COMMUNITY MEDICINE

COMMUNITY MEDICINE

Solved Question Papers

(With PG Entrance Points)

Sixth Edition

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Foreword
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Contents

MBBS PHASE III EXAMINATION

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(Revised Scheme 2 and 3)

PAPER I

LONG ESSAYS

1. Describe in detail, the various health problems due to industrialization.

- Industrialization implies the transformation of a peasant society into a community dependent upon the industries
- Industrialization causes a social and economic revolution in the culture of a nation and any such revolution is bound to cause some health problems.

Health Problems Due to Industrialization

a. Communicable diseases
   - Industrial areas show high prevalence of tuberculosis, venereal diseases and food and water-borne infections
   - Areas with industries without proper sewage disposal are also prone for mosquito-borne diseases like filariasis owing to breeding of mosquitoes in contaminated water
   - All these are in addition to certain specific diseases associated with specific industries like pneumoconiosis, occupational cancer, etc.

b. Foodborne diseases
   - Food sanitation standards are lowered due to industrialization leading to rise in incidence of typhoid fever and viral hepatitis
   - With industrialization, increasing demand of ready to eat food and use of modern techniques has leads to various diseases like mechanical refining of flour has resulted in decreased fiber intake, causing numerous diseases associated with this condition and refined sugar intake is well known risk factor for diabetes
   - To increase self-life food processing industry is relying heavily on chemical additives which are foreign to human body leading to allergic conditions.

c. Mental health
   - Industrialization has leads to migration of people villages to alien urban life which requires certain adjustments
   - Failure to adjust to altered living conditions leads to mental illness, psychoneurosis, behavior disorders, and delinquency, etc.

d. Noncommunicable diseases
   - With industrialization and rapid urbanization, there is increasing level of affluence (modernization) which has lead changes in the lifestyle leading to high prevalence of chronic noncommunicable diseases or lifestyle disorders
   - Machines have decreased the need for physical energy expenditure by man, leading to obesity which is risk factors for ischemic heart diseases, diabetes.

e. Accidents
   - Accidents are on rise in industrial towns due to congestion, vehicular traffic and increased momentum of life
   - Then there are accidents that occur in the factories due to worker's fatigue, mechanical problems, etc.

f. Diseases due to poor environmental sanitation
   i. Housing
      - Most of the migrant labors in industrial towns live in slums with poor standards of living, overcrowding, poor lightening and ventilation and insanitary conditions leading to high prevalence of communicable diseases in these slums often leading to epidemics.

ii. Water pollution
- Discharge of toxic industrial waste without treatment into water bodies which are main source of drinking water for the industrial towns has leads to numerous water-borne diseases besides skin infections in people using these water bodies for other purposes like bathing, etc.

iii. Air pollution
- Industries are notorious for polluting air with toxic fumes, gases, smoke and dust into atmosphere
- Moreover burning of more fuel for transport, cooking and electricity needed by more people means higher air pollution
- Thus, there is a rapid increase in incidence of respiratory disorders like chronic obstructive pulmonary disease (COPD), asthma in population especially children and elderly living in industrial towns.

iv. Noise pollution
- Noise pollution like other pollutants is also a by-product of industrialization leading to hearing loss, tinnitus, mental stress, etc.

v. Sewage disposal
- Rapid urbanization and uncontrolled growth of slums has caused enormous pressure on existing sewage disposal infrastructure
- Improper sewage disposal is major risk factor for spread of diseases due to water pollution, soil pollution, vector breeding, etc.

vi. Vector problem
- Collections of water, in and around industries and residential areas, become the potential breeding places for the mosquito vectors.

g. Diseases due to social problems
– Social problems like alcoholism, drug addiction, prostitution, etc. have lead to increased incidences of certain diseases.

h. Morbidity and mortality
– Industrial areas are characterized by high morbidity and mortality from certain diseases like chronic bronchitis and lung cancer
– Crude death rate and infant mortality rate has increased in industrial areas.

Prevention

a. Town planning/zoning
– Numerous health problems of industrialization can be prevented or resolved with proper town planning or zoning.

b. Sewage and effluent treatment
– Proper sewage disposal methods or strengthening of existing sewage treatment plants helps in reduction in vector breeding
– Dilution or treatment of industrial effluents can contain water pollution.

c. Improving public health infrastructure
– Establishment of urban health centers in slums help in rapid detection of communicable diseases and prevent their spread to before they become epidemics.

d. Food hygiene
– Improvement of food hygiene, consumption of fresh food and less reliance of processed food or ready to eat food will prevent many of the food-borne diseases or allergies.

e. Ergonomics
– Healthy working environment will improve mental health of the workers.

Significance

- In race to become developed nation, India has promoted industrialization; however, policy makers have blind sided with the concurrent development of public health
- Thus due to low level of public health, the average expectation of life in India is less than that in industrially advanced countries.

2. Classify and describe the various methods of health communication. Enlist the advantages and disadvantages of the different methods.

Refer Question No. 2 June 2009 (RS2) Paper I.

SHORT ESSAYS

3. Characteristics of a normal distribution curve.

Refer Question No. 6 December 2014 (RS2) Paper I.

4. Attributable risk and population attributable risk.

Refer Question No. 1 December 2016 (RS2) Paper I.

5. Prevention of indoor air pollution in India.

- Indoor air pollution is the degradation of indoor air quality by harmful chemicals and other materials.

Principal Sources

- Combustion, building material, and bioaerosols.

Prevention and Control

a. Health education and public awareness
   - Most important steps in prevention of indoor air pollution is health education, i.e. spreading awareness among people about the issue and the serious threat it poses to their health and wellbeing
   - It should help people in finding different ways of reducing exposures with better kitchen management and protection of children at home
   - People should be educated about the use of alternative cleaner sources of energy to replace direct combustion of biomass fuel
   - Besides public, other stakeholders like politicians and administrators also should be educated to ensure their commitment and increase their awareness about health effects of indoor air pollution.

b. Change in pattern of fuel use
   - Factors determining preferred fuel include individual habit, availability and affordability of the fuel
   - Majority of low income families rely solely on direct combustion of biomass fuels for their cooking needs as this is the cheapest and easiest option available to them
   - This scenario can be improved by promoting use of cleaner energy sources such as Gobar Gas which utilizes cow dung to produce gas for cooking.

c. Modification of design of cooking stove
   - Traditional smoky and leaky cooking stoves should be modified to fuel efficient, smokeless stoves with an exit (e.g. chimney)
   - National Biomass Cookstoves Initiative, of the Ministry of New and Renewable Energy designed a new stove under a Special Project on Cookstove during 2009–2010, with the primary aim of enhancing the availability of clean and efficient energy for the energy deficient and poorer sections of the country.

d. Improvement in ventilation
   - Provision for adequate ventilation should be made during the construction of a house
   - For poorly ventilated houses, measures such as a window above the cooking stove and cross ventilation though doors should be instituted

e. Intersectoral coordination and global initiative
   - Indoor air pollution can only be controlled with coordinated and committed efforts between different sectors concerned with health, energy, environment, housing, and rural development.

Significance

- It is essential to prevent and control indoor pollution as due to contained areas, pollutants can build up more thus can be up to 10 times worse than outdoor air pollution
- Tackling indoor air pollution and providing universal access to clean household energy is a great opportunity to improve health, reduce poverty, and protect our environment; thus, contributing significantly to achieving the Millennium Development Goals.

Ref: Kankaria A, Nongkynrih B, Gupta SK. Indoor Air Pollution in India: Implications on Health and its Control. Indian Journal of Community Medicine 2014;39(4):203-20.

6. Sampling techniques.

Refer Question No. 1 June 2016 (RS2) Paper I.

7. Role of legislation in reducing alcoholism in the society.

- Legal control on the distribution of alcohol, when effectively applied has been and remains an important approach in the prevention of alcoholism.

Legislation Methods for Reducing Alcoholism

a. Partial restriction
   - Minimum age at which minors may legally have access to alcoholic beverages is raised in some countries, like in India, it is 21 years
   - Limited drinking hours at bars or drinking in public places discourages alcoholics.

b. Complete non-availability
   - Countries like Saudi Arabia have absolute ban on alcohol where it is completely not available.

c. Controlling manufacture
   - Almost all countries control alcohol manufacturers through licensing.

d. Promotion
   - Banning advertisements of alcohols on electronic media.

e. Distribution
   - There is also legislation controlling the distribution of alcohol in some countries
   - Retail distribution of alcohol also requires licence which is strictly controlled by the government
   - In India, it is illegal to sell alcohol within 500 meters of National Highways to prevent drunken driving.

f. Increase price
   - Many countries levy numerous taxes on the price of alcohol to increase its price thus deter the alcoholics.

g. Prohibit alcohol
   - Many Islamic countries have prohibited consumption of alcohols to its citizens
   - In India, state of Gujarat, Bihar, Nagaland, Manipur, Lakshwadeep and district of Wardha have alcohol prohibition.

h. Legislation
   - Almost all countries have drunken driving as a serious offence inviting jail term
   - Maximum legal BACs also show a wide variation ranging from 30–70 mg% in different countries
   - In India legal limit of alcohol is 30 mg/dL.

8. Methods of pasteurization of milk.

Refer Question No. 6 December 2009 (RS2) Paper I.

9. Modes of transmission of diseases.

Refer Question No. 1 June 2009 (RS2) Paper I.

10. Define rate, ratio and proportion using appropriate examples.

– Rate, ratio and proportion are basic tools in measurement of disease magnitude in a community
– They help to compare disease frequency with that of other countries or other groups of population in the same country

	Rate	*Ratio*	*Proportion*
Definition	▪ Rate is a measure of occurrence of a event (disease incidence or death) in a population during a given time period ▪ It is a statement of the risk of developing a condition and indicates the change in some event that takes place in a population over a period of time ▪ It is basically a proportion, but with an added relationship with time	▪ Ratio is a relation in size between two random quantities obtained by dividing one quantity by another	▪ Proportion is a ratio which indicates the relation in magnitude of a part of the whole
Expressed as	▪ Expressed per 1000 or some other round figure (10,000; 100,000) selected according to the convenience or convention to avoid fractions	▪ Expressed as x: y or x/y	Expressed as percentage
Components	▪ Numerator (usually a component of denominator) ▪ Denominator ▪ Time specification (usually a calendar year) ▪ Multiplier	▪ Numerator (not a component of denominator) ▪ Denominator Both may involve an interval of time or may be instantaneous in time	▪ Numerator (always a component of denominator) ▪ Denominator
Example (in a hypothyroidism study)	Rate of hypothyroidism in females = Total No. of female patients in a year/Total female study population × 1000	Ratio of female patients to male patients = No. of females/No. of males	Proportion of female patients = No. of female patients/Total no. of patients
Other examples	▪ Death rate, birth rate, Infant mortality rate	▪ Maternal mortality rate, ▪ Sex-ratio, doctor-population ratio, child-woman ratio, etc.	▪ Under 5 proportional mortality rate, proportional mortality rate
Significance	▪ Rate helps the epidemiologist compare frequency or rate of a particular event in a community with that of another community	▪ Ratio gives idea of another very important measure, i.e. the odds	▪ Proportion gives idea of a important measure in research methodology, i.e. the probability

11. Implications of false-positive and false-negative results in clinical practice.

- In relation to a screening test, epidemiologist thinks in terms of sensitivity and specificity whereas the clinician thinks in terms of false-negatives and false-positives

	False-negatives	*False-positives*
Definition	▪ Percentage of diseased people wrongly identified as not having the disease, because the test result is negative	▪ Percentage of healthy people wrongly identified as having the disease, because the test result is positive
Features	▪ False-negative result means that patients who actually have the disease are told that they do not have the disease, i.e. they are falsely given negative reports ▪ Amounts to giving them a false reassurance	▪ False-positive result means that patients who do not have the disease are told that they have the disease, i.e. they are falsely given positive reports ▪ Amounts to giving them a false anxiety

Implications in clinical practice	▪ Patient with a "false-negative" test result might ignore the development of signs and symptoms and may postpone the treatment ▪ This could be detrimental if the disease in question is a serious one and the screening test is unlikely to be repeated within a short period of time	▪ Normal healthy people may be subjected to further diagnostic tests, at some inconvenience, discomfort, anxiety and expenses ▪ False-positives not only burden the patients and diagnostic laboratories, but they also bring discredit to practicing physician
Related to	▪ Sensitivity (Lower the sensitivity, larger the number of false-negatives)	▪ Specificity (Higher the specificity, lower the number of false positives)

Significance

- False-positives and false-negatives help calculate predictive value of a screening test
- False-positives and false-negatives have to confirmed by the gold-standard test (test with high validity).

12. Different types of association.

- Association is the concurrence of two variables more often than would be expected by chance
- It does not necessarily imply a causal relationship.

Types

a. Spurious association
b. Indirect association
c. Direct (causal) association
   i. One-to-one causal association
   ii. Multifactorial causation.

Spurious Association

- Spurious association is an observed association between a disease and the suspected factor which is not fact
- Such association may result from
  - Chance
  - Ecological correlation
  - Selection bias, i.e. disparity between the study group and the control group.

Example

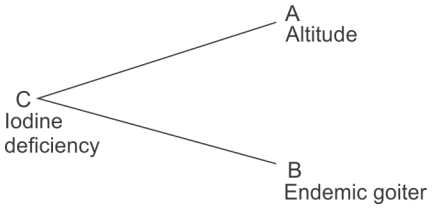
- In a study in UK, it was observed that the perinatal mortality was more in hospital deliveries than home deliveries thus wrongly interpreting that the domiciliary deliveries are safer
- This kind of spurious association resulted because home deliveries were compared with hospital deliveries which are usually high risk thus associated with high perinatal mortality.

Prevention

- In a epidemiological study, the study group and control group should be comparable, i.e. there should be no selection bias to avoid such spurious associations.

Indirect Association

- Indirect association is a statistical association between a characteristic (or variable) of interest and a disease due to presence of third factor (known or unknown) which is common to both the characteristic and the disease
- This third common factor is called as "confounding factor"
- Common confounding variables include age, sex, social class and they are potentially and probably present in all data
- They represent a formidable obstacle to overcome in trying to assess the causal nature of relationship.



Example

- Endemic goiter is associated with high altitude, however, there is no direct association between these two variables unless the common (compounding) factor of iodine deficiency is taken into consideration.

Significance

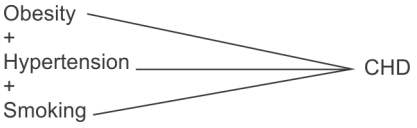
Indirect association is only a statistical association which does not necessarily mean causation.

Direct (Causal) Association

a. One-to-one causal relationship
   - This means if causative factor (A) is present, disease (B) must result and conversely when disease (B) is present, causative factor (A) must be present
   - It is significant in communicable diseases.
   - Usually single causative agent results in single disease
     - Example: Tubercle bacilli is the causative agent of tuberculosis
       Tubercle bacilli ↔Tuberculosis
   - However, in some instances single causative factor (A) can result in more than one disease (B, C, D)
     - Example: Hemolytic streptococci results in tonsillitis, scarlet fever and erysipelas.

   Significance
   - This concept of one-to-one causal relationship is the essence of Koch's postulates of germ theory
   - However, though ideal in disease etiology, it does not explain every situation.

b. Multifactorial causation
   - In noncommunicable diseases more than often, multiple factors are involved, which may act independently or synergistically
   - A complex interaction of various causal factors are involved in disease causation
   - In certain diseases like independent risk factors can produce disease independently
     - Example: In lung cancer independent risk factors like smoking, air pollution, etc., can produce the disease independently



   - In some diseases, there could be additive effects of risk factors too
     - Example: In coronary heart disease, effect of smoking, obesity, hypertension results in cumulative effect.

   Significance
   - In biological phenomena, the requirement that "cause" is both "necessary" and "sufficient" condition is not easily reached, because of the existence of multiple factors in disease etiology.

SHORT ANSWERS

13. Herd immunity.

Refer Question No. 10 June 2012 (RS2) Paper I.

14. Social security.

Refer Question No. 2 December 2009 (RS2) Paper I.

15. Epidemic.

Refer Question No. 4 December 2016 (RS2) Paper I.

16. Define silicosis. How is it diagnosed?

Refer Question No. 11 December 2013 (RS2) Paper I.

17. List four micronutrient deficiency disorders in India.

- Micronutrient deficiency disorders (malnutrition) refers to a group of conditions caused by deficiency of essential vitamins and minerals such as vitamin A, calcium, iodine, iron and zinc.

Examples

- Nutritional anemia (Iron deficiency anemia)
- Vitamin A deficiency (Xerophthalmia)
- Iodine deficiency
- Rickets.

18. Occupational hazards of healthcare professionals.

- No occupation is free from occupational hazards and healthcare is no exception.

Occupational Hazards of Health Care Professionals

a. Physical hazards (Radiations)
   i. Ionizing radiation: X-rays, electromagnetic fields, radioactive isotopes like Co60, P32
      - Acute effects
        - Acute radiation syndrome
      - Chronic effects
        - Somatic effects: Leukemia, aplastic anemia, cancer, tumor induction, pancytopenia
        - Genetic effects: Stillbirths, congenital defects, neonatal deaths, sex chromosome aneuploidy, sterility
   ii. Nonionizing radiation
      - Lasers
        - On the skin: Burns, erythema, dermatitis, cancer
        - On the eyes: Photophobia, conjunctivitis, keratitis, corneal ulcer, blindness
      - Ultraviolet radiation
        - On the skin: Darkening, thickening, erythema, cancer
        - On the eyes: Photophobia, conjunctivitis, keratitis, corneal ulcer, blindness

b. Chemical hazards (Anesthetic gases)
   – Ether, chloroform, trichloroethylene

c. Biological hazards
   – Tuberculosis, hepatitis B and C, HIV
   – Other communicable diseases like respiratory infections

d. Psychological hazards (due to sleep deprivation, excessive work, failure to develop a healthy relationship co-workers, employers, management, supervisors, etc.)
   i. Psychological (Behavioral) changes
      - Hostility, aggressiveness, anxiety, depression, frustration, tardiness, alcoholism, drug addiction, sickness absenteeism, etc.
   ii. Psychosomatic ill health
      - Neurosis, fatigue, propensity to peptic ulcer, hypertension, asthma, etc.

Prevention and Control

a. Health promotion
   – Healthy, sterile working environment
   – Maintenance of personal hygiene

– Education of the support staff and others involved in health care
– Limited working works to reduce stress and fatigue

b. Specific protection
– Consists of avoiding exposure to infectious agents, radiations
– Use of protective gears like gloves, masks, eye goggles, gowns, lead aprons
– Preexposure immunization against hepatitis B
– Postexposure treatments in HIV, hepatitis B and other diseases
– Following universal precautions

c. Early diagnosis and treatment
– Periodical examinations for the detection of communicable diseases, HIV, hepatitis B, HCV
– Regular check of radiation exposure and radiation leaves at regular intervals.

19. Recommend solution for the problem of drug abuse in India.

- Drug abuse is defined as the self-administration of a drug in quantities and frequencies which may impair the ability of an individual to function normally and results in social, physical and emotional harm.

Solution for Drug Abuse in India

a. At Individual Level
i. Deaddiction
- Identification of drug addicts
- Motivation for detoxication
- Hospitalization, provide fear therapy, psychotherapy, counseling
- Medical treatment or substitution
❖ Using methadone for opioid abusers
- Change of the environment (home, school, college, social circle)
- Postdetoxication counseling to prevent relapse (based on clinic and home visits)
❖ Drug addict is made aware of long-term hazards of the drug and he is informed about his responsibility to safeguard his health by quitting the habit
- Rehabilitation (vocational training and placement in appropriate job)
❖ Helps to prevent relapse.

b. Family Level
i. Parents should be educated about need to shower love and affection on their children and to be neither too strict nor too lenient with them
ii. They should be encourage to tell their children that they disapprove the drugs.

c. Community Level
i. Educational approach
- Public should be informed through campaigns on audio-visual media, leaflets, posters
- Educational programs should be arranged for school children and school authorities with the help of police should make the school and surroundings a drug-free zone

ii. Service approach
- Establish teen centers to attract the teenagers where they are made healthy and active by participating in sports, music, athletes, gymnasium, artistic activities, etc. and prevent them from drifting into drug taking
- Establish self-help groups consisting of ex-addicts to encourage those who want to give up the habit of taking drugs

iii. Legal approach
- Legislation should be directed at various levels like manufacturing, distribution, prescription, price, advertisements, consumption, etc.

Significance

- Drug abuse is a social problem which best resolved at individual level instead of legal approach since a deaddict is the best person to motivate another addict to go drug free.

20. Sample registration system in India.

- Sample registration system is a large scale demographic survey conducted in India for providing reliable annual estimates of birth rate and other fertility and mortality indicators at the national and sub-national level[Q].
- It was started in 1964–65 by Office of the Registrar—General, India on pilot basis and now covers entire nation.

Procedure

- Done once in 6 months[Q]
- A part time resident enumerator, generally a teacher does continuous field investigations regarding birth and deaths in a sample unit[Q] which is followed by a independent survey half yearly by an investigator–supervisor[Q], i.e. it is a dual record system
- The data obtained by both methods is matched and unmatched or partially matched data is re-verified in the field to obtain an unduplicated count of births and deaths
- A sample unit has population of 1500 in rural areas and 1000 in urban areas and there are currently 6671 such sample units (4436 rural and 2235 urban).

Significance

- Sample registration system is a major source of health information
- It provides reliable data for calculation of birth and death rates, age-specific fertility and mortality rates[Q], infant and adult mortality, etc. half yearly.

21. Physical quality of life index (PQLI).

Refer Question No. 16 December 2007 (RS2) Paper I.

22. Residual chlorination.

Refer Question No. 5 June 2011 (RS2) Paper I.

COMMUNITY MEDICINE
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Salient Features

- Includes all the 21 sets of Revised Scheme 2 and 3 question papers of Rajiv Gandhi University of Health Sciences (RGUHS), Karnataka, India
- Important PG entrance points marked to help prepare for PG entrance examinations
- Chapterwise Page References for making it chapterwise thus useful for regular reading and for college internals
- Revised Course Contents (Revised Scheme 3) prescribed by the university also included
- Format similar to other books by the author to make it user friendly
- Index for easy referral at last minute
- All the questions are answered to reduce the workload on the student
- Also included are figures that are essential and sufficient for the question
- Additional information about the topic included in box in reduced font for comprehensive complete coverage of the topic
- Answers are selected from the books commonly referred by the students to avoid confusion during revision for university examination
- A complete comprehensive manual for aspirants of 3rd MBBS examinations and PG entrance examinations.

PG Entrance Points

- With each passing year, competition for PG entrance is getting tougher each day with almost all students aspiring to join postgraduate courses
- Currently, there is no book available which prepares an undergraduate regarding PG entrance. Preparation for MBBS examination is very different from PG entrance preparation
- Take for example, during our undergraduate (UG) preparation, all we study is that BCG is prepared from Bacille Calmette-Guérin but in PG entrance they expect you to know that BCG for mass production is prepared from Danish strain of *Mycobacterium bovis* (WHO)
- An undergraduate would not know such nitty-gritty about subject; because, at that particular moment, his/her target is to clear MBBS
- Considering current scenario and upcoming developments, it was decided to help students by providing them with as much possible finer points of PG entrance during their UG preparation, so that at least these points would be imbibed in their mind throughout. This will help them a lot when they prepare and appear for PG entrance
- These important PG entrance points are marked as "Q" in superscript in text provided as answer
- But let it be clear to all readers that this does not change the basic format of the books, which still retains its Solved Question Paper format. PG entrance points are just an extra effort to help readers to be ready for future challenges.

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