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**School: Africa Institute for project management studies**

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**MODULE 3 ASSIGNMENT**

Q1. **Distinguish between descriptive epidemiology and analytical epidemiology?**

1. In summary, the purpose of an analyti**c** study in epidemiology is to identify and quantify the relationship between an exposure and a health outcome. ... Cross-sectional studies measure exposure and disease status at the same time and are better suited to descriptiveepidemiology than causation.
2. Descriptive epidemiology provides a way of organizing and analyzing these data to understand variations in disease frequency geographically and over time, and how disease (or health) varies among people based on a host of personal characteristics (person, place, and time)
3. **There are four main types of analytical studies:**
4. Ecological source.
5. Cross-sectional source.
6. Cohort source.
7. Case-Control source.
8. Related source.
9. External source.
10. References source.
11. The two most common types of observational studies are cohort studies and case-control studies; a third type is cross-sectional studies.
12. Cohort study. A cohort study is similar in concept to the experimental study. ...
13. Case-control study. ...
14. Cross-sectional study

Q 2. **Write down and explain the mathematical expression of the following**?

1 1. mathematics, an equation is a statement of an equality containing one or more variables. Solving the equation consists of determining which values of the variables make the equality true. ... A conditional equation is true for only particular values of the variables.

. Incidence:

ii. Prevalence

The terms "incidence" and "prevalence" refer to the number of people who have a medical condition. "Incidence" means the number of people who are newly diagnosed with a condition, while "prevalence" includes newly diagnosed people, plus people who were diagnosed in the past, and, if the information is obtainable, people who haven't been diagnosed. These terms are confusing, and some people use them interchangeably (even though they're not interchangeable).

Incidence describes the current risk of getting a certain disease, while prevalence tells us how many people currently live with the condition, regardless of when (or even whether) they've been diagnosed with that disease.

Q3. **Apart from Randomized trials, describe four (4) other epidemiological research designs**

1. The evidence for evidence-based medicine is all collected via research, which uses a variety of study designs. We are learning about "critical appraisal of the literature," and judging the quality of a study design is a central part of this. Different study designs provide information of different quality.
2. Traditional Epidemiological Methods. Traditional epidemiological methods measure the distribution of viral infections, diseases, and associated risk factors in populations in terms of person, place, and time using standard measures of disease frequency, study designs, and approaches to causal inference.
3. The design of a study defines the study type (descriptive, correlation, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research problem, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods.
4. Most research can be divided into three different categories; exploratory, descriptive and causal. ... this overview present all three types of research, and how they fit in a research plan.

**Q4. Data from hospital records are one of the most important sources of information in**

**epidemiologic studies**?

1. **Outline the limitations of using hospital data.**
2. EPIDEMIOLOGICAL investigation in hospitals is not new. In the past its use has been discouraged by those who maintained that the data would not be sufficiently representative to be of research value. The passage of time and experience have shed doubt on this attitude; and numerous examples of the value of epidemiology in hospitals can now be found in the literature. As hospitals have grown in importance with respect to the medical needs of communities, they have also become more valuable resources for the epidemiologic study of disease in populations.
3. A Definition of "Epidemiology in Hospitals" "Epidemiology in Hospitals" may be defined as any investigation relating cases identified in hospitals to a population obtained from either these same hospitals or a definable community served by these hospitals. The purpose is to discover attributes associated with the cases or the frequency and distribution of the cases which may lead to a better understanding of the cause and prevention of these conditions. This definition implies two types of studies, depending on whether the population at risk (the denominator population) or the control group is derived from within hospitals or from the community at large. The cases (the numerator population) are detected within hospitals.
4. Type one studies, "Epidemiology within Hospitals," are restricted to cases and controls drawn from one or more institutions.
5. Type two studies, "Community-wide Hospital Epidemiology," usually involves those cases which are drawn from all hospitals serving a community and which can be related to a geographically defined community population. My definition is admittedly broad; but it is defensible based on the fundamental operations in epidemiology -namely, relating case populations to "at risk" or control populations. This session on "Epidemiology in Hospitals" further bears out this viewpoint, as evidenced by the wide range of epidemiologic studies which can be performed in hospitals. The administration and even to community action. This will be confined mainly to inpatient hospital studies. The same

2. Potential Uses Possible Type 1 Studies (Epidemiology within Hospitals) 1. To study disease resulting from hospitalization 2. To study the natural history of a disease 3. To study attributes associated with disease 4. To study associations between diseases 5. To facilitate cooperative experimental, clinical, and epidemiologic studies Possible Type II Studies (Community-wide Hospital Epidemiology) 1. To determine disease morbidity 2. To describe demographic and geographic patterns of disease 3. To identify instances of familial occurrence of disease 4. To facilitate comparative study of hospital and death certificate indexing of causes of death 5. To study administrative planning principles, apply to outpatient investigations except that good diagnostic indexes are not usually kept on outpatients. Various health insurance plans, such as the Health Insurance Plan of Greater New York and the Kaiser Foundation Health Plan, have highly efficient diagnostic indexing of outpatient as well as inpatient services; and these records have been used for research purposes.'13 Type I Studies: "Epidemiology within Hospitals"-The studies included in this category have not ordinarily been considered epidemiologic. The analytic technics utilized, however, are entirely analogous to those in epidemiology. They involve populations of cases rather than individual patients; and they embody a comparison of those cases with either a population at risk or with a control population. Such methods are employed most obviously in studies of illness resulting from hospitalization, e.g., hospital-acquired infections,4 adverse effects of drugs,5 and delayed effects of medical treatment such as x-ray exposure.6,7 Epidemiologic methods can be applied to hospital data to study the natural history of disease after a certain stage of diagnosis. For example, do any important personal, physiological, or environmental factors affect prognosis in cancer? To investigate such possibilities, one may do a case-control study comparing a population of cancer cases with attribute X to another population of cancer patients without the X attribute.8 One may also apply life-table methods to hospital data to study the prognosis of a rare disorder such as systemic lupus erythematosus, as was done by Merrell and Shulman.9 Patients identified in a hospital with an abnormal laboratory test, e.g., a chronic biologic false-positive Wasserman test10 or a positive L.E.-cell test,11 are being followed to determine the disease implications of such abnormal tests. Hospital data can yield important clues as to whether attributes are associated with disease. For example, cigarette smoking associated with lung cancer was first suspected from hospital studies. The validity and the magnitude of this association was then confirmed by larger and more carefully controlled population studies.12 Mantel and Hansel cite many retrospective studies of cancer in which hospitalized cases and matched controls have been used in search of attributes associated with disease.'3 Many such studies have come from the Roswell Park Memorial Institute, partly because of its policy of administering routinely a comprehensive, general purpose interview to all patients admitted. Some respondents with an initial diagnosis of cancer may be found subsequently not to have such a diagnosis. These patients have been used effectively as controls for those with a documented diagnosis of cancer. Analogously, hospital data can be used to study associations between disease

b**) Describe the possible sources of error in interview surveys?**

1. A common form of this last source of systematic error is called —parallax error, “which results from the user reading an instrument at an angle resulting in a reading which is consistently high or consistently **low**. Random errors are errors that affect the precision of a measurement.

2. **TYPES** OF EXPERIMENTAL. **Errors** are normally classified in **three** categories: systematic **errors**, random **errors**, and blunders. Systematic **errors** are due to identified causes and can, in principle, be eliminated. **Errors** of this **type** result in measured values that are consistently too high or consistently too low.

3. Measurement errors are those errors in the survey observations that may be caused by interviewers, respondents, data processors, and other survey personnel. Often, the causes of measurement errors are poor questions or questionnaire design, inadequate personal training or supervision, and insufficient quality control.

5**. Explain the main determinants of health**

**1** The determinants of health include: the social and economic environment, the physical environment, and. the person's individual characteristics and behaviors.

1. Scientists generally recognize five determinants of health of a population:
2. Biology and genetics. Examples: sex and age.

4 Individual behavior. Examples: alcohol use, injection drug use (needles), unprotected sex, and smoking.

1. Social environment. ...
2. Physical environment. ...
3. Health services.