criteria

**39. What is sensitivity?**

A. This refers to the proportion of truly diseased individuals in the population who have been correctly identified as diseased by the screening test. A test with a high sensitivity gives only a few false negatives.

**40. What is specificity?**

A. This refers to the proportion of the normal individuals who are correctly labeled as nondiseased by the screening test. A test with a high specificity will only give a few false positives. It is desirable that a screening test should have a high sensitivity and specificity.

### 3.

## Communicable Diseases

**41. What are the different ways in which communicable diseases can be transmitted?**

A. Communicable disease can be transmitted in a number of ways:

- a. Direct transmission: Contact transmission
- b. Indirect transmission: Vehicle (fomite) borne, vector-borne, air-borne (droplet nuclei and infected dust)
- c. Transplacental

**42. What is the period of communicability?**

A. Period of communicability or communicable period refers to the time during which an infectious agent may be transferred directly or indirectly from an infected person to a susceptible person. This period is usually equal to the maximum known incubation period for that disease.

**43. What is contact transmission?**

A. When disease is spread by direct contact with an infected person, it is called contact transmission. This may be by kissing, touching, biting or sexual intercourse. Ringworm, scabies, yaws, etc. are examples of such diseases.

**44. What are zoonoses?**

A. An infectious disease transmissible under natural conditions from vertebrate animals to man is called a zoonoses. There are over 150 disease common to man and animals. These include anthrax, psittacosis, liver fluke, T. solium, T. saginata, bovine TB, salmonellosis, brucellosis, scabies, plague, typhus, yellow fever and KFD.

**45. What is passive immunization?**

A. Passive immunization refers to the injection of specific protective antibodies (hyper immune serum, immune serum globulin, etc.) to provide immediate protection to an individual. Transplacental transfer is also an example of passive immunization. Here, readymade antibodies are provided to an individual especially in an emergency when one cannot wait for the body to produce antibodies. Examples are diphtheria, tetanus, and rabies, etc.

**46. What is active immunization?**

A. In active immunization, a live/killed vaccine is injected and the body reacts by producing antibodies, which make the individual immune and protect against attack by infectious agents. Active immunity is also achieved after suffering from a disease like measles, chickenpox, etc. Active immunity is long lasting and more effective in preventing future disease. The only drawback is that it takes time for the body to produce antibodies and therefore active immunization is usually not useful in an emergency. Rabies is an exception because the incubation period of the disease is long.

**47. What is the incubation period for chickenpox?**

A. Incubation period is 7-21 days and commonly it is 14-16 days.

**48. How does chickenpox spread?**

A. It can affect people of all ages but most commonly children below 10 years are affected as they do not have protective antibodies. It is most commonly spread due to respiratory secretions from infected persons, which are teeming with the virus. Crusts of chickenpox are not infective.

**49. What is the incubation period for measles?**

A. The incubation period of measles ranges from 8 –16 days with an average incubation period of 10 days.

**50. What are the different life threatening complications of measles?**

A. Common life-threatening complications of measles include broncho-pneumonia and diarrhea. Encephalitis can also occur rarely.

**51. When is measles most infectious?**

A. Measles is most infectious 4 days before to 5 days after the rash appears.

**52. How does the rash of measles differ from the rash of chickenpox?**

A. An eruptive rash appears in measles as dark red macules or maculopapular granules, first evident behind the ears and at the junction of the scalp and forehead and then spreading over the face, trunk and limbs, very rapidly. The rash lasts for 4-6 days and disappears in the same order in which it appeared. It dries off leaving a brawny discoloration of the skin. The rash in chickenpox has a centripetal distribution – first appearing on the trunk and then spreading towards the periphery. The palm and soles are not affected. The rash is seen mostly on the flexor surfaces and appears on the very first day and thereafter in crops, evolving very rapidly. The lesions are superficial, unilocular and are surrounded by a red areola. They are small, elliptical and mostly discrete with no umbilication.

**53. What is German measles?**

A. German measles is Rubella and is a mild eruptive fever like measles. It is caused by Rubella virus.

**54. What are the complications if a pregnant mother gets Rubella?**

A. The special public health significance of Rubella is that a child may be born with congenital defects like deafness, microcephaly, microphthalmia, PDA, septal defects and other malformations, which are called the Congenital Rubella Syndrome, if the mother is infected during pregnancy. The frequency of congenital defects is 20-25% if infection occurs in 1st trimester and less after that.

**55. What is MMR vaccine and how and when should it be given?**

A. MMR vaccine is measles, mumps and rubella vaccine, which is a live, attenuated vaccine and is administered as a single IM dose after 1 year of age. If measles vaccine has been administered to a child at 9 months, MMR should be given at 15 months of age.

**56. Which diseases do you know of which are planned to be eradicated?**

A. Gineaworm, poliomyelitis and leprosy are three major diseases, which are on the eradication agenda. Smallpox was the first disease, which was successfully eradicated.

**57. What are the diseases caused by rodents?**

A. Plague, murine typhus, salmonellosis, Weil's disease, rat bite fever, trichinosis, rickettsial pox and lymphocytic choriomeningitis are diseases caused by rodents.

**58. How can you distinguish Culex from Anopheles mosquitoes?**

A. The anopheles lays eggs singly on water while culex lays eggs in clusters or rafts of 100-200 eggs. Culex eggs are oval with no air floats while anopheles eggs are boat shaped with lateral air floats. The larvae of anopheles have no siphon tubes, lie parallel to water surface and have palmate hair on abdominal segments, while in culex, two siphon tubes are present, they hang at an angle and have no palmate hair. Adult anopheles sit against the wall at an angle, have spotted wings and palpi are long while adult culex sit parallel to the wall and the head and body are angled or hunch backed, make ringing noises in ears, have no spots on wings and the palpi are shorter in the females.

**59. What are the common diseases transmitted by mosquitoes in India?**

A. The common diseases transmitted by mosquitoes in India are malaria (anopheles), filarial, JE and West Nile fever (Culex), Malayan filariasis and Chikungunya fever (Mansonia) and dengue, yellow fever, DHF and Chikungunya fever (Aedes).

**60. What advice on chemoprophylaxis for malaria will you give to a foreigner visiting India?**

A. Chloroquine 300 mg once a week starting 2 weeks before arrival or latest on the day of arrival and continued for 4-6 weeks after leaving the country is useful if there is no resistance to chloroquine in the area to which the foreigner is traveling. Sulfadoxine – pyremethamine combination or mefloquine can also be taken if chloroquine resistance is reported.

**61. What is presumptive treatment?**

A. This refers to treating every case of fever presuming it to be malaria and therefore it is called presumptive treatment. This consists of 600 mg (4 tablets) of chloroquine given to a febrile person without waiting for the report of the blood smear.

**62. What are Fever Treatment Depots?**

A. These are the health facilities where personnel collect the blood smear and provide presumptive treatment to the febrile individuals. If the smear is positive, the health personnel go back and provide radical Rx.

**63. What drugs and how much will you give for radical treatment of P. falciparum malaria?**

A. Radical treatment consists of a single dose of 600 mg chloroquine plus 45 mg of primaquine.

**64. What are impregnated nets?**

A. These nets are used for control of malaria and are plastic nets, which are impregnated with synthetic insecticides.

**65. What are the different plasmodium species causing malaria in India?**

A. The species in India are vivax, falciparum and malariae.

**66. What is spleen rate in malaria?**

A. Children aged 2 – 10 years are examined for enlargement of spleen and areas are classified according to endemicity as indicated by the spleen rate :

Below 10% - Non endemic

10 – 25% - Hypoendemic

25 – 40% - Endemic

> 40% - Hyper endemic.

**67. What are the indices for blood surveys for malaria?**

A. The main indices are:

a. Infant parasite rate: It is a good indicator of recent infection and is measured by proportion of blood smears of infants positive for malarial parasite.

b. Children parasite rate: Here blood smears of children aged 2-10 years are examined.

c. Annual parasite index: This is the most common index used currently. It is defined as the number of confirmed malaria cases per 1000 persons in an area per year.

d. Slide positivity rate: Proportion of slides examined which are positive for the malarial parasite.

e. Slide falciparum rate: Proportion of slides examined which are positive for falciparum species.

f. Annual Blood Examination Rate: The number of blood slides examined per 100 population. An ABER of 10% is warranted for good coverage of the population under surveillance.

g. Monthly blood examination rate: This should be 1% during the non-transmission season and 2% during the transmission season (July – Oct) in areas under active surveillance and 15% and 20% respectively (as a proportion of new OPD cases) in passive surveillance zones.

**68. What is active surveillance?**

A. In active surveillance, the health worker goes from house to house to search for cases of fever.

One round is completed in a fortnight and the worker then repeats the visits. Thus every house is visited every fortnight. The health worker asks 4 questions:

a. Is anybody suffering from fever currently?

b. Did anybody suffer from fever in the past fortnight?

c. Did any guest with fever come to the house in the past fortnight?

d. Did any fever case leave the area in the past fortnight?

Any person complaining of fever is then given presumptive treatment after collecting a blood smear.

**69. What is passive surveillance?**

A. In passive surveillance, any fever case reporting to a health facility is given presumptive treatment after a blood smear is made.

**70. What is Annual Parasite Incidence and how is it important?**

A. It is defined as the number of confirmed malaria cases per 1000 persons in an area per year. It is the most sensitive index in use currently. The target for 2000 AD was an API of 0.5% which was more than 2 in 1991.



**71. What is the objective of the modified plan of operations in malaria?**

A. The objectives of the modified plan of operations are:

- a. To prevent deaths
- b. To reduce case load
- c. To consolidate achievements made under NMEP
- d. To maintain the green and industrial revolution.

**72. What is Annual Blood Examination Rate?**

A. This is a monitoring tool to ensure that adequate number of blood slides have been collected. The workers should have collected blood smears equivalent to > 10% of the population residing in an area. This is based on the expected load of fever cases in a community in a year.

**73. Which are the endemic areas for chloroquine resistant malaria in India?**

A. All the North East States in the country, parts of Chhattisgarh, Madhya Pradesh, Andhra Pradesh, Jharkhand, West Bengal and Orissa are endemic areas for chloroquine resistant malaria.

**74. Name some arthropods which transmit diseases.**

A. Arthropods, which transmit disease, include mosquitoes, houseflies, sand fly, tsetse fly, black fly, lice, rat flea, reduviid bug, cockroaches, ticks, trombiculid mite and cyclops.

**75. What do you understand by biological control?**

A. Biological control means use of animal species to kill disease causing vectors. Gambusia and Lebistes fish have been used effectively in malaria control. Coelomomyces fungus and some other fungi, bacilli, protozoa and nematodes have been tried for biological control. This method, if effective can reduce the harm caused to man and environment by insecticides.

**76. What are the diseases transmitted by lice?**

A. Epidemic typhus, quintana, trench fever, relapsing fever and secondary dermatitis are some disease caused by lice.

**77. What are arboviruses?**

A. They are defined as those viruses that are maintained in nature principally or to an important extent through biological transmission between susceptible vertebrate hosts by haematophagous (blood feeding) arthropods.

More than a 100 arboviruses are known to produce disease in man.

**78. What diseases are transmitted by hard tick?**

A. Hard ticks transmit tick typhus, viral encephalitis, KFD, tularemia, tick paralysis and babesiosis.

**79. What diseases are transmitted by soft tick?**

A. The soft ticks transmit Q fever and relapsing fever.

**80. How is Diphtheria spread?**

A. Diphtheria is spread through direct droplet/ direct air-borne routes and indirectly through inhalation of contaminated dust by dried particles of the diphtheria membrane. It can also be spread through contaminated milk, fomites, convalescent or healthy carriers, cross infection in wards & infection of wounds or cuts in skin or mucous membrane, including conjunctiva.

**81. What is the Schick test?**

A. The Schick test was done to identify individuals who are susceptible to diphtheria and those who are allergic to the toxoid used in the vaccine. With universal immunization becoming the rule, the use of the test has decreased tremendously. The test was done by intradermal injection of 0.2 ml of Schick test antigen or toxin in one forearm and heated toxin in the other forearm as a control.

**82. Which strain is used for making BCG vaccine?**

A. The Danish 1331 strain of the BCG antigen has been recommended by the WHO for production of BCG vaccine.

**83. How is BCG vaccine given?**

A. 0.1 ml of BCG vaccine (producing a weal of 8 mm) is given intradermally over the deltoid muscle using a tuberculin syringe. In neonates below 4 weeks of age, 0.05 ml is recommended. The dose is given immediately after birth or as soon as possible after birth, preferably before 6 weeks of age.

**84. What are the normal reactions that occur after giving BCG vaccine and what advice should be given to the mother?**

A. The weal raised immediately after giving the BCG vaccine disappears within a few hours. Nothing happens over the next two weeks. Redness and induration at the site are seen in the third week. A papule then develops reaching its maximum size in the 4th week. The papule cracks, discharges pus and is gradually changed into a crust during the 5th – 6th week. The scab falls off during the 7th – 8th week leaving a small oozing ulcer which heals and leaves a scar about 5 mm in diameter. These reactions are often more marked in positive reactors.

Mothers should be sensitized about all the normal reactions so that they do not get worried. They should be told not to apply any medicine or lotion to the injection site when the crust forms or when pus is seen. They should be told to look for enlargement of regional lymph nodes, keloid formation or an abscess formation and to bring the child to the clinic if any such complications are seen.

**85. What is the Tuberculin test?**

A. The tuberculin test is performed to screen individuals who are already infected and those who are highly susceptible to the disease. Tuberculin containing PPD (purified protein derivative) prepared from the RT strain along with Tween 80 is injected intradermally. The injection is given on the anterior side of the forearm and the result is read after 48 – 72 hours. The induration is measured and any induration greater than 10 mm is taken as positive. Strong reactors (more than 20 mm induration) have more chance of developing active TB. Similarly weak reactors (< 5 mm) also have a higher chance of infection. In countries where BCG vaccine is given at birth, tuberculin testing loses its value.

**86. What is chemoprophylaxis? Gives some examples**

A. Chemoprophylaxis is the use of drugs to prevent onset of disease in individuals who are exposed to disease causing organisms. This can be of two types – Primary (giving drugs before a person is apparently infected) or secondary (after a person is infected but disease has not manifested). Malaria and TB are two diseases where the principles of chemoprophylaxis are put to good use.

**87. What is Short Course Chemotherapy?**

A. Short course chemotherapy is now being widely used in TB. A combination of 4 drugs is given for the initial period followed by 2-3 drugs during the follow up phase of 4-6 months. The total duration of most short course regimens is 6-8 months. A number of regimens have been developed. Common ones use Rifampicin, INH, Streptomycin and Pyrazinamide for 2 months followed by Rifampicin and INH for 4-6 months. The intensive phase with four drugs rapidly converts a sputum positive person to sputum negative and therefore decreases the transmission potential of the affected individual.

**88. What is DOTS?**

A. A major problem in tuberculosis is the lack of compliance with the recommended drugs by the patients and this leads to inadequate treatment, which further is responsible for multi drug resistance. To avoid this, under the National Programme, the patients are made to take the drugs in the presence of the health workers. This is therefore called Directly Observed Treatment Schedule (DOTS).

**89. What is DOTS-Plus?**

A. Because of the emergence of multiple drug resistance to drugs used as the primary line of management for TB, the WHO has embarked on a programme of directly supervised regimens using drugs where no resistance has been reported. These regimens are only to be used in areas specified as suffering from MDR TB. It is also important that the secondary drugs are not used routinely and sold across the counter in such areas to avoid the emergence of resistance to these drugs. This is called DOTS Plus.

**90. What is RNTCP?**

A. The National TB Control Programme has been revamped with the initiation of directly observed treatment regimes and an augmentation of outreach activities to increase the compliance of patients to recommended drugs. These new initiatives in the programme have resulted in the national programme now being called Revised National TB Control Programme.

**91. What do you understand by defaulter action?**

A. A patient who does not come back for drugs for one month from the due date for medicines is called as a person lost to treatment. A postcard is sent to the patient after a week of default and the patient's home is visited if the patient still does not come back. This is called defaulter action. With short course regimens default has decreased during the initial phase of treatment.

**92. Which year did the National TB Programme start? What are the main objectives and strategies under the Programme?**

A. The National TB Control Program started in 1963. It aims at systematic reduction of TB in the community within the available resources of the country, within a reasonable period of time. The short-term objective of the program is to diagnose and treat patients at places nearest to their homes and also to provide preventive services, especially in the rural areas to reduce disability and death to the extent possible. The long-term objective of the programme is to reduce the problem gradually till it ceases to be a public health problem.

**93. What is the prevalence rate of tuberculosis infection in India?**

A. The prevalence of TB infection is the percentage of individuals in the community showing positive reaction to tuberculin test. Its usefulness has decreased in recent years due to widespread BCG immunization. A third of the Indian population is infected.

**94. What do you understand by Annual Infection Rate in TB?**

A. This is also called the incidence of infection and tuberculin conversion index. It is the proportion of persons converting from tuberculin negative to positive in a particular year. Annual infection rate in infants and children is the best indicator of transmission of infection in a community. The prevalence rate of TB disease is 4 per 1000 population while the incidence rate of disease is 1 per 1000 population.

**95. How many radiologically active cases and how many sputum positive Tuberculosis cases can you expect in a population of a district with 1-2 million population?**

A. Each district is likely to have 20,000 radiologically active cases including 5000 sputum positive cases at any point in time. Annual incidence of new cases is expected to be 2000.

**96. Who is labeled as a case of tuberculosis?**

A. A case of TB is an individual who is sputum positive and is therefore capable of transmitting infection.

**97. What is the difference between a cases and a suspect of TB?**

A. A suspect is a person who is sputum negative but has radiological evidence of Tubercular shadows in the lungs. Therefore, a case is infectious while a 'suspect' is not infectious.

**100. What is a District TB Centre?**

A. A district is the nerve centre for TB control activities under the NTCP. All patients are registered with the District TB Centre and drugs are provided from here. All defaulter action in addition to maintenance of the live register is the responsibility of the District TB Centre.

**101. What is the danger signals signifying severe disease in Acute Respiratory Infections?**

A. Danger signals, which signify very severe disease, are:

- a. Child stops proper feeding
- b. Child too sleepy or difficult to wake up
- c. Stridor even when the child is calm.
- d. Wheezing
- e. Convulsions
- f. Severe malnutrition
- g. A very young infant who has fever or is cold to touch.

**102. Name some food-borne diseases and specify measures of control for these diseases?**

A. Common food-borne diseases are cholera, typhoid, amoebiasis, bacillary dysentery, taeniasis, trichinellosis, trichuriasis, hydatid cyst & food poisoning

**103. What is the incubation period of cholera?**

A. The incubation period for cholera ranges from 1 – 5 days. Most commonly it is 12 hours to 2 days.

**104. How can you differentiate cholera from food poisoning?**

A. The following table illustrates the differential diagnosis of cholera and food poisoning:

Symptom	Cholera	Food poisoning
Nausea, retching and stomach pain	Rare	Common
Vomiting	Watery, follows diarrhea	Contains food particles; precedes diarrhea
Diarrhea	Rice water stools	Fecal matter with offensive smell
Pain and griping	Absent	Present
Muscular cramps	Common	Rare
Urine	Often suppressed	No urinary suppression
Collapse	Common	Rare
Fever	Rare	Low grade
Toxemia	Marked	Rare
History of common meal	Rare	Common

### 105. What is ORT?

A. Oral Rehydration Therapy is the cornerstone of managing dehydration in diarrhea. It is estimated that it can save an estimated 4 million children dying from diarrhea every year. Some people differentiate between ORT and ORS. The constitution of packed physiological salts as a solution is called ORS while the preparation of home-made solutions for oral rehydration are referred to as Oral Rehydration Therapy.

The contents of the Oral Rehydration Salts solution approximate the water and electrolyte composition of diarrheal stool, which is isotonic in nature.

### 106. How can Oral rehydration fluid be made at home?

A. Home-made rehydration fluid can be made by adding sugar and salt to water. Eight heaped teaspoons of sugar and 1 level teaspoon of salt should be added to one litre of clean water. The salt and sugar should be dissolved completely.

The patient should be given as much of the solution as he can take comfortably. Small sips can be repeated at frequent intervals. Once the solution is prepared it should be consumed within 24 hours and whatever is left over should be discarded and not consumed after 24 days. Fresh solution should therefore be prepared everyday.

### 107. What is the composition of WHO formulated ORS?

A. The composition of standard WHO formulated

ORS is as follows:

– Sodium chloride: 3.5 grams – Sodium bicarbonate: 2.5 grams – Potassium chloride: 1.5 grams – Glucose: 20 grams  
 – Water: One litre This provides: 90 meq/litre of Sodium 20 meq/ litre of Potassium 80 meq/ litre of Chloride 30 meq/ litre of Bicarbonate ORS containing sodium bicarbonate has short shelf life in hot, humid conditions. Sodium bicarbonate reacts with glucose in the presence of dampness (water) and the powder becomes discoloured and less effective.

Therefore, replacing 2.5 grams of sodium bicarbonate with 2.9 grams of trisodium citrate increases stability of ORS and also reduces stool output.

### 108. How long can the ORS be used after preparation?

A. Once prepared, ORS should be consumed within 24 hours. After that period, whatever is left over should be discarded and fresh solution should be prepared.

### 109. What are the features of Salmonella food poisoning?

A. Salmonella food poisoning is characterized by an incubation period of 12-24 hours, abdominal pain,

diarrhea, vomiting and fever. The organisms most commonly multiply rapidly in animal foods like milk and milk preparations, meat, fish, eggs, ice creams, puddings, pastries, sausages and meat pies, etc. and so history of intake of such foods is elicited.

**110. What are the features of botulism?**

A. In botulism, change of voice, diplopia, ptosis, cranial nerve palsies and obstinate constipation are observed. History of consumption of tinned food is usually observed. An incubation period of 12-36 hours is seen. Death usually occurs in 3- 7 days and mortality is high (40%).

**111. Who is labeled as a convalescent carrier?**

A. A convalescent carrier is one who sheds infective micro-organisms during the period of convalescence. In typhoid this is for a period of 1-2 weeks after the temperature comes down.

**112. Who is called a permanent carrier?**

A. A permanent carrier is one who continues to shed organisms forever after the disease has been cured. This is seen in typhoid where the gall bladder and kidneys are involved and bacilli are passed for a long time with interspersed periods of remission. 2.5% of typhoid cases develop into permanent carriers.

**113. What is the incubation period of Typhoid?**

A. The commonly observed incubation period of typhoid is 10 – 14 days, but it can range from 4 – 21 days.

**114. What vaccines are used for active immunization against Typhoid?**

A. A number of vaccines are used for active immunization against typhoid. These include:

- TAB vaccine – AKD vaccine – Bivalent vaccines containing *S. typhi* and *S. paratyphi*
- Live attenuated oral vaccine (Ty 21a)

TAB vaccine is the earliest vaccine developed and was introduced in 1896. Live vaccines are now routinely used and are very effective and have less side effects compared to the killed vaccines.

**115. How many doses of oral typhoid vaccine are given for primary immunization?**

A. A single dose of oral vaccine provides long-term immunity. Booster doses should be given every 5 years.

**116. When should booster of acetone killed typhoid vaccine be given?**

A. Booster doses should be given every 3-5 years.

**117. What advice should you give to a person who is being given AKD typhoid vaccine?**

A. A person given AKD vaccine should not indulge in hard physical work on the day of injection as this may lead to more adverse reactions. Fever, myalgia and rash at the injection site are commonly seen. The myalgia can be debilitating and if the whole family is immunized at the same time, there may be nobody fit to cook for that night!! All these reactions are transient and go away within 24-36 hours.

**118. Who is the reservoir of infection in Amoebiasis?**

A. Man is the reservoir of infection in Amoebiasis.

**119. What is the difference in incubation period of hepatitis A and hepatitis B?**

A. The incubation period for hepatitis A is 15-50 days while it is 50-150 days for hepatitis B.

**120. What is surface antigen and how is it useful?**

A. The surface antigen in hepatitis B (HBsAg) can be detected in blood for several weeks before the onset of symptoms and persists for weeks or months. Its continued presence indicates a chronic infection.

**121. How is hepatitis B transmitted? How does this differ from other hepatitis causing viruses?**

A. Hepatitis B is transmitted through body fluids including blood and through sex where exchange of body fluids takes place. The routes of transmission can be categorized as follows:

- Parenteral or percutaneous: Through infected blood, blood products, syringes, transfusion apparatus, etc.
- Vertical or perinatal spread: Mother to infant transmission can occur when the mother is a chronic carrier or suffers from acute infection during the first trimester of pregnancy. The infection can also occur during passage through the birth canal or during the post-natal period due to close contact.
- Per mucosal spread: Blood, saliva, vaginal fluids and semen are infective.

**122. What is the incubation period of polio?**

A. The common incubation period is 7-14 days with an overall range of 3-35 days.

**123. How is the prevalence of polio estimated in the community?**

A. The prevalence of polio in the community is assessed by conducting lameness surveys in the community among children aged 0-10 years. Lameness in children aged 0-4 years is most indicative of the current level of the problem.



### 124. What are the different types of vaccines available for polio?

A. There are two types of vaccines available for prevention against polio – One is a killed vaccine and is injected (Salk vaccine) and the other is an live vaccine which is given orally (Sabin vaccine). The features of the two vaccines are as follows:

	Sabin (OPV)	Salk (IPV)
Development of immunity	Few days	Some weeks
Duration of immunity	At least 3 years	Uncertain
Antibody formation	40-60% acquire antibodies against types 1,2,3	80-90% acquire triple positivity
Reinfection by wild viruses	Not possible	Occurs
Use in controlling epidemics	Useful	Not useful
Manufacture	Easy	Relatively difficult
Cost	Cheaper	Costlier
Storage & transport	More care needed	Stringent conditions not needed
Administration	Easy oral dose	Injectable
Herd immunity	Live virus excreted for 4-6 weeks and can therefore immunize community	No role in community immunization

### 125. What is Pulse Polio programme?

A. The pulse polio programme is an initiative for eradication of polio from all the endemic areas.

Under this programme, in addition to the routine

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primary immunization with OPV given in early infancy, 3 doses are given to all children < 5 years of age at monthly intervals all over the country on the same days—these days are called the National Immunization days.

### 126. What is the Lepromin Test?

A. This test detects cell mediated immunity. It simply measures the individual susceptibility or resistance. It does not indicate past or present infection. Lepromin positivity is associated with resistance to leprosy infection. After intradermal injection of 0.1 ml of lepromin antigen, two types of reactions can be seen. These are referred to as the early (Fernandez), which is read at 48 hours and the late (Mitsuda) reaction, which is read at 21 days. The early reaction comprises of redness and induration and is regarded as positive if the area of redness is greater than 10 mm at 48 hours. The late reaction consists of a papule or nodule, which is first measured after 2 weeks, and then

at weekly intervals.

**127. What is the Indian classification of Leprosy?**

A. In the Indian classification, leprosy is categorized into one of five categories. These are indeterminate leprosy, tuberculoid leprosy, pure neuritic, border-line lepromatous and lepromatous. The first three categories fall under paucibacillary leprosy while the last two fall under multi-bacillary leprosy.

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**128. What is the rationale for MDT in Leprosy?**

A. MDT in leprosy is very useful because of the following reasons:

1. To interrupt transmission of the infection in the community as rapidly as possible using a combination of bactericidal drugs.
2. It provides an opportunity for cure
3. It helps to prevent drug resistance.
4. A shorter course of therapy ensures a better compliance
5. There is reduced work load on the health-care delivery system.

**129. What is paucibacillary leprosy?**

A. In this type of leprosy, there are few bacilli in the skin wounds and secretions and therefore such cases are of low infectivity.

**130. What is multibacillary leprosy?**

A. In multibacillary leprosy, the secretions and wounds are teeming with bacilli and these patients are therefore very infectious. Lesions in these patients progress much faster.

**131. What is bacteriological index?**

A. This index denotes change in the number of leprosy bacilli present in the tissues. Smears are made from at least 7 sites, including a nasal smear, both earlobes and 4 skin lesions. Each smear is graded separately. If there are no bacilli, a score of '0' is given while if bacilli are found in some fields (mean < 1 bacilli per field), it is scored as '1'; If bacilli are found in all fields it is scored as '2' and if many bacilli are found in all fields it

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is scored as '3'. All scores of all smears are added and a mean calculated. If the index is < 2, it is paucibacillary leprosy and if it is > 2 it is classified as multibacillary leprosy.

**132. What is morphological index?**

A. This index is the percentage of solid rods among 200 organisms counted in a smear stained for demonstrating *M. leprae*. Solid rods represent the viable bacilli. This index changes more rapidly than the bacteriological Index. If it shows a rise after an initial decline, it could indicate either

inadequate drug intake or development of drug resistance.

**133. What is the recommended treatment for multibacillary leprosy?**

A. The regimen recommended by WHO consists of the following:

- Rifampicin: 600 mg once every week as a supervised dose.
- Clofazimine: 300 mg once every 4 weeks under supervision + an unsupervised dose of 50 mg daily.
- Dapsone: 100 mg unsupervised every day.

Treatment continues for a minimum of 2 years and until the smears become negative after that.

**134. What are leprosy control units?**

A. These are established in endemic zones with a prevalence rate of 5 per 1000 and above and cover a rural population of 4-5 lakhs. There is a central leprosy clinic at the headquarters.

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**135. What are SET centers under NLEP and what are their functions?**

A. SET stands for survey, education and training and these are the main functions of these centers. These are established in endemic zones where prevalence rate is < 5 per 1000. Leprosy paramedical workers trained in physiotherapy, health education and treatment are posted in these centers and they function under the MO in charge of the PHC. The functions of these centers are:

- a. Detection of early cases based on a house-to-house survey.
- b. Health education
- c. Free treatment of all cases
- d. Contact tracing
- e. Chemoprophylaxis of contacts

**136. What are STDs?**

A. STDs are diseases in which sex plays an important part in transmission. They include the five classical diseases—syphilis, gonorrhoea, chancroid, LGV and granuloma inguinale and additional conditions like non gonococcal urethritis, herpes proies, genital warts, trichomoniasis and moniliasis. In addition, some diseases where sexual transmission is possible but not epidemiologically important are also considered as STDs.

These include genital scabies, hepatitis B, genital pediculosis and genital molluscum contagiosum.

**137. What is contact tracing?**

A. Sexual partners of STDs cases (also called conjugal partners) must be located, examined and

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treated. This helps in arresting the transmission

of disease. This process of identifying and following up the contacts is called contact tracing.

**138. What is partner notification?**

A. All cases of STDs are asked to name all their sexual partners from whom they could have contacted the disease or to whom they could have transmitted the disease. This process of identifying the sexual partners is called partner notification.

**139. What is the incubation period of gonorrhoea and how is the disease spread?**

A. The incubation period of gonorrhoea is 2-7 days. It is primarily spread by sexual intercourse. The chance of contracting gonorrhoea after a single exposure is 20-35% for men and probably double for women.

**140. What is AIDS and how is it caused?**

A. AIDS is Acquired Immunodeficiency Syndrome and is caused by a retrovirus called Human Immunodeficiency Virus. The different routes of transmission of this communicable disease are:

- a. Sexual transmission – both hetero- and homosexual.
- b. Transfusion of infected blood
- c. Sharing needles and syringes by intravenous drug users.
- d. Transplacental – during pregnancy
- e. Through breastfeeding

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**141. When was the National AIDS Control Programme initiated and what activities are undertaken?**

A. The National AIDS Control Programme started in 1992 and has multifaceted activities. The major component activities under the program are:

- a. Modernizing blood banks to ensure safe blood transfusion
- b. IEC to increase awareness and motivate people to practice safe sex
- c. Sentinel surveillance
- d. Condom programming
- e. Strengthening of STD services
- f. Training of different categories of personnel
- g. Provide care and support to persons afflicted with HIV/ AIDS
- h. Ensuring human rights and dignity of people living with HIV/AIDS
- i. Operational Research
- j. Prevention of Mother to Child Transmission
- k. Identification and support to NGOs to mount targeted interventions in high risk and bridge populations.

**142. Which are the high prevalence states for HIV in India?**

A. There are six high prevalence States in India. These are Andhra Pradesh, Maharashtra,

Tamilnadu, Karnataka, Nagaland and Manipur.

**143. What is sentinel surveillance for HIV/AIDS?**

A. Every year specified number of patients attending selected STD clinics and antenatal clinics in all States and high risk populations like

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men having sex with men and Injecting Drug Users are screened for HIV. These figures, especially from the antenatal clinics, are used to categorize the country into high and low prevalence. States with median prevalence > 1% among antenatal women are classified as the high prevalence States.

**144. What are behavioral surveillance surveys?**

A. HIV/ AIDS, like some other diseases, is closely related to human behavior and therefore monitoring of trends in behavior related to sexual practices helps in identifying which communities need priority attention. Such surveys are called Behavioral Surveillance Surveys.

**145. What is the PMTCT programme?**

A. The Prevention of Mother to Child Transmission is an important component of the National AIDS Control Program. All district hospitals in the high prevalence States and all Medical Colleges in the low prevalence States are to be initially covered under this program. All antenatal mothers are offered voluntary testing for HIV and those who are positive are given a course of antiretroviral drugs during pregnancy to prevent transmission from an infected mother to the unborn child. Ultimately, it is proposed to cover all district hospitals in the country.

**146. What are the most common modes of transmission of HIV in India?**

A. The most common mode of transmission of HIV in India is through hetero-sexual route. The other

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important routes are through blood transfusion, injecting drug use and mother-to-child transmission.

**147. What is Microfilaria rate?**

A. The number of persons whose peripheral blood smear shows microfilaria for every 100 such individuals tested is called the Microfilaria rate. In routine surveys, 5-7% of the population is examined while in evaluation surveys 20% of the population is screened.

**148. How is filariasis transmitted?**

A. Mosquito bites are the principal mode of transmission of filariasis. Transmission is remarkably inefficient. In an endemic area, about 100,000 mosquito bites are required annually to



produce one new case of filariasis.

**149. How can an epidemic of dengue fever be controlled?**

A. Mosquito control measures aimed at preventing breeding, killing of larvae and adults and avoiding mosquito bites is essential. The infected person should be confined to the house and kept in a mosquito net if possible to prevent transmission of infection during the first five days when the person is infective. Health education to protect themselves against mosquito bites is important.

**150. What species are the primary hosts in Japanese encephalitis?**

A. Pigs and birds are primary hosts of Japanese encephalitis. The infection in man is a dead end infection.

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**151. Why does JE spread to man?**

A. The major reasons which prompt the spread of JE to man are as follows:

- a. Relative abundance of vectors.
- b. Density and absolute number of infected mosquitoes.
- c. Adequate man-mosquito contact.
- d. Longevity of the vector.
- e. Adoption of extensive paddy cultivation
- f. Establishment of large modern piggeries.
- g. Climatic factors.
- h. Presence of amplifying hosts.

**152. Why is JE vaccine not very useful in controlling an epidemic?**

A. The usefulness of JE vaccine in controlling an epidemic is limited because of the following reasons:

- a. Requirement of multiple doses to attain immunity.
- b. Time lag required for developing immunity
- c. Need to have 80-90% coverage of the population to control an epidemic.

**153. What is the incubation period of plague?**

A. The incubation period of plague is 3-4 days.

**154. Which form of human plague is infectious and why?**

A. Pneumonic plague is infectious and is responsible for man-to-man spread. Other forms of plague are only transmitted through bite of a rat flea which is infective for a few months under suitable conditions. Man-to-man transmission can

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also sometimes occur when a person comes in contact with suppurated bubos.

**155. What steps should be taken to control an**

### **epidemic of plague?**

- A. The following steps should be followed for control of plague in man:
- Notification: Continuous surveillance of human and rat plague and its immediate notification.
  - Isolation in cases of pneumonic plague.
  - Suspected contacts should be quarantined for 6 days. This also applies to vessels and planes coming from plague infected areas.
  - All unusual rat falls should be investigated and dead rats should be dissected for microscopic evidence of plague.
  - Prompt treatment with antibiotics like streptomycin, chloramphenicol, etc. should be instituted.
  - Chemoprophylaxis should be instituted for contacts.
  - Adequate disinfection measures should be instituted. Safe disposal of sputum and proper boiling of patient's clothes should be undertaken.
  - Insecticidal spraying of affected areas.
  - Rat burrows should be treated with DDT.
  - Mass inoculation with plague vaccine.
  - Health education measures.
  - Information to WHO on a day-to-day basis.

### **156. What are the arboviral diseases seen in India?**

- A. More than 40 arboviral diseases are seen in India. Common arboviral diseases seen in India include:

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- JE
- Dengue
- Dengue hemorrhagic fever
- Kyasunur forest disease
- Sandfly fever

### **157. How is epidemic typhus transmitted?**

- A. The body louse or head louse becomes infected 3 days after sucking the blood of a typhus patient. Infection enters the human host when crushed louse or its feces are rubbed on the skin, especially over a wound or a scratch. Inhalation of louse feces or dust may account for some infections. Conjunctival transmission may also occur.

### **158. What is the causative organism for rabies and what is its incubation period?**

- A. Rabies is caused by Lyssavirus type 1, a neurotropic virus belonging to the family of Rhabdoviruses. The incubation period is usually between 2-8 weeks.

### **159. What should you do when a patient comes with a history of a dog bite by an unknown dog?**

- A. After being bitten by any unknown animal the following steps should be undertaken:

- a. Exact wound should be carefully examined. It should be seen whether there are true bite marks on the skin or whether the clothes prevented a bite. If the bite has not penetrated through the clothes, vaccine is not necessary.
- b. Local treatment: Should be washed thoroughly with water and 20% soap solution. It should then be washed with savlon.

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- c. Topical application and infiltration of 5 ml hyperimmune antirabies serum or gamma globulin should be done.
- d. Wounds should not be sutured. If sutures are essential, loose sutures should be applied.
- e. Anti-tetanus serum or a booster dose of TT should be given if the person gives a history of previous immunization.
- f. Antirabies vaccine should be instituted.

**160. What are the different types of antirabies vaccines?**

A. The different types of antirabies vaccines are as follows:

- a. Nerve tissue vaccines: Semple's vaccine, etc.
- b. Avian embryo vaccine: Chick or duck embryo vaccines
- c. Primary cell culture vaccines: Human diploid cell vaccine.

**161. What is the schedule for Purified Chick embryo cell culture vaccine?**

A. The dosage depends on whether it is pre exposure or post exposure prophylaxis. For pre exposure prophylaxis, 3 doses are given at weekly intervals followed by a 4th dose 1-3 months after the last primary dose. A booster is repeated every 2 years. For post exposure prophylaxis, the vaccine is given on days 0, 3, 7, 14, 30 and 90 days after exposure.

**162. How is Antirabies serum given after a dog bite?**

A. In all severe bites (Class III), serum should be started immediately. This is done by antirabies

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serum or rabies immune globulin(RIG). The dose is 20 i.u. per Kg body weight (RIG) and 40 i.u. per Kg. Body weight if it is animal serum. This is given as a single dose. If the patient is seen within 24 hours, part of the dose should be infiltrated locally and the rest given intramuscularly.

**163. What is pre-exposure prophylaxis in Rabies?**

A. Pre-exposure prophylaxis is given in cases of persons who are at high risk of infection such as dog catchers, veterinary personnel and lab workers. Three doses of Purified embryo vaccines or Human Diploid Cell vaccines are used. Semple

vaccine should not be used for pre-exposure prophylaxis because of the risk of side effects.

**164. What is Anthrax and how is it transmitted?**

A. Anthrax is primarily a disease of animals and occurs in man in 3 forms: Cutaneous form (in hide handlers), pulmonary form (wool sorters disease) and intestinal form. Pulmonary form can also occur by inhalation of anthrax spores and this is also used as a method of biological warfare.

**165. What measures should be taken to prevent tetanus after a person comes with a road traffic accident?**

A. Road traffic accidents cause dirty wounds which have a potential to be infected with tetanus spores. Therefore, aggressive treatment is necessary to prevent tetanus. The following steps should be undertaken immediately:

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a. The wound should be thoroughly washed with plenty of water to wash the spores away. If necessary, debrediment should be done under asepsis.

b. If the wound is severe or if there is a compound fracture, tetanus antiserum should be administered. Tetanus Immune Globulin is safer. It should, however, be given as soon as possible and not later than 24 hours after the injury. If TIG is not available, equine ATS can be given, but this can lead to hypersensitivity. Its use should therefore not be done routinely for every road traffic accident.

c. A booster dose of tetanus toxoid gives immediate protection if there is a previous history of completed immunization. Otherwise, a primary course of immunization should be initiated.

d. Secondary infection is common after such injuries. Therefore, antibiotic cover to prevent such infections should be started.

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# 4

## Non-communicable Diseases

**166. What are the major non-communicable diseases seen in India?**

A. The major non-communicable diseases seen in

India are cancers, hypertension, coronary arterial disease, diabetes, blindness, depression, psychosomatic disorders, accidents and addiction (including smoking and alcoholism).

**167. How does the epidemiology of noncommunicable diseases differ from common communicable diseases in India?**

A. The differences between communicable and noncommunicable diseases in India, in general, are as follows:

a. Most of the non-communicable diseases in India affect the middle-aged and aged populations while communicable disease affect all age groups.

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b. Most non-communicable diseases are more prevalent in urban areas

c. Lifestyle and habits are important etiological factors for many non-communicable diseases in India.

d. Most non-communicable diseases in India are chronic onset diseases.

**168. How is blindness defined?**

A. Blindness can be defined in two ways:

a. As defined by the National Program for Control of Blindness in India

b. As defined by the WHO.

The National Program defines a person as blind if he/ she cannot see the top line of the Snellen's chart (or fingers) clearly, from a distance of 6 metres, with both the eyes tested independently, or if the field of vision is reduced to < 20 degrees around central fixation.

The WHO defines a person as blind if the top line of the Snellen's chart cannot be read from a distance of 3 metres or if the field of vision is < 10 degrees around central fixation.

For estimating the prevalence of blindness at community level, generally the field of vision is not considered.

Though theoretically best corrected vision should be considered, since this is generally not possible in a survey, presenting vision (vision with glasses if a person is routinely using the same or without glasses if a person is not wearing glasses regularly) is considered.

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**169. What are the common causes of blindness in India?**

A. The most common cause of blindness in India is cataract. Surveys in the country show that cataract is responsible for 55-80% of blindness in India. The other important causes are uncorrected refractive



errors, glaucoma, corneal scars (including trachoma) and childhood blindness (due to vitamin A deficiency, measles, congenital causes, retinopathy of prematurity, etc.).

**170. What is avoidable blindness?**

A. Blindness which is either curable (treatable) or preventable is called avoidable blindness as it can be completely avoided.

**171. What are the most common cancers among males in India?**

A. Cancers of the stomach, rectum, colon, esophagus and oral cavity are the most common cancers among males in India.

**172. What are the most common cancers among females in India?**

A. Cancers of the uterus (including cervical cancers) and breast are the most common cancers among women in India.

**173. What are the components of the National Cancer Control Programme?**

A. The National Cancer Control Program has the following components:

a. Control of tobacco related cancers using a primary prevention approach. This also includes effective anti-tobacco control measures.

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b. Early detection, diagnosis and treatment of cervical and oral cancers.

c. Augmentation of therapeutic facilities.

d. Research

e. Evaluation of the strategies adopted under the program.

**174. What is a Cancer Registry?**

A. A cancer registry is a facility which records all cancer cases occurring in a specified area. There are two types of registries—the hospital based and the population based-registries. The hospital based-registries maintain a live register of all cases diagnosed in hospitals treating cancers in a defined catchment area. The population basedregistries record all cases within a specified geographic area and also undertake follow-up activities to provide information on mortality and survival patterns in different cancers. Under the National Cancer Registry Project both hospital and population-based-registries have been setup. The first registry was se up at Mumbai. Registries have been subsequently setup at Bangalore, Chennai, Tiruvanathapuram, Delhi and Bhopal.

**175. How does hardness of water affect cardiovascular system?**

A. Hard water is hypothesized to protect against Ischemic Heart Disease. Such water tends to have a higher content of nitrate, carbonate, calcium and

silica and these elements are postulated to have a protective effect.

# 5

## Family Welfare

### **176. What is the difference between family planning and family welfare?**

A. Family planning refers to a gamut of activities that are intended to avoid unwanted births, bring about wanted births, regulate intervals between births and to determine number of children in a family. As against this, family welfare refers to a comprehensive package of services which in addition to all elements of family planning also includes activities directed towards child survival like immunization, reduction of low birth weight, safe deliveries, etc. simply, put, family welfare is FP + MCH .

### **177. What are barrier methods of contraception?**

A. Barrier methods of contraception are those methods which act as a physical or chemical barrier and prevent the sperm from reaching the ovum. These include condoms, diaphragms, foam tablets, jellies, creams, suppositories, soluble films and vaginal sponges.

### **178. What is a mini pill?**

A. The mini pill contains only progestin and no

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estrogen as in a combined pill. The progestin makes the cervical mucus thick and impenetrable to sperm and induces a thin atrophic endometrium. These pills are taken continuously.

### **179. What is a combined pill?**

A. These pills contain a mixture of estrogen and progestin in concentration which are physiologically compatible. This is the most common type of pills used nowadays. Sequential pills were used earlier where estrogen alone was given in the first half of the cycle and estrogen and progestin in the second half. Nowadays both are given together for 21 days (with a placebo for the remaining period of the month). The first time it is started on the 5th day of the cycle and continued for 21 days.

Estrogen is a powerful inhibitor of ovulation while progesterones mainly regulate menstruation by acting on the endometrium.

### **180. What are the side effects of oral contraceptives?**

A. The main side effects include:

- a. Headache
- b. Nausea
- c. Vomiting
- d. Breast tenderness
- e. Weight gain
- f. Inter period spotting

Other side effects include:

- g. Increased risk of cardiovascular disease.
- h. Hypertension
- i. Increased risk of gall bladder disease

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- j. Decreased quantity of breast milk.

### **181. What is mini lap tubal ligation?**

A. In this procedure tubal ligation is done through a very small abdominal incision. Laparoscopic tubal ligation by the trans-abdominal route is now popular as recovery is very fast.

### **182. What is Non Scalpel Vasectomy?**

A. This is a new method of male sterilization which is currently being actively promoted by the WHO.

The procedure uses a fixation clamp which is used to grasp the vas deferens from outside the scrotal skin and a vas dissecting clamp which is used to make a puncture into the skin overlying the fixed vas. At the end of the procedure, sutures are not needed and the small puncture hole is covered by a small piece of gauze. This method is superior to conventional vasectomy because of:

- a. It eliminates the fear of a big surgical incision
- b. It is much quicker to perform
- c. It has fewer complications

### **183. What is the failure rate of different contraceptives?**

A. Failure rate is defined as the number of pregnancies per 100 users in the first year of typical (regular use). The failure rate for different contraceptives are as follows:

Contraceptive Failure rate

Combined pills 1-8

Mini pills 3-10

Injectable contraceptives  $\leq 1$

Contraceptive implants 0 – 2

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IUD  $< 1$

Tubal ligation 0.2 – 1

Vasectomy 0.15 – 1

Condom 5 – 20

Diaphragm 5 – 25

Spermicidal jellies/creams 10 – 30

Sexual abstinence 10 – 30

Coitus interruptus 5 – 25

### **184. What are spermicides?**

A. Spermicides are barrier contraceptives which kill or immobilize sperms on contact. Used alone,

they have a high failure rate. The failure rate can be reduced by combining the spermicides with other barrier methods like a condom.

**185. What is Copper T?**

A. Copper T is a second generation Intra Uterine device. Copper T – 200, in which the surface area of copper is 200 sq. mm, is in common use in most developing countries. It has to be replaced every 2-3 years.

**186. What is the mode of action of an IUD?**

A. The exact mechanism of action of IUD is still not clear. The ways in which it acts include:

- a. Act as a foreign body in the uterus
- b. Cause cellular and biochemical changes in the endometrium and the uterine fluids
- c. Lead to changes which reduce the viability of the ovum and chance of its fertilization

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d. Copper ions impair sperm motility and viability.

**187. What are the most common complications of an IUD?**

A. The most common complications include:

- a. Bleeding which may be midcycle or intermenstrual bleeding, greater volume of flow and longer menstrual periods
- b. Pain which is the second most common complication after bleeding. This may be manifested as low backache, abdominal cramps or pain down the thighs
- c. Expulsion in 5-15% cases
- d. Pelvic infection: This is 2-8 times commoner in women with an IUD
- e. Perforation of uterus in 0.3%
- f. Failure leading to pregnancy in 2 per 100 women years of exposure.

**188. What are injectable contraceptives?**

A. Injectable contraceptives are one of the most effective reversible contraceptives. They contain synthetic progestins and are administered once every 3 months. Two preparations are available – DMPA (Depomedroxy progesterone acetate) and NET-EN (Nor ethindrone enanthate). DMPA has been used more commonly.

**189. What is Depo Provera and how does it act?**

A. Depo Provera is DMPA (Depomedroxy progesterone acetate), an injectable contraceptive. It prevents pregnancy by suppressing ovulation, inducing a thin atrophic endometrium and causing thick cervical mucus which is impenetrable to sperms. 150 mg. is given every 3 months.

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**190. What is the MTP Act?**

A. The MTP Act refers to the Medical Termination

of Pregnancy Act which was passed by Parliament in 1971. Under this Act, the considerations for termination of pregnancy include:

- a. Therapeutic when the continuation of the pregnancy endangers the life of the woman
- b. Eugenic when there is a risk of the child being born with serious physical or mental handicap.
- c. Humanitarian when pregnancy has been caused by rape
- d. Social when pregnancy has resulted from contraceptive failure or there is a risk to the other due to environmental conditions.

Pregnancy can only be terminated by a qualified registered medical practitioner possessing prescribed experience after obtaining written consent from the woman. If the period of pregnancy is between 12-20 weeks two doctors must concur that there is an indication. The law does not permit MTP beyond 20 weeks.

**191. What are conventional contraceptives?**

A. Contraceptives needing action at or just prior to the intercourse are called conventional contraceptives. Physical and chemical barrier contraceptives generally belong to this category.

**192. What are the major gains of the National Family Welfare Programme?**

- A. The major gains include:
- a. Cafeteria approach for consumers who can pick any method they feel is appropriate
  - b. Lack of force or coercion
  - c. Improved child survival
  - d. Reduced maternal mortality and mortality
  - e. Efforts at stabilization of the population
  - f. Improved status of women in society
  - g. Improved socioeconomic status of many families in the country.

**193. What is Equivalent Sterilization?**

A. This is an index of overall family planning performance calculated by adding the number of sterilizations performed over a period of time, one third the number of IUD insertions, one eighteenth the number of conventional contraceptive users and one ninth the number of oral contraceptive users. These weights are derived from an assessment of the number of births averted by different contraceptive methods in India.

**194. What is the hospital post partum programme?**

A. The all India hospital post partum programme was initiated in 1969. It is a maternity center/hospital based approach to family welfare. The rationale of the program is as follows:

- a. Women who have recently delivered are at high risk of getting pregnant again



- b. They are a captive audience
- c. They are most receptive to advice on family planning immediately after delivery.

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# 6

## Population and Demography

### 195. What is demographic transition?

A. Demographic transition comprises of stages through which countries pass in their history from a situation of high birth rate and high death rate to a situation of low birth rate and low death rate.

There are five stages in this transition:

- a. High stationary stage: High birth rate and high death rate
- b. Early expanding: High birth rate but declining death rate
- c. Late expanding: Birth rate starts declining while death rate declines much faster
- d. Low stationary: Stable population characterized by low birth and death rates
- e. Declining: Birth rate is lower than the death rate

### 196. What is the population of India?

A. The population of India as per the 2001 census is rightly above one billion.

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### 197. What are the causes for population explosion in India?

A. The causes for population explosion in India are:

- a. Marginal reduction in birth rate as against a steep decline in death rates
- b. High Infant mortality and child mortality leads couples to have larger families to ensure survival of a few
- c. Preference for a male child leads to a number of children being born in the quest for a male child
- d. Need of more hands to work in the farms to conserve resources within the families
- e. Young age at marriage
- f. Early onset of procreation
- g. Acceptance of child birth as God's gift
- h. Poor literacy and economic status

### 198. What is growth rate?

A. Growth rate is the net difference between the crude birth and death rate in any country. It tells us how many more people are being added to

the population every year.

**199. What is negative growth? Name some countries which show negative growth rate in the world**

A. When the birth rate falls below the death rate, there is no addition to the population but only a decrease of the population. Such a situation is called negative growth rate. Many Scandinavian countries and other countries in Western Europe have entered into the last stage of the demographic transition. Sweden and Hungary are examples of such countries.

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**200. What is Net Reproduction Rate?**

A. Net Reproduction Rate is defined as the average number of daughters that would be born to a woman if she experiences the current fertility and mortality patterns throughout her reproductive span (15-49 years). The target for India is an NRR of 1 which means that 1 daughter will replace her mother. This will enable population stabilization to occur.

**201. How is Crude Birth rate defined? What is the current Crude Birth Rate in India?**

A. Crude birth rate refers to the number of live births which occurred in the population of a given geographic area during a given year among the mid-year total population of the same area during the same period. It is expressed as per 1000 population. The crude birth rate in India is 25 per 1000 population.

**202. What is sex ratio?**

A. The number of females per 1000 males is called the sex ratio. Biologically, female of the species is stronger and has a higher life expectancy and therefore there should be more females per 1000 males. In India the sex ratio is 933 females per 1000 males which is an adverse sex ratio and indicates discrimination against women. Only Kerala has more females per 1000 males in the country.

**203. What is life expectancy at birth in India?**

A. The life expectancy at birth in India currently is 64 years.

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**204. What is the current crude death rate in India?**

A. The crude death rate in India is 9 per 1000 population

**205. What are the salient features of the National Population Policy?**

A. The salient features of the National Population Policy are:

a. MCH and Family Planning services stand merged with health.

- b. No targets for specific contraceptive methods.
- c. The only target will be achievement of national average of Total Fertility Rate of 2.1 by the year 2010.
- d. Incentives for family planning acceptors to be discontinued.
- e. NGO involvement in the programme promoted.
- f. IEC activities to be implemented
- g. Reduction in the incidence of girls below 18 getting married to zero.
- h. Increase in percentage of deliveries conducted by trained personnel.
- i. Reduction of maternal mortality rate to < 100 per 100,000 live births.
- j. Universal immunization.
- k. Reduction of IMR to < 30 per 1000 and a sharp decline in Child Mortality Rate.
- l Universal access to quality contraceptive services.
- m. Containment of HIV/AIDS and STDs.

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# 7

## Health Care Administration

**206. What is a policy and how does it differ from a plan or programme?**

A. Policy refers to the statement of intent i.e. what does the government intend to do or what is the general direction in which the country should move. A program refers to the sequence of activities designed to implement a plan. A plan is the composite total of all objectives, strategies and monitoring tools that is meant to produce a desirable result.

**207. What is the difference between goal and objective?**

A. Goals are the ultimate aim of any program – The ideal for which one strives. They may not always be achievable but they shine like a beacon light and allow one to chart a course of action to reach the goal. An objective is more realistic and

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quantifies what output is desirable at the end of a specific time duration. Thus objectives always have an end point and have a dimension of time.

**208. What is Effectiveness?**

A. Effectiveness is the quantum of change that has been brought about by an activity as compared to the change desired during a specific time period. How much has been achieved (or magnitude reduced) out of what was desired to be achieved is called effectiveness. It is like a milestone on the highway which tells us how far we have covered on our journey towards achieving what we set out to do.

**209. What is Efficiency?**

A. Efficiency denotes the ratio of output to inputs. Efficiency is dependent on output and the resources (including time and money) that were expended in achieving an impact. The total output that has been achieved divided by the cost (or other resources) incurred in undertaking the activity is defined as efficiency.

**210. What is the difference between cost benefit and cost effectiveness?**

A. In cost benefit analysis, the monetary value (financial value) of the benefits accruing from a specific activity and the cost that has been incurred in undertaking the activity are considered. Therefore, both the cost and the benefit are weighed in monetary terms. As against this, in cost effectiveness analysis, money incurred in undertaking an activity is costed while

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the effectiveness of the intervention is measured in non-financial terms (no. of deaths averted, no. of children protected against measles, etc.). This is more popular in health as the effectiveness of all interventions in the health sector cannot be measured in financial terms.

**211. What are five year plans?**

A. For socio-economic development of the country within a short time perspective, the Government allocates resources for a five-year period. Specific objectives and measurable outputs are set up which have to be achieved by the resources provided for the same. The Planning Commission was set up in 1950 for the purpose of appropriate planning for India's development within the resources available. Five-year developmental plans were drafted for the first time in 1950-51. The Ninth Plan was completed in 2002 and the Tenth plan is currently under way from 2002-2003.

**212. What is Minimum Needs Programme?**

A. The Minimum Needs Programme is the main plank for developmental plans in the country. This includes a set of activities which are needed to be implemented to bring about a change in the country. The different components of the

MNP include:

- a. Rural Health
- b. Rural Water supply
- c. Nutrition
- d. Elementary education

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- e. Adult education
- f. Housing for landless laborers
- g. Environmental improvement of slums
- h. Rural electrification

**213. What was Bhore Committee?**

A. This Committee, also known as the Health Survey and Development Committee, was set up in 1943 under the Chairmanship of Sir Joseph Bhore for structuring of the health services in the country. It laid emphasis on integration of curative and preventive medicine at all levels and recommended a network of primary health centers.

**214. What was the Mudaliar Committee?**

A. The Mudaliar Committee was known as the Health Survey and Planning Committee and was set up in 1962 to assess the performance of the health sector since the submission of the Bhore Committee report. The Committee suggested strengthening of the existing PHCs before new PHCs were opened. Strengthening the subdivisional and district hospitals was also advised.

**215. What was the Kartar Singh Committee?**

A. This committee was also called the committee on multipurpose workers under Health and Family Planning. It was constituted to form a framework for integration of health and medical services at peripheral and supervisory levels.

**216. What is the ROME scheme?**

A. The Reorientation of Medical Education scheme was launched in 1975 to determine the steps needed to reorient medical education in

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accordance with national needs and priorities.

The recommendations for the same were made by the Shrivastava Committee.

**217. What is the doctor population ratio in India?**

A. The doctor; population ratio in India is 1: 3500.

**218. What subjects are covered under the Concurrent list in India?**

A. The subjects covered under the Concurrent list are:

- a. Inter-state spread of disease
- b. Prevention of food adulteration
- c. Control of drugs and poisons
- d. Vital statistics
- e. Labour welfare
- f. Minor ports



g. Population control and family planning

h. Social and economic planning

**219. What is the Physical Quality of Life Index?**

A. Three elements together constitute the Physical Quality of Life Index (PQLI):

a. Infant mortality rate

b. Life expectancy at birth

c. Literacy rate

A. PQLI is used to grade the quality of life in different countries of the world.

**220. How is the poverty line defined in India?**

A. The poverty in India is defined as the amount of money required to provide for a diet of 2400 calories in the rural area and the families who cannot afford this amount of money to spend on food are said to be below the poverty line.

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**221. What is DALY?**

A. DALY is an abbreviation for Disability Adjusted Life Years and is used to measure the duration of life which is free of any disability. This therefore denotes what proportion of our population leads a healthy life.

**222. What are the three levels of health care in India?**

A. The three levels of health care in India are:

a. Primary health care: Essential health care provided at the first level of contact of people with the general health services.

b. Secondary health care: Intermediate level of health care where specialist facilities are available

c. Tertiary level: Highest level of health care where super specialty services are available.

**223. What are the functions of a PHC in India?**

A. The functions of a PHC in India include:

a. Medical care including referral and lab services

b. Control of communicable diseases

c. Environmental sanitation and safe water supply

d. MCH

e. Family Planning

f. School Health Services

g. Health Education

h. Collection of vital statistics

i. Implementing National Health Programs

j. Training of personnel

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**224. What is the staffing pattern of a new Primary Health Centre?**

A. A new PHC caters to a population of 30,000 and has the following complement of staff:

a. Medical Officer: One

b. Community Health Officer: One

c. Pharmacist: One

- d. Nurse Mid wife: One
  - e. ANM: One
  - f. Health Educator: One
  - g. Health Assistant (Male): One
  - h. Health Assistant (Female): One
  - i. UDC: One
  - j. LDC: One
  - k. Lab Technician: One
  - l. Driver (Subject to availability of vehicle): One
  - m. Class IV: One
- Total: 16

**225. What is the staffing pattern of a CHC?**

- A. The following staffing pattern has been recommended for a CHC:
- Specialists (Med, Sur, Gyn, Ped): Four
  - GDMO (One each trained in anaesthesia, Public Health & ISM): Three
  - Nurses: Three
  - Pharmacist: One
  - Lab Technician: One
  - X-Ray Technician: One
  - Ward Attendants (Male & Female): Eight
  - Sweepers (Male and Female): Eight
  - Driver: One
  - Others: Twelve

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**226. How much population is covered by a subcentre and who are the health functionaries at the subcentre level?**

A. Each sub-centre covers a population of 5000 and each subcenter is manned by one male and one female health worker. In addition a voluntary worker helps the other staff at the subcenter.

**227. What is the Community Health Volunteers scheme?**

A. This is also called the Health Guides Scheme and is operational in most states. The person is envisaged as somebody from within the community and is a permanent resident of the village. This person should be acceptable to all sections in the village and should have been educated to at least the 6th class and be able to spend 2-3 hours everyday on health-related activities. The person is given a 3 months training at the PHC and is paid an honorarium.

**228. What are the major duties of a medical officer at the PHC?**

- A. The major duties of the MO include:
- OPD and Indoor services
  - Medico-legal cases
  - Attending to emergencies
  - Organizing lab services at PHC
  - Assist in referral services
  - Supervise all subordinate staff

- Report preparation
- Liaison with other functionaries at the district level
- Managing supplies and stores.

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#### **229. What is the trained dai scheme?**

A. Under this scheme all the untrained dais who routinely conduct deliveries in the villages are provided a short orientation and provided a kit for safe delivery. The target is to train one dai per 1000 population. The training is of a month's duration at the local PHC.

#### **230. What is a dai kit?**

A. After training the dai is provided with a kit for safe delivery. This includes fresh blades and cord tie. In addition, antiseptic application for the cord stump and antibiotics for prevention of ophthalmia neonatorum are also provided.

#### **231. What are the significant recommendations of the Krishnan Committee?**

- A. These include:
- a. Creation of organized health services to urban populations where more than 40% live in slum like conditions.
  - b. Creation of 4 types of health posts
  - c. The 4 types cover populations of 5000, 5000-10000, 10000-25000 and 25000-50000.
  - d. Staffing pattern is dependent on the type of facility

#### **232. What are the components of School Health Programme?**

- A. The major components of the school health programme are:
- a. Health teaching including diets, sanitation, personal hygiene and general cleanliness
  - b. Health education

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- c. Maintenance of healthy school environment including safe water supply, adequate drainage, ventilation, garbage disposal, latrines and playgrounds.
- d. Comprehensive student health care including preventive, promotive, curative and rehabilitative aspects.
- e. Periodic medical examination including dental and eye examination.

#### **233. What is Juvenile delinquency?**

A. Juvenile delinquency is defined as antisocial behavior on the part of boys and girls, less than 18 years of age that is not accepted by society and calls for some kind of admonishment, punishment or corrective measures. This can be caused by mental deficiency, organic brain

disease, manifest psychiatric disorder, adverse home and social conditions, poor inter personal relationships within the family and parental rejection.

**234. What are the objectives of the National Mental Health Programme?**

A. The objectives of the National Mental Health Program include:

- a. Ensuring availability and accessibility of minimum mental health care for all, particularly for the vulnerable and underprivileged sections of the populations.
- b. Encouraging application of mental health knowledge in general health care and in social development.

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- c. Promote community participation in mental health services.

**235. What is primary health care?**

A. Primary health-care has been defined by WHO as essential health care made universally accessible to individuals and acceptable to them, through their full participation and at a cost that the country and community can afford. It forms an integral part of the community's health system and of the overall social and economic development of the country. It is the first level of contact for individuals with the national health system and should be accessible and affordable to all segments of society. It enables individuals within the community to attain a level of health that would allow them to earn their livelihood and lead a socially and economically productive life. It is the key to attain the goal of Health for All.

**236. What are the essential elements of primary health care?**

A. The minimal essential elements of primary health care include:

- a. Education concerning prevailing common health problems and the methods of preventing and controlling them
- b. Promotion of food supplies and proper nutrition
- c. Provision of basic sanitation facilities and adequate quantity of safe drinking water
- d. Maternal and child health care including family planning

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- e. Immunization against major infectious diseases
- f. Prevention and control of locally endemic diseases
- g. Appropriate treatment of common ailments and

injuries

h. Provision of essential drugs

**237. What is Health for All?**

A. Health for All aims to provide a set of health-related services to all individuals in society to enable them to be in positive health and free from disease. Such a state will allow individuals to function optimally and earn their livelihood. Access to health should be equitable and nobody should be denied basic services because of their inability to pay for their health. Community participation should be encouraged so that populations are provided skills to take care of their own health. Primary health care has been identified as the key to Health for All.

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# 8

## Nutrition

**238. What is PEM?**

A. PEM is the short form for Protein Energy Malnutrition. This is a state of nutritional deficiency where both energy and protein needs of the body are not met sufficiently by the available dietary intake. This is the commonest form of malnutrition found in India and other countries. Its incidence is highest in childhood. Children having weight for age less than 60% of the standard are severely malnourished. Prevalence of severe malnutrition in preschool children is about 5% in India.

**239. Which type of PEM do we see more commonly in India**

A. Mild malnutrition [weight below 80% of the reference weight for age] and moderate malnutrition [weight below 70% of the reference weight for age] are more common than severe PEM which is defined as weight below 60% of

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the reference weight for age. The general trend in nutritional status surveys of preschool children in India is that about 20% are normal, 40% have mild or grade I malnutrition, 35% have moderate or grade II malnutrition, while 5% have severe or grade III malnutrition.

**240. What is the difference between Marasmus and Kwashiorkor?**

A. Marasmus is pure energy deficiency without protein deficiency. Kwashiorkor is pure protein



deficiency while energy intake is adequate. Both these forms of malnutrition are much less common than PEM. Marasmus presents as thin, skinny emaciated child with hanging skin folds, head apparently larger than the thin body, giving a wizened [like a wise person] appearance to the child. Marasmus typically presents as swollen body, edematous limbs, moon face and discoloured, hypopigmented hair. Kwashiorkor has become rather rare now-a-days.

**241. How will you manage a child with PEM?**

A. The best treatment for a child with PEM is to increase his food intake by whatever means. No specific dietary regimen is necessary as long as sufficient amount of hygienic ordinary food is given. For this purpose, two important points are feeding frequency and energy density. Feeding frequency of a malnourished child has to be increased so that something is given to him for eating every 3-4 hours. Increase in energy density can be achieved by giving more fat to the child. It

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is important to remember that no special efforts are needed to increase protein intake. Global dietary surveys have shown that diets all over the world contain sufficient protein to take care of body needs as long as sufficient food is eaten to fulfil the energy needs.

**242. What are nutritional deficiency diseases? Name some common nutritional deficiency diseases in India and how they can be controlled?**

A. The four common nutritional deficiencies of public health importance are protein-energy deficiency, iron deficiency, iodine deficiency and vitamin A deficiency. Control of PEM basically lies in ensuring adequate food intake by the child, for which nutrition education and increasing food purchasing power [decreasing poverty] are key approaches. Control of iron deficiency lies in nutrition education aimed at increasing intake of iron rich foods, especially leafy vegetables, and giving iron supplements. Control of iodine deficiency essentially lies in ensuring universal intake of iodized salt. Control of vitamin A deficiency essentially lies in nutrition education aimed at increasing the intake of green leafy vegetables and other vitamin a rich foods. The government is phasing out vitamin A distribution program for preschool children.

**243. What are fat soluble vitamins? Name diseases which result from deficiencies of fat soluble vitamins. How can you control such diseases?**

A. Main fat soluble vitamins are Vitamins A,D,E and K. Out of these only vitamin A deficiency is of

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public health importance. It leads to xerophthalmia, the earliest symptom of which is night blindness, while severe degrees cause keratomalacia, which may, ultimately, result in loss of the eye. Dietary sources are green leafy vegetables, yellow fruits, milk, eggs and liver. Vitamin D deficiency as such is rare because even in absence of dietary intake, it can be manufactured in body in presence of sunlight. Dietary sources are milk, eggs and liver. Natural vitamin E deficiency rarely occurs. This vitamin is present in sufficient quantity in the diet. Vegetable oils are a good source. Vitamin K deficiency never occurs because of deficient diet. This vitamin has a role in blood coagulation.

### **244. What is nutritional supplementation? Give some examples**

A. Nutritional supplementation means supplementing the nutritional intake of a person. This can be done by means of diet supplementation or specific nutrient supplementation. General diet supplementation is done to prevent or manage PEM in children. The Integrated Child Development Services [ICDS] is the biggest dietary supplementation program in the country at present. The biggest example of specific nutrient supplementation is iodization of salt, which is being done all over the country at present for prevention of iodine deficiency disorders. Other nutrient supplementation programs are those against iron deficiency [where iron-folic acid tablets are given to pregnant women and

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syrup to children] and vitamin A deficiency for which vitamin A solution is given to preschool children every 6 months.

### **245. What is Vitamin A prophylaxis programme?**

A. It was started in 1970 for prevention of vitamin A deficiency in children. Under this program, 200,000 international units of vitamin A are given every 6 months to children below 3 years of age in the form of one teaspoonful of oily solution. Recent evaluation of the program has suggested that it might be better to put more emphasis upon nutrition education aimed at increasing dietary intake of vitamin A rather than on six monthly vitamin A distribution.

### **246. What are limiting amino acids?**

A. Limiting amino acid is that essential amino acid which is in the minimum relative concentration in a foodstuff as compared to reference protein. When an amino acid is too less in a foodstuff,

biological value of that foodstuff would be decreased. If that deficient amino acid were to be supplemented to that foodstuff, its biological value would be increased. For example, lysine is the limiting amino acid in wheat. Similarly, methionine is the limiting amino acid in pulses. The concept of limiting amino acid is only a theoretical concept. Conceptually, it shows the biological value of the protein in a particular foodstuff if an animal were to be experimentally put on a diet in which the protein comes only from that particular foodstuff and no other food. Such situation never arises in natural life. In real

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life, we take always a mixture of proteins in our food, which consists of many foodstuffs. Thus, excesses and deficiencies of various amino acids in different foodstuffs tend to even out. For example, while wheat is low in lysine, pulses are rich in it; while pulses are low in methionine, wheat is rich in it. A cereal pulse combination, which is the norm in India and many other societies, ensures that there is a balanced amino acid pattern in over all protein intake.

### **247. What are essential fatty acids? Which foods are rich in essential fatty acids?**

A. Essential fatty acids are those fatty acids which cannot be manufactured in the body and must be supplied in diet. There are three essential fatty acids, namely, linoleic acid, linolenic acid and arachidonic acid. Of these, the last two can be converted in the body from linoleic acid. Hence, linoleic acid is the most important EFA. The EFAs are present in adequate quantity in most diets and, therefore, natural deficiency of EFA is unknown. The invisible fat present in cereals and pulses contains sufficient EFA for body needs.

### **248. What is the recommended daily dietary intake of iron during pregnancy?**

A. According to the ICMR, RDA for iron is 28mg. for men, 30 mg. for non-pregnant women and 38 mg. for pregnant women. It is more in pregnancy because iron stores needed for a healthy baby are derived from the mother's iron intake.

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### **249. Which foods are rich sources of iodine?**

A. Common sources of iodine in diet are milk, meat and cereals. Some green leaves, especially spinach, are also good sources. Sea fish and other sea foods are very rich in iodine.

### **250. What happens in deficiency of Riboflavin?**

A. Riboflavin is concerned with biological oxidative processes and its deficiency causes metabolic

impairment. Deficiency symptoms may be oral [angular stomatitis and glossitis], dermal [scaly desquamation of naso-labial folds and scrotal dermatitis] and ocular [vascularisation of cornea].

**251. What are the adverse effects of folic acid deficiency?**

A. Folic acid helps in the formation of white blood cells and in the maturation of normoblasts into red blood cells. Its deficiency causes megaloblastic anemia and may also lead to tropical sprue.

**252. How does cow milk differ from human milk?**

A. The major differences are as follows:

a. Human milk has only one third of the protein concentration compared to cow milk. But whey protein, which is soluble, is present in relatively much higher concentration in cow's milk, which is far richer in the insoluble casein. Because of this difference, the curd that forms in the stomach is much lighter and easily digestible in case of human milk than cow milk.

b. Human milk has slightly more fat than cow milk. Also, human milk contains a lipase

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enzyme because of which human milk fat is digested easily.

c. Human milk has almost double the amount of lactose compared to cow milk. Lactose provides an easily digestible source of energy. High lactose content helps in myelination in the growing nerve tissue of the baby. Also, part of lactose is converted to lactic acid in the intestine, which prevents growth of undesirable bacteria in the intestine.

d. Human milk contains the bifidus factor, which is a nitrogen-containing carbohydrate. Bifidus factor is necessary for the growth of *Lactobacillus bifidus*, which converts lactose to lactic acid.

e. Human milk, especially the colostrum, contains large amounts of Immunoglobulin A, which is not absorbed but acts in the intestine against certain bacteria [such as *E. coli*] and viruses.

f. Lysozyme, an enzyme, is present in human milk in concentrations several thousand times that of cow milk. Lysozyme breaks down certain harmful bacteria and also protects against various viruses.

**253. What is pasteurization?**

A. Pasteurisation is a process by which milk is made free from all pathogens, including the tubercle bacillus, which is killed at 63 degrees Celsius. In pasteurisation, milk is heated to a temperature

above 63 degrees. This process kills pathogens but preserves most nutrients which, on the other

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hand, are partially lost by boiling. In the British or holder process of pasteurisation, milk is heated and maintained at 65.5 degrees for half hour, then cooled to 10 degrees. In American or flash process, milk is heated and maintained at 71-72 degrees for 15 seconds, then suddenly cooled to 10 degrees.

### **254. What nutrients are found in green leafy vegetables?**

A. Green leafy vegetables contain the following nutrients in significant amounts:

- a. Vitamin A
- b. Riboflavin
- c. Folic acid
- d. Vitamin C
- e. Vitamin K
- f. Iron
- g. Calcium

### **255. Which oils are rich in polyunsaturated fatty acids?**

A. Vegetable fats are in general polyunsaturated while animal fats are, in general, saturated. An exception is fish oils, which are polyunsaturated. Amongst vegetable oils, those with maximum polyunsaturated fatty acid content are corn oil, cotton seed oil, sunflower oil and sesame oil. Groundnut oil is relatively saturated. Coconut oil is almost saturated.

### **256. How can nutrient losses be minimized during cooking?**

A. Following precautions should be taken so that nutrient loss during cooking is minimized:

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- a. Food should not be cooked for unnecessarily long periods.
- b. Cooking time can be reduced by the use of pressure cooker.
- c. Food should not be cooked in open pans. Nutrient loss is less if the pan is covered by a lid.
- d. Vegetables should not be cut into too small pieces.
- e. Vegetables should be washed before, not after, cutting.
- f. Baking soda should not be used because loss of vitamins is more in alkaline medium. Addition of a little lemon juice, tamarind, vinegar or sour curd or buttermilk makes the food slightly acidic and reduces vitamin loss.
- g. Water should not be thrown away after boiling rice or vegetables.



h. When cooking vegetables, they should be put straight into boiling water. By doing so, the enzyme oxidase is destroyed. Otherwise, this enzyme destroys vitamin C.

**257. What are the features of an Indian Reference Man as defined by ICMR?**

A. The reference man is aged 20-39 years and weighs 60 kg. Such a man has surface area 1.62 square metres and his BMR is 35.5 kcal. per hour per metre square. The reference woman is 20-39 years old, and weighs 50 kg. She has surface area 1.40 sq. m. and her BMR is 31.6.

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**258. What are the daily energy requirements of a sedentary male worker?**

A. The ICMR recommends that a sedentary male worker should take 2425 kcal. per day. The RDA for energy for a moderate and heavy male worker is 2875 and 3800 kcal respectively.

**259. What are the daily energy requirements of an adult female moderate worker?**

A. The RDA for energy for females is 1875 kcal. for sedentary worker, 2225 for moderate and 2925 for heavy worker.

**260. What are the energy requirements of an infant aged 5 months?**

A. ICMR recommends that a child aged 0-6 months should take 108 kcal. per kg body weight per day.

**261. What are the advantages of breast feeding?**

A. The major advantage is that breast milk is tailor made for the human infant as compared to cow milk which is meant for the calf. The human milk is more easily digestible. It is clean and there is no risk of contamination diarrhea. It is obviously economic, while other milks are expensive and need other things like feeding bottle and the facilities to keep them clean. Breast milk also contains anti-infective properties and prevents the child against infections. Children who are breastfed have more mother-child bonding and better psychological development.

**262. What is weaning and when should it be started?**

A. The term weaning is used in two ways. Correctly speaking, weaning means the period from when

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a mother decides to stop breastfeeding till she has achieved this. Sometimes, weaning is used to indicate the period from when supplementary food has been introduced till breastfeeding has ceased. As regards introduction of supplementary foods, solids may be introduced around 4-5 months of age. Too early supplementary feeding carries the risk of diarrhea. Too late

introduction carries the risk of malnutrition..

**263. How is malnutrition graded by Indian Academy of Pediatrics?**

A. According to Indian Academy of Pediatrics, children having weight upto 80% of the reference weight for age [50<sup>th</sup> percentile of the Harvard standards] are considered as normal. Those weighing between 71 and 80% are classified as first degree malnutrition; those weighing between 61 and 70% are classified as second degree malnutrition, while those weighing between 51 and 60% are classified as third degree malnutrition. Those weighing less than 50% are labelled as fourth degree malnutrition.

**264. What methods can be used to collect information on food consumption by a family?**

A. The most common and practical method is the diet history method in which the person is asked about the actual type and quantity of food eaten during past 24 hours. Further calculations about intake of different nutrients can be done with the help of food tables. Another method is to ask the person to keep a diet intake record in a diary for

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a few days. This record is then computed to find the average daily intake over the period. There are other methods also where the family is asked to actually weigh the foodstuffs cooked or consumed. But these are not practical at all and are rarely used.

**265. What is the applied nutrition programme?**

A. The applied nutrition program was started in 1960 in Orissa and was gradually extended to all states in 1973. The objectives of the program were:

- a. To make people conscious of their nutritional needs;
- b. To increase production of nutritious foods and their consumption;
- c. To provide supplementary nutrition to vulnerable groups through locally produced foods.

There were many shortcomings in the actual implementation of the program. With the adoption of ICDS as a national program, the ANP has almost ceased to exist.

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**266. Name some immunization preventable diseases?**

A. Common diseases which can be prevented by immunization include:

- Tetanus
- Poliomyelitis
- Diphtheria
- Whooping Cough
- Tuberculosis
- Measles
- Typhoid
- Rubella
- Mumps
- Chicken pox
- Hepatitis B

**267. Which immunizations are given to children during first year of life?**

A. The following immunizations are given to children during their first year of life:

- Tetanus
- Poliomyelitis

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- Diphtheria
- Whooping Cough
- Tuberculosis
- Measles

**268. What is the schedule for immunization during pregnancy?**

A. Tetanus toxoid is given during pregnancy. Two doses are to be given for primary immunization.

The first dose should be given between 16-20 weeks and the second dose between 20-24 weeks with a month's gap between the two doses. Since it takes 3 weeks for antibodies to develop, the second dose should definitely be given at least 4 weeks before delivery. If a woman has been adequately immunized earlier she needs only a booster dose of TT, given at least 4 weeks prior to delivery.

**269. What is the National Immunization Schedule?**

A. The National Immunization Schedule consists of 2 doses of TT during pregnancy, 3 doses of OPV and DPT between 6 weeks to 9 months with a gap of 4-6 weeks between each dose, one dose of BCG at birth or as early in life as possible, one dose of measles vaccine between 9-12 months and a booster dose of OPV and DPT at 16-24 months.

In addition, booster doses of DT at 5 years and TT at 10 years and 16 years are also recommended. For hospital deliveries an additional dose of OPV can be given at birth.

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**270. Define IMR.**

A. It is defined as the number of infant deaths (0-12

months) per 1000 live births in a country. It is a sensitive indicator of the level of health services in a country.

**271. What are the common causes of IMR in India?**

A. The common causes of IMR include:

- Immunization preventable diseases
- Low birth weight
- Acute respiratory infections
- Diarrheal dehydration
- Early weaning and lack of breastfeeding
- Congenital anomalies
- Birth injury
- Prematurity

**272. How is < 5 Mortality Rate defined?**

A. The total number of deaths among children less than 60 months of age per 1000 live births is defined as Under Five Mortality Rate

**273. What is Neonatal Mortality Rate?**

A. This is defined as the number of deaths less than 28 days of age per 1000 live births. Most of these deaths occur due to prenatal or natal causes.

**274. What is Perinatal Mortality Rate?**

A. This is defined as deaths of fetus after 28 weeks of gestation till the first 7 days of post natal life per 1000 live births.

**275. What is Low birth weight?**

A. Low birth weight is defined as a baby weighing less than 2500 grams at birth. In India the Indian

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Academy of Pediatrics has suggested at infants born with weight less than 2000 grams should be considered as low birth weight because Indian babies are smaller. However, for all international comparisons weight less than 2500 grams is considered as low birth weight

**276. What are the causes of low birth weight in India?**

A. The causes of LBW are maternal in origin.

However, in a third the cause is unknown. The common causes are:

- a. Maternal malnutrition
- b. Anemia
- c. TB
- d. Infections during pregnancy – Malaria, Urinary tract infection, etc.
- e. Systemic maternal diseases – Hypertension, etc.
- f. Multiple pregnancies

**277. What do you mean by high risk approach?**

A. High risk approach is applicable both to pregnant mothers and children. The basic premise of the approach is the use of screening tools to identify individuals who are at more risk of suffering from severe morbidity or mortality and provide extra care and support to such individuals. In antenatal care, mothers with anemia, malnutrition,

illness elderly primi, and those with history of earlier bad obstetric outcome, are high risk mothers.

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#### **278. What are the causes of maternal mortality?**

A. The causes of maternal mortality can be categorized as follows:

a. Obstetric causes: These account for more than 50% of deaths

- Puerperal sepsis
- PET
- Hemorrhage
- Rupture of uterus
- Accidents during labor

b. Non-obstetric causes

- Anemia
- Heart Disease
- Kidney disease
- Malignancies
- Hypertension
- Diabetes
- Jaundice
- TB
- Accidents ,etc.

c. Social causes

- Early marriage
- Early childbirth
- Large no. of pregnancies
- Frequent pregnancies
- Malnutrition
- Poverty
- Illiteracy, etc.

#### **279. What is a high risk pregnancy?**

A. A high risk pregnancy is one where the mother suffers from causes which are detrimental to her

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health or the fetal health. Some of these important factors are:

- PET
- Systemic diseases – Hypertension, RHD, Diabetes, Renal disease, etc.
- TB
- Age over 35 years
- Elderly primi
- More than 5 previous pregnancies
- History of past stillbirths
- History of neonatal deaths
- Previous Caesarian section
- Hemorrhage
- Placenta previa
- Short stature – below 150 cms
- Young primi - < 16 years, etc.

#### **280. How many visits should be made by a health**

### **worker during pregnancy?**

A. Ideally a mother should be seen once every month during the first 7 months and once every fortnight during the next two months and once a week after 36 weeks till delivery. However, this may not be possible in rural areas. Therefore, under the antenatal care program, each registered antenatal case should receive at least five antenatal visits of which one should be early in pregnancy, one should be after 36 weeks and at least one should be a home visit. The medical officer should examine the mother at least once during pregnancy. Complicated and high risk cases need more frequent visits.

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#### **281. What all drugs should a pregnant mother receive and for what duration?**

A. The mother should receive iron tablets once a day for three months during the second/third trimester. No medications should be given during the first trimester. 100 tablets of iron + folic acid are given to all mothers during pregnancy.

#### **282. What is the package of services provided under ICDS?**

A. The package of services under ICDS are as follows:

Beneficiary Services

Expectant and nursing – Health check-up mothers

- Tetanus Immunization
- Supplementary nutrition
- Nutrition and health education

Other women aged – Nutrition and health 15-44 years education

Children < one year – Supplementary nutrition

- Immunization
- Health check-ups
- Referral services

Children aged 12 – 36 months – Supplementary nutrition

- Immunization
- Health check-up
- Referral services

Children aged 3- 5 years – Supplementary nutrition

- Immunization
- Health check
- Referral services
- Non-formal pre-school education

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#### **283. What is the mid-day meal programme?**

A. The mid-day meal program was initiated in 1962 with the following objectives:

- To raise the nutritional status of primary school children, particularly those belonging to low socioeconomic status
- Improve attendance and enrollment in schools
- Prevent drop out from primary school



Ready to eat food is provided to children attending primary school (aged 6 – 11 years). Such food should provide 300 Kcal and 8-12 grams of protein per day for at least 200 days in a year.

**284. What is the cold chain and how is it maintained at the periphery?**

A. Vaccines are thermo-labile products and therefore need to be maintained at appropriate temperatures from production to distribution. The entire procedure of maintaining the appropriate temperatures from manufacturer to immunization is called the cold chain. Temperatures should be maintained between 2-8 degrees celsius. At the PHC level, this temperature is maintained by refrigerators while at the subcenter level or point of immunization this is maintained by vaccine boxes which are lined by ice packs. The recommended temperatures should be maintained during transportation also.

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**285. What is the Reproductive and Child Health Programme?**

A. This program has been initiated to meet the comprehensive health needs of the mother and child. The activities carried out include:

- Infant care including immunization
- Child care including immunization, vitamin A prophylaxis, nutritional anemia prophylaxis, acute respiratory infections control and diarrhea control.
- Antenatal care including immunization against tetanus, anemia prophylaxis, ante natal checkups, care at birth and birth spacing.

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# 10

## Environment

**286. What is environmental pollution?**

A. This may be described as the unfavorable alteration of our surroundings and occurs primarily due to actions of humans.

**287. What diseases can be caused by environmental pollution?**

A. Many diseases can be caused by environmental pollution. These can be categorized as follows:

Air pollution

- Bronchial asthma
- Pulmonary edema

- Bronchitis
  - Emphysema
  - Lung cancer
- Water Pollution
- Diarrhea
  - Cholera
  - Typhoid
  - Shigella
  - Amoebiasis

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Noise pollution

- Deafness
- Irritability

#### **288. What is a sanitary well?**

A. A sanitary well has the following characteristics:

- A pucca brick / concrete casing
- A parapet wall 0.5 – 1.0 m high with cement lining on both sides and sloping outwards on the top
- A pucca cement concrete platform on all sides of well of 0.5 – 1.0 meters in dimension and slopping towards the periphery.
- A circular drain around the platform to receive and dispose spilled water
- A drain (15-30 meters long) ending in a soak pit, garden or a field
- A common bucket should be used for drawing the water
- Well should be properly covered on the top to prevent contamination from outside
- There should be no trees nearby
- Distance from privy, drain or manure heap should not be less than 50 ft (15 meters)
- It should not be low so as to get flooded

#### **289. What are the biological water quality standards set out by WHO?**

A. The WHO has set out the following criteria for water quality:

- No sample should have E.coli in 100 ml.
- No sample should have more than 3 coliforms per 100 ml.

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- Not more than 5% samples throughout the year should have coliforms in 100 ml.
- No two consecutive samples should have coliform organisms in 100 ml.

#### **290. What are chemical water quality standards?**

A. The WHO has set out three chemical quality standards:

a. Toxic substances

- The upper permissible levels of lead, selenium, arsenic, cadmium, cyanide and mercury are 0.05, 0.01, 0.05, 0.005, 0.05 and

0.001 mg / litre in domestic drinking water

b. Substances that may affect health

– Fluorine should be present in a concentration of 0.5 – 0.8 mg/l

– Nitrates should not exceed 45 mg/l

– Polynuclear aromatic hydrocarbons should not exceed 0.2 micrograms per litre

c. Substances that may affect water acceptability

– Upper permissible limits have been set out for a number of substances like iron, lead, calcium, chloride, sulphate, etc.

– Total hardness should not exceed 2 meq/ liter

**291. What is the presumptive coliform test?**

A. This test is done on lactose bile salt medium which is a selective medium for coliform bacteria and is used to find the probable number of coliform bacilli per 100 ml of water.

**292. What are the methods for purification of water?**

A. There are different methods for purification on a large scale and on a small (domestic) scale.

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Large scale

– Storage

– Filtration

– Chlorination

Small scale (Domestic)

– Boiling

– Distillation

– Addition of bleaching powder

– Addition of chlorine tablets, iodine, potassium permanganate or alum

– Household filtration like pot method or ceramic filters, etc.

**293. What is a slow sand filter?**

A. This is used for purification of water on a large scale and includes the following:

– Water head of 1.0 – 1.5 meters depth

– Sand bed (1.25 meters thick) composed of sand particles of 0.15 – 0.35 mm in diameter supported on a layer of fine and coarse gravel

– Drainage system for the filtered water

– Filter control valves in the outflow pipe which helps to regulate the outflow of water.

**294. What is a rapid sand filter?**

A. This is commonly used now. Before the water comes to the filter it is subjected to a process of coagulation with alum. The filter bed is essentially similar to slow sand filter with two differences:

– The sand is coarser

– The biological membrane in slow filter is replaced by a layer of alum floc

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The rate of filtration in a rapid filter is 4000- 7500 liters per square meter as against 100 – 400 liters in a slow sand filter

**295. What is break point chlorination?**

A. This is the usual method of chlorination for large water supplies. It is that point in time when as chlorine is added to water, its chlorine demand is met and free chlorine starts appearing in water. The principle of break point chlorination is to add sufficient chlorine so that 0.5 ppm of free chlorine is present in the water after 30 minutes of contact time.

**296. What is super chlorination?**

A. This is the method of choice for highly polluted waters. In his method a high dose of chlorine is added. After 20 minutes of contact, dechlorination is done with sodium sulphate or sodium thiosulphate to reduce the taste of excess chlorine.

**297. How is amount of bleaching powder to be added to a well for disinfection calculated?**

A. The following steps are followed in calculating the amount of bleaching powder required to disinfect a well:

- a. Quantity of water in well should first be calculated by multiplying the surface area of water with the depth of the water column. The formula used is  $3.146 \times \text{radius in meters} \times \text{depth of water in meters}$
- b. Add bleaching powder at rate of 2.5 grams per 1000 liters of water. This will give about 0.7 mg of applied chlorine per litre

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- c. If one is not sure of quality of water in well, Horrock's test can first be performed to determine amount of bleaching powder to be added.
- d. The required quantity of bleaching water is put in an enameled bucket. Not more than 100 grams should be added at a time in the bucket.
- e. The powder is then made into a thin paste by adding a little quantity of water.
- f. More water is added to make the bucket  $\frac{3}{4}$  full.
- g. The mixture is stirred well
- h. The mixture is kept for 10 minutes to allow the lime to settle down in the bucket
- i. The supernatant fluid is transferred to another bucket.
- j. The second bucket containing the supernatant fluid is then lowered into the well such that the bucket is completely immersed in water.
- k. The bucket is then jerked up and down and sideways vigorously so that the supernatant fluid mixes well with the well water.
- l. At least 30 minutes time should be allowed before water from the well is used.

m. It should be ensured that after one hour of contact, there is 0.5 mg per litre of free chlorine in the well water.

n. It is always preferable to add the chlorine late in the day so that people can comfortably withdraw water the next day.

**298. What is the National Water Supply and Sanitation Programme and when was the programme started?**

A. This program was started in 1954, and was further supplemented in 1972. During the fifth five year

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plan, this program was included under the Minimum Needs Program. In 1981, the International Drinking Water and Sanitation Decade was launched by Govt. of India. All the problem villages without a safe drinking water supply are to be provided at least one safe source under the program. Problem villages are those where:

– No source of safe water is available within 1.6 km radius

– Water level is below 15 meters of depth

– Sources where excess levels of iron, fluoride, saline or other toxic elements are present in the water.

– Water source is exposed to risk of cholera or guinea worm.

**299. What is controlled tipping?**

A. This is a method of safe disposal of refuse where the refuse is placed in a designated area and covered with a layer of earth.

**300. What is the principle of functioning of an oxidation pond?**

A. This is also called the stabilization pond. Nature is allowed to purify sewage. The pond has the following characteristics:

– Presence of bacteria feeding on organic matter

– Presence of algae

– Presence of abundant sunlight.

The main action of the bacteria is aerobic. They degrade the organic matter to carbon dioxide, ammonia and water. Algae use these products for photosynthesis, whereby oxygen is

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produced. This oxygen is used by bacteria for aerobic decomposition. Anaerobic decomposition takes place in the lower layers especially at night. Thus, the pond purifies sewage both by aerobic as well as anaerobic decomposition.

**301. What are the harmful effects of ionizing radiation?**

A. These are:

– Cancers

- Genetic malformations
- Shortening of lifespan
- Skin lesions
- Cataract

**302. What are insecticides?**

A. These are substances that kill insects.

**303. What are contact poisons?**

A. These are substances that kill insects when they come in contact with the substances. These insecticides are absorbed by the cuticle of the insect and cause paralysis of the nervous system.

**304. Name some common organophosphorus insecticides?**

A. Some of the common organophosphorus compounds used as insecticides are:

- Diazinon
- Malathion
- Dichlorovos
- Parathion
- Chlorothion
- Fenthion

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**305. How will you treat a person suffering from organophosphate poisoning?**

A. The following steps are followed in treatment:

- Complete rest to affected individual
- Atropine ( 2 mg IV slowly) and repeated every 10-12 minutes till pupils are dilated
- Oximes (pralidoxime) 1 gram in 5 ml distilled water IV. If this is not available, blood transfusion may need to be considered.
- Frusemide 40-80 mg. IV
- Care of respiration
- General supportive measures

**306. What are stomach poisons?**

A. These kill insects on ingestion as they are absorbed from the mid gut. Sodium fluoride and formalin are common stomach poisons. They are a form of contact poisons.

**307. What is a disinfectant?**

A. Disinfectants are substances that destroy harmful microbes. They act by application and are usually ineffective against spores. They can be physical (sunlight, UV light, air, moist heat, ionizing radiation, etc.) or chemical (phenol, cresol, chlorhexidine, chloroxylenol, alcohol, formalin, bleaching powder, potassium permanganate, etc.)

**308. What do you understand by the term carbolic coefficient?**

A. Bactericidal activity of a disinfectant is compared to the efficacy of phenol and this is expressed as carbolic coefficient.



# 11

## International Health

### **309. What is the international vaccination certificate?**

A. This is essential for international travel. The WHO has modified the international vaccination requirements recently wherein only vaccination against yellow fever is mandatory for anybody traveling from a yellow fever-endemic-zone to non-endemic, zones. Diseases like cholera etc. do not need any certificate now.

### **310. What is Quarantine? If you are not vaccinated and are coming back to India from West Africa what will the Airport Health authorities do?**

A. Quarantine is the restriction of activities of well persons or animals who have been exposed to a communicable disease or are traveling from a disease-endemic-zone to a non-diseased-area for a period of time equivalent to the longest known incubation period of that specific communicable disease. This is done to prevent contact with individuals who are not exposed to a communicable disease and to prevent transmission to an area free of disease.

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### **311. What is modified quarantine?**

A. This refers to selective partial limitation of movement of contacts of communicable diseases to protect susceptible individuals from contracting disease. Exclusion of children with chickenpox and measles from regular school is an example.

### **312. When is World Health Day celebrated?**

A. The World Health Day is celebrated on the 7th April every year to celebrate the birth of WHO.

### **313. When is World AIDS Day celebrated?**

A. World AIDS Day is celebrated on 1st December every year.

### **314. What is the WHO and when was it founded?**

A. WHO is the World Health Organization which is an organ of the United Nations to cater to health needs of member countries. WHO is specifically concerned with health services development, biomedical research, prevention and control of specific diseases, international health statistics, international health regulations, cooperation with other agencies, family health, environmental health and health literature and information. It was founded on the 7th of April 1945.

**315. What is UNICEF? What activities does UNICEF undertake in India?**

A. This is the United Nations International Children's Emergency Fund and was established by UN in 1946 to provide relief to war-ravaged children. The four major areas of functioning in

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India are child health, child nutrition, family and child welfare and education. It helps in immunization, nutrition, disease control, identification of problems and strategic interventions, HIV control and support to children in emergencies like war, famine, drought, earthquake, etc.

**316. In what way does the World Bank assist in health programmes in India?**

A. The World Bank has been providing assistance and soft-term loans for a number of health programmes in India. Population control, water supply, sanitation, blindness control, HIV/AIDS control are some of the important projects supported by the Bank.

**317. What is CARE?**

A. Cooperative for American Relief Everywhere is a voluntary organization set up in 1946 to help relieve war suffering. It now operates in a large number of developing countries. The mid-day school meal program and HIV/ADS control are some of the activities supported by CARE.

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# 12

## Health Information Systems

**318. What are vital statistics?**

A. Vital statistics are defined as the collection, compilation, analysis and interpretation of data on vital events like births, deaths, marriages and divorces that occur in a community or country.

They help in providing answers to:

- Leading causes of morbidity and mortality
- Trends in vital events over time
- Age, gender, residential, occupational, socioeconomic status and geographic distribution
- Composition of population and future predictions
- Prioritization of health needs of communities.

**319. What is the census? When was the last census done in India?**

A. Census refers to the enumeration of the total population of a country wherein people are counted at a given moment of time. It is defined as the total process of collecting, compiling and publishing demographic, economic and social data pertaining to all persons in a country or delimited territory at a specified point of time. Earlier, in India the de facto basis was adopted wherein people were counted where they were found while now the de jure procedure is followed wherein people are counted at the normal place of residence even if the concerned person is not present at that place at that point in time. The last census was conducted in March 2001 as the census is carried out at the end of the first quarter in the first year of the decade.

**320. What is Sample Registration System?**

A. This was initiated in 1964 and now covers the entire country. It is based upon a dual recording system comprising of continuous registration of vital events supplemented by a half yearly retrospective survey, each providing a check on the other. The main objective is to provide reliable estimates of vital rates at the state and national level.

**321. What is the Registration of Births and Deaths Act?**

A. This Act was passed in 1969 and thereafter, compulsory registration of all births and deaths occurring in the country are recorded with the Registrar of Births and Deaths. Birth has to be registered within 7 days and deaths within 3 days. Defaulters are punishable by law.

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# 13

## Concepts in PSM

**322. What do you understand by phases of prevention?**

A. There are three phases of prevention as enunciated by Leavell and Clark. These are called primary, secondary and tertiary prevention. Primary prevention refers to action taken before occurrence of disease while secondary prevention refers to disease control or harm reduction after disease has occurred. Tertiary prevention

refers to activities directed towards rehabilitation of individuals with irreversible damage.

Recently people have started talking about primordial prevention which refers to the process whereby the disease agent is not allowed to come in contact with the human host.

**323. What do you understand by levels of prevention?**

A. There are five levels of prevention. These are:

- Health promotion
- Specific protection

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- Early diagnosis and treatment
- Disability limitation
- Rehabilitation

Health promotion and specific protection come into the realm of primary prevention while early diagnosis and treatment falls within secondary prevention and disability limitation and rehabilitation are levels within the phase of tertiary prevention.

**324. What do you understand by the term natural history of disease?**

A. This refers to the natural progression of the disease process in the absence of any intervention to arrest the disease.

**325. What is multifactorial causation of disease?**

A. It is now known that disease does not follow a linear pattern wherein a person exposed to a disease causing organism definitely develops disease. Multiple factors are responsible for somebody to develop a disease and others to escape the clutches of the disease. Mycobacterium is an essential cause of TB but is not a sufficient cause as factors like overcrowding, virulence, pathogenicity, disposal of sputum and related behavior, nutrition, etc. are all important causes. This is also referred to as the web of causation.

**326. How does WHO define health?**

A. Health is defined as a state of complete physical, mental, social and spiritual health and not the mere absence of disease or infirmity.

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**327. What do you understand by tip of the iceberg?**

A. Since all diseases progress along a gradient starting from contact with a cause of disease to severe disability and death, one sees all stages of disease in a community. However, only the individuals with overt manifestations and those with severe disability will be routinely 'visible' and a large proportion of disease is not visible to the naked eye. What is visible is called the tip of the iceberg

as only a small proportion of disease can actually be overtly seen and the largest chunk is under the surface, just like in the case of an iceberg

**328. What do you understand by time, place and person distribution?**

A. Diseases can be described by characteristics based on when they occur, where they occur and who are the people who are affected. This is called the time, place and person distribution.

**329. Give some examples of how agent factors cause disease?**

A. An agent is described as an organism, substance or force, the presence or lack of which may initiate a disease process or may cause it to continue.

Mycobacterium tuberculosis, deficiency of iron, smoking, and radiation are agent factors causing TB, anemia, coronary artery disease and cancers respectively.

**330. Give some examples of how external environmental factors cause disease?**

A. The quality of the environment plays an important role in disease causation. Poor air quality causes

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disease like asthma and bronchitis, while poor environmental sanitation and unsafe water cause diseases like cholera, typhoid and diarrhea.

**331. What do you mean by lifestyle? In which diseases are lifestyle factors very important?**

A. Lifestyle is the sum total of habits, beliefs and practices. In contemporary society harmful lifestyle factors have emerged. These include smoking, overnutrition, lack of exercise and sedentary lifestyle. These are important causes of CAD and diabetes.

**332. What are determinants of health?**

A. These refer to the etiological or risk factors for a disease. In simple terms these refer to factors, which determine why disease afflicts some individuals and why some individuals remain disease-free. One of the prime functions of epidemiology is to search for determinants of disease.

**333. What is disease eradication? How does it differ from regional elimination and control?**

A. Eradication refers to the state where a disease no longer exists anywhere on the face of the earth. It therefore has a global connotation. Regional elimination refers to the complete elimination of a disease from a country or a group of countries. Control is a more benign term as it refers to a situation where a disease cannot be completely removed but is brought down to levels where it is in manageable proportions.

**334. What is incubation period?**

A. This is the time duration from the receipt of infection by a human host to the onset of clinical manifestations of the disease. During this period, the organisms multiply but are not adequate to produce symptoms.

**335. What is an intermediate host?**

A. The host in which the asexual development of an organism occurs is called the intermediate host.

**336. What is extrinsic incubation period?**

A. The length of time that a vector takes to become infective to humans from the time it received the organisms of disease is referred to as the extrinsic incubation period.

**337. What is Surveillance?**

A. This is the complete process of collection, compilation and analysis of data which enables program managers to institute remedial or corrective measures for detected deficiencies. It is a process where a strict vigil or watch is maintained on the situation in a community.

**338. What is the difference between Monitoring and Evaluation?**

A. Monitoring is the process which is undertaken to assess whether a program is progressing on the charted course while a program is being implemented (Concurrent); evaluation refers to assessment of gains and benefits of specific interventions after completion of an activity or intervention (Terminal).

*Industrial Health* 125

# 14

## Occupational Health

**339. What is Pneumoconiosis?**

A. These are a group of lung diseases caused by inhalation of insoluble dust particles. Particles of 5 – 10 microns in size are sucked into the respiratory tract while those measuring 3-5 microns are arrested in the mid respiratory passages. It is only particles of 0.5 – 3 microns that reach the smaller passages of the respiratory system that cause pneumoconiosis.

**340. What is the ESI Act?**

A. This refers to legislation for Employees Health and is called the Employees State Insurance Act. The Act was passed in 1948 and covers the whole country. The Act was further amended in 1975 to



increase the reach of services under the Act. Employees contribute 2.5% of their wage while the employer contributes 5% of the wage bill. Under the Act, the following benefits are extended to the workers:

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- Sickness benefit
- Maternity benefit
- Disablement benefit
- Dependent benefit
- Funeral benefit
- Medical benefit
- Rehabilitation benefit.

*Social Medicine* **127**

# 15

## Social Medicine

**341. What is an extended family?**

A. Family is the basic unit of society. An extended family is a linear extension of a nuclear family and consists of husband, wife and their married children living together.

**342. What are the characteristics of a joint family?**

A. This is a lateral extension of a nuclear family in which the families of siblings live together, wherein the males of the family are all related to each other by blood. The income, shelter and kitchen are usually common though some modifications have been occurring recently where a portion of the money is shared while another portion remains with the family of one sibling and the kitchen is divided.

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**343. What is the difference between a family and a household?**

A. In a family, all members are related either by blood or by marriage while this is not the case with a household where there is no blood or marital bonding but people stay under a common roof.

**344. How can you determine socio economic status in an urban area in India?**

A. A number of scales are available for determining socio-economic status in the rural areas. The Uday Pareek scale is one example. Such scales give due weightage to land holdings and land produce as estimation of income in agricultural communities is difficult.

*IEC* **129**

# 16

## IEC

### **345. What is IEC?**

A. IEC is the process of providing information to individuals in a community through the use of communication channels in such a manner that they are motivated to assimilate the message and are educated to act. Health education was the term used earlier.

### **346. What are the characteristics of effective health education?**

A. The characteristics of effective health education are:

- Promotes actions which are realistic and practical and feasible within the constraints faced by individuals and communities.
- Builds on ideas, concepts and practices that people already possess.
- Repeats and reinforces information over time, using different methods.

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- Uses existing channels of communication
- Attracts attention of communities
- Uses clear, simple and unambiguous language.
- Provides opportunities for dialogue and discussion
- Demonstrates benefits of adopting a particular practice.

### **347. What is role play?**

A. This is a brief acting out of an actual situation for the benefit of the audience to facilitate better understanding.

### **348. What is a symposium?**

A. This is a modification of the didactic lecture method in which several experts are allocated different aspects of a particular topic to cover a topic comprehensively. Each person tackles the topic from his own perspective and therefore avoids monotony.

### **349. What is mass media?**

A. Media which caters to a large proportion of people at the same time is referred to as the mass media. These could be print or non-print media. Newspapers, TV, Radio are examples of mass media.

### **350. What are flash cards?**

A. These are a set of 15-20 cards about 40 cm x 50 cm

in size on which a particular theme is explained by pictures or line drawings. The educator flashes them in front of the audience while speaking.

Educator notes are written on the reverse and the

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cards are held at chest height while being presented.

**351. What are folk media?**

A. These are the traditional forms of media which exist in the society and are culturally acceptable to the communities. Nautanki, Kathputli, Katha, etc. are examples of folk media.

**352. What is Child-To-Child programme?**

A. In this programme, children are provided educational inputs which they are expected to imbibe and pass on relevant messages to the younger siblings at home and therefore care for the younger siblings in a better fashion.

**353. What is Social Marketing?**

A. This is merely the application of commercial marketing principles to advance a social cause, issue, behavior, product or service. It has been used successfully in promotion of condoms and ORT in India.