



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) - SEMESTER TWO
END OF SEMESTER EXAMINATION

COURSE CODE : HEA110
COURSE TITLE : Epidemiology
LECTURER(S) : Edward Emmanuel
DATE : 22 April 2025
TIME : 9:00am – 11:00am
DURATION : 2 hours
STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- This paper has 80 multiple choice questions.
- Circle the correct answer on the question paper.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Instruction: Answer all questions by circling the most appropriate answer on the question paper.

1. Analyze the following disease pattern scenario and determine which epidemiological classification it represents: A significant increase in measles cases affecting 15% of a city's population over a two-month period, when the expected baseline is typically less than 1% annually in that region.
 - a) Pandemic
 - b) Endemic
 - c) Epidemic
 - d) Sporadic
2. Analyze how epidemiology functions as a discipline by identifying which of the following best characterizes its foundational analytical approach:
 - a) Application of qualitative interviews and ethnographic observation.
 - b) Integration of probability, statistics, and research methodology to examine population health patterns.
 - c) Development of therapeutic interventions based on individual case studies.
 - d) Interpretation of historical documents to understand disease progression.
3. Analyze the following epidemiological scenario: Dengue fever occurs consistently in the northern coastal communities of Saint Lucia throughout the year, with case numbers that fluctuate within predictable ranges regardless of season. The disease persists without requiring reintroduction from outside areas. Based on this pattern of occurrence, identify the appropriate epidemiological classification:
 - a) Pandemic
 - b) Endemic
 - c) Epidemic
 - d) Imported cluster
4. A person who harbors a specific infectious agent without showing signs and symptoms of the disease is regarded as:
 - a) Vector
 - b) Carrier
 - c) Reservoir
 - d) Amplifier
5. Analyze the following public health activities and determine which epidemiological function they collectively represent:
 - Tracking monthly HIV infection rates across different demographics in a region.
 - Monitoring environmental factors associated with asthma hospitalizations.
 - Comparing disease incidence before and after a public health intervention.
 - Mapping the geographical distribution of vector-borne illnesses over time.
 - a) Health planning.
 - b) Disease surveillance.
 - c) Clinical diagnosis.
 - d) Health promotion.
6. Analyze this epidemiological scenario: In County A, 45 new cases of tuberculosis were identified among its population of 150,000 people during 2024. In County B, 60 new cases were found among 250,000 residents during the same period. Epidemiologists need to determine which county has a greater disease burden to allocate resources appropriately. Which epidemiological measurement tool would be most appropriate for this comparative analysis?
 - a) Mortality rate
 - b) Attack rate
 - c) Incidence rate
 - d) Attributable risk

7. Analyze the differences between the terms 'risk ratio,' 'incidence rate,' 'prevalence,' and 'incidence.' Based on your analysis, which term best describes the number of new cases occurring in a population?
 - a) Risk ratio
 - b) Incidence rate
 - c) Prevalence
 - d) Incidence
8. Analyze the contributions of the below mentioned men to the development of epidemiological methods during the mid-1800s. Based on your analysis, who played a pivotal role in investigating cholera outbreaks in the mid-1800s and advancing spatial epidemiology?
 - a) Robert Farr
 - b) Lind James
 - c) John Snow
 - d) John Lind
9. Which of the following most accurately represents the significant recommendations made following the investigation of the 1854 cholera outbreak?
 - a) Boiling of water
 - b) Filtering
 - c) Chlorination
 - d) Boiling and filtering water
10. Based on your analysis of Joseph Goldberger's research methodology and findings, which of the following diseases did he demonstrate was associated with improper diet rather than an infectious agent?
 - a) Typhoid fever
 - b) Measles
 - c) Pellagra
 - d) Tuberculosis
11. Analyze these interconnected health interventions; Community-wide vaccination programs, clean water infrastructure improvements, surveillance systems tracking disease patterns. Which discipline is fundamentally characterized by these systematic, prevention-oriented approaches to population health?
 - a) Alternative Medicine
 - b) Epidemiology
 - c) Community Health Nursing
 - d) Public Health
12. Select the task that is **NOT** considered a major function of epidemiology in public health practice: A local health department is responding to a sudden increase in foodborne illness cases. The epidemiology team is tasked with various responsibilities to address this public health concern. Which of the following tasks is NOT typically considered a core function of epidemiology in this situation?
 - a) Conduct a case-control study to identify the source of the outbreak.
 - b) Implementing a public awareness campaign about food safety practices.
 - c) Analysing surveillance data to track the spread of the illness over time.
 - d) Evaluating the effectiveness of interventions to control the outbreak.
13. This discipline's purpose is to portray the ongoing patterns of disease occurrence and disease potential so that investigation, control, and prevention measures can be applied efficiently and effectively.
 - a) Treatment
 - b) Analysis
 - c) Contact tracing
 - d) Public health surveillance

14. A public health team is tasked with gathering realistic information about a community to guide their interventions. Based on your understanding of public health practices, which of the following would be the most appropriate task to achieve this goal?
- Community involvement
 - Community Diagnosis
 - Health Information
 - Community participation
15. A patient presents with symptoms of an untreated disease. You are tasked with determining the progression of this disease over time without medical intervention. Which concept best applies to this scenario?
- Acute
 - Chronic
 - Natural history of disease
 - Untreatable
16. Select the concept that refers to the number of deaths from all causes per 100,000 population per year:
- Age –specific mortality rate
 - Crude mortality rate
 - Cause-specific mortality rate
 - Morbidity rate
17. Select the most common measure of central tendency used by researchers and people in all kinds of professions.
- Mode
 - Mean
 - Media
 - Midrange
18. Select the useful measures of diagnostic accuracy.
- Positive predictive value
 - Predictive values
 - Positive and Negative Predictive Values
 - Incidence and prevalence
19. Select the characteristic, condition, or behaviour that increases the likelihood of getting a disease or injury.
- Lifestyle
 - Risk factor
 - Inactivity
 - Immunity
20. A public health team is evaluating strategies to prevent the spread of an infectious disease within a community. They are tasked with analyzing concepts related to resistance within a population. Which of the following best describes the resistance of a group to the invasion and spread of an infectious agent, based on the immunity of a high proportion of its members?
- Immunity
 - Immune response
 - Passive immunity
 - Herd immunity
21. Epidemiological research encompasses several types of study designs. Which one is not a study design:
- Experimental
 - Observational
 - Interview
 - Ecological

22. Select the design that produces the most scientifically rigorous data of all the designs.
- e) Experimental studies
 - f) Observational studies
 - g) Interview
 - h) Ecological
23. Select the concept that refers to a group of people with a common characteristic or experience.
- a) Exposed
 - b) Cohort
 - c) Fixed cohort
 - d) Unexposed
24. Three terms are used to describe the timing of events in a cohort study in relation to the initiation of a cohort study. Which term is incorrect?
- a) Prospective
 - b) Retrospective
 - c) Observational
 - d) Ambidirectional
25. The selection of the exposed group in a cohort study is a critical step that impacts the validity of the study. Identify the factor that most directly influences the choice of the exposed group:
- a) The availability of participants who are willing to participate in the study
 - b) The similarity between the exposed and unexposed groups, except for exposure status.
 - c) The ease of accessing participants with the desired exposure status.
 - d) The prevalence of the outcome of interest in the population.
26. There are several sources for the comparison group in a cohort study:
- a) An internal comparison group
 - b) The general population
 - c) A comparison group
 - d) A, B, C, D
27. This group should be used whenever possible because its characteristics will be the most similar to the exposed group:
- a) The general population
 - b) A comparison group
 - c) An internal comparison group
 - d) Members of another cohort
28. They are used to describe a participant's exposure history in studies of possible adverse health effects stemming from medical procedures
- a) Health records
 - b) The Employment records
 - c) Family records
 - d) Personal records
29. The primary objective of analysing cohort data is to compare the occurrence of:
- a) Symptoms and Disease
 - b) Disease
 - c) Death
 - d) Death, disease, and symptoms
30. A case definition is usually based on a combination of:
- a) Patient preferences, physician experience, and insurance coverage.
 - b) Clinical symptoms, laboratory findings, and epidemiological information.
 - c) Media reports, public opinion, and historical precedents.
 - d) Treatment protocols, recovery timelines, and healthcare costs.

31. In case-control studies, there are guiding principles for the valid selection of controls:
- a) They must come from the same base population as cases
 - b) Controls must be sampled independently of exposure status
 - c) A and B
 - d) Only (b)
32. Select the concept that refers to the probability that an event will occur divided by the probability that it will not occur:
- a) Pathogen
 - b) Odds
 - c) Odds ratio
 - d) Incidence rate ratio
33. Select the studies that typically take a snapshot of a population at a single point in time and therefore usually measure the disease prevalence in relation to the exposure prevalence:
- a) Cross-sectional studies
 - b) Cohort studies
 - c) Ecological studies
 - d) Case – control studies
34. A characteristic of this group of studies is that it examines the rates of disease in relation to a factor described on a population level. The units of analysis are populations or groups of people rather than individuals:
- a) Case –control studies
 - b) Cross-sectional studies
 - c) Ecological studies
 - d) Cohort studies
35. Select the key features that distinguishes traditional ecological study from other epidemiological studies:
- a) The population unit of analysis
 - b) An exposure status that is the property of the population
 - c) Feature A
 - d) Features A and B
36. Select the Ecological studies that usually identify groups:
- a) Place
 - b) Time
 - c) Place and Time
 - d) C
37. These studies investigate the role of some factor or agent in the prevention or treatment of a disease. In such a study, the investigated assigns individuals to two or more groups that either receive or do not receive the preventive or therapeutic agent:
- a) Ecological studies
 - b) Experimental studies or trials
 - c) Cross-sectional studies
 - d) Sociological studies
38. Select the Experimental studies that are commonly classified by
- a) Whether they investigate a measure that prevents disease occurrence
 - b) Treats an existing condition
 - c) Only B
 - d) Both A and B

39. Select the aspect that before an epidemiological study is launched, the investigator must formulate:
- a) An action plan
 - b) The type of study design
 - c) A hypothesis
 - d) Practical and ethical problems
40. Select the are several types of experimental studies or trials
- a) Observation
 - b) Preventive and therapeutic; individual and community
 - c) Parallel, crossover, simple, factorial
 - d) B and C
41. Select the concept that refers to the probability that the observed result is attributable to chance, an uncontrollable force that seems to have no assignable cause:
- a) Error
 - b) Selective Error
 - c) Random Error
 - d) Systematic Error
42. What concept refers to a systematic error committed by the investigator during the course of a study:
- a) Type 1 error
 - b) Type 2 error
 - c) Bias
 - d) Deliberate
43. Select the studies which are more susceptible to bias than other studies:
- a) Prospective studies
 - b) Ecological studies
 - c) Retrospective studies
 - d) None of the above
44. Select the main types of bias :
- a) Selection
 - b) Information (observation)
 - c) Only A
 - d) A and B
45. Select the most appropriate response when evaluating a study for the presence of bias, noting that it is important to:
- a) Identify its source
 - b) Estimate its magnitude
 - c) Assess its direction; Estimate its magnitude; Identify its source
 - d) C
46. Little can be done to fix or remove a bias once it has occurred. Select what the investigator must do to avoid bias?
- a) Carefully designing the study
 - b) Carefully conducting the study
 - c) Only B
 - d) Both A and B
47. Select the concept that is defined as the mixing of effects between an exposure, an outcome, and a third extraneous variable.
- a) Confounder
 - b) Confounding
 - c) Distortion
 - d) Distribution

48. Line graphs show the behaviour over time, select the most appropriate response that describes Line graphs.
- a) Time is marked on the horizontal axis
 - b) The variable being plotted is marked on the vertical axis
 - c) The variable being plotted is on the horizontal axis
 - d) A and B
49. Bar graphs compare the values of several variables. Often, the values compared are frequencies or relative frequencies of outcomes of a nominal variable. They exhibit certain characteristics, therefore select the correct answer:
- a) The bars in a bar chart may be vertical or horizontal
 - b) They may touch each other or be separated
 - c) All the bars must have the same width and height that varies with the variable being graphed
 - d) A, B, C
50. This chart is a circular statistical graphic, which is divided into slices to illustrate numerical proportion:
- a) A bar graph
 - b) A histogram
 - c) A pie chart
 - d) A polygon
51. This phenomenon refers to an immune response leading to damage to host tissues, select the correct answer.
- a) Sensitivity
 - b) Hypersensitivity
 - c) Immunocompromised
 - d) Immunodeficiency
52. The presence of living infectious agents on the exterior surfaces of the body or articles of apparel or soiled articles is:
- a) Infection
 - b) Infectious
 - c) Contamination
 - d) Contaminant
53. Select the concept that refers to the ability of a pathogen to produce a specific clinical reaction after infection occurs:
- a) Infectivity
 - b) Pathogenicity
 - c) Virulence
 - d) Immunogenicity
54. Select how Infectious diseases can be transmitted:
- a) Horizontally
 - b) Vertically
 - c) Horizontally and Vertically
 - d) None of the above
55. Select the factor(s) that refer to the concept that Infection does not always lead to disease, but depends on:
- a) The Infective dose
 - b) The infectivity of the infectious agent
 - c) The immunocompetence of the host
 - d) A, B, C

56. Select the characteristic of the host that may influence the spread of a disease are:
- a) Host resistance, immunity
 - b) Herd immunity, infectiousness of the host
 - c) Only B
 - d) A and B
57. Higher immunization coverage will lead to:
- a) Greater herd immunity
 - b) Block the further spread of the disease
 - c) Only A
 - d) A and B
58. Select the concept that refers to the physical, biological, social, and cultural factors that are external to the human host.
- a) Communicable diseases
 - b) The Environment
 - c) All the above
 - d) None of the above
59. Select arthropods that can transmit infectious agents:
- a) Snails
 - b) Bats
 - c) Mosquitoes
 - d) A, and C
60. The most severe threat posed by diarrhoea is:
- a) Severe abdominal pain
 - b) Persistent loss of fluids
 - c) Dehydration
 - d) Lethargy
61. Key measures to treat diarrhoea include:
- a) Rehydration with oral rehydration salts (ORS)
 - b) Use of Zinc supplements
 - c) Rehydration with intravenous fluids in case of severe dehydration
 - d) A, B, C, D
62. This concept refers to causation: the doctrine of causes; the study of causes; specifically, the cause of disease.
- a) Physiology
 - b) Etiology
 - c) Psychology
 - d) Microbiology
63. This is a general term for conditions affecting the heart or blood vessels. It is usually associated with a build-up of fatty deposits inside the arteries (atherosclerosis) and an increased risk of blood clots. It can also be associated with damage to arteries in organs such as the brain, heart, kidneys and eyes.
- a) Osteoporosis
 - b) Malignancy
 - c) Cardiovascular diseases
 - d) Atherosclerosis
64. It is a multi-generational diagram of a person's family and social network. Medical professionals use it to assist individuals in identifying health and medical risk factors.
- a) Mammogram
 - b) Genogram
 - c) Ecogram
 - d) Genome

65. An extensive history of heart disease, diabetes, sickle cell or mental illness:
- a) May indicate a predisposition for these diseases
 - b) Assist the individual in making wise lifestyle choices
 - c) Only A
 - d) Both A and B
66. These are key modifiable risk factors associated with the risk of developing cancer and other chronic diseases.
- a) Diabetes, Cardiovascular disease
 - b) Tobacco use, alcohol consumption, and excess body weight
 - c) Only A
 - d) Both A and B
67. Which is not a non-modifiable risk factor?
- a) Age
 - b) Ethnic background
 - c) Family history of heart disease
 - d) Socioeconomic status
68. This factor is likely responsible for passing on the risk of developing coronary heart disease:
- a) Hormones
 - b) Genes
 - c) Lifestyle habits
 - d) B and C
69. It is estimated that 38 million deaths occur annually as a result of Non-Communicable Diseases. Which are the world's largest killers?
- a) Heart and lung diseases
 - b) Cancers and Diabetes
 - c) B
 - d) A and B
70. An individual risk of developing coronary heart disease is increased if:
- a) The father or brother was diagnosed with the disease, or had a cardiac event under the age of 55
 - b) The mother or sister was diagnosed with the disease or had a cardiac event under 65
 - c) A, B, C
 - d) Only A
71. Given the following observations: 5,7,11,8,4,7,7,9,6,10. Calculate the mean.
- a) 6.7
 - b) 7.4
 - c) 7.7
 - d) 8.7
72. Given the following observation: 5,7,11,8,4,7,7,9,6,10. Calculate the mode.
- a) 10
 - b) 11
 - c) 7
 - d) 8.7
73. Given the following observation: 5,7,11,8,4,7,7,9,6,10. Calculate the median.
- a) 7
 - b) 14
 - c) 8
 - d) 11

74. Country A with a population of approximately 180,000 persons reported 20 cases of COVID-19 in 2020, and 2015 cases from Jan 2021 to February 11, 2021 with 20 deaths. Calculate the incidence rate for 2020.
- a) 0.1/1000
 - b) 0.001/1000
 - c) 0.001/1000
 - d) 0.0001/1000
75. Calculate the incidence rate for January 2021 to February 2021
- a) 11.19/1000
 - b) 0.011/1000
 - c) 0.0111/1000
 - d) 0.01119/1000
76. Calculate the cumulative incidence of mortality
- a) 10.9/1000
 - b) 0.0001/1000
 - c) 0.001/1000
 - d) 0.1000/1000
77. Given the incidence rates of mortality for District A were 300/20,000 person years; and District B, 200/15,000 person years. Calculate the combined incidence rate of mortality for the two districts:
- a) 14.82/1000
 - b) 14.28/1000
 - c) 14.22/1000
 - d) 0.1000/1000
78. The burden from child injury is most felt in these countries, where 95% of all child-injury deaths occur, and where recorded rates of child maltreatment are substantially higher.
- a) High income countries
 - b) Middle income countries
 - c) Low income countries
 - d) Low and middle income countries
79. Neglect is the failure to meet a child's basic needs due to:
- a) Physical neglect
 - b) Emotional neglect
 - c) Extreme poverty
 - d) A, B, and C
80. Factors that can affect the risk of unintentional injury and violence are:
- a) Individual behaviours
 - b) Physical environment
 - c) Access to services
 - d) A, B, and C

END OF EXAMINATION