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The University of Zambia
School of Medicine
Department of Biomedical Sciences
BMS 4415 Research Methodology Test 1

Date: 25th November 2015 Time: 16.00 to 18:00 Hrs.

Section A: Short Questions. Answer ALL the 4 questions in this section. Each question carries 10 marks and MUST be answered on a SEPARATE answer sheet

Short notes

1. Distinguish research designs from research methods.
2. Briefly describe the four types of validity criteria in research. (*measurable validity, internal, external, ecological*)
3. Define the null hypothesis and explain how the null hypothesis is different from the research question.
4. What is a research question and mention or list four conditions under which this may be met with.

SECTION B: Long Essay Questions: There are 4 questions in this section. Answer any 3 questions. Each Question must be answered in a separate booklet. Each question carries 20 marks.

Long Essay

1. Describe in detail the basic steps in the research process.
2. Discuss key issues related to maintaining the integrity of data collection in scientific research.
3. For a specific aims of a research project to be clear they need to be written in a 'SMART' way.
 - a) ~~Name and~~ briefly describe what is meant by 'SMART'.
 - b) ☒ you design a research project where you want to compare the efficacy of a trial medication (Munzac) in HIV patients over a 2 year period after monitoring HIV viral load at baseline, 3-, 6-, 12, 18 and 24 months. *State your specific aim in a smart way.*
4. Describe all the steps evolved in the check list of the Literature Review.

End of Test

2080
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The University of Zambia - School of Medicine
Department of Biomedical Sciences

BMS 4425 Research Methodology Test 1

Date: 7th December, 2016

Time: 16:30 - 18:30Hrs.

SECTION A: Short Answer Questions. Answer ALL four (4) questions in this section. Each question carries 10 marks and MUST be answered in a SEPARATE booklet, clearly marked with Student computer number.

1. Using a specific example, explain the difference between a research question and a hypothesis. Under what types of research is a research question versus a hypothesis used? [10 marks]
2. Specific aims OR objectives are better written in a 'SMART' way. Using specific examples, explain what a 'SMART' specific objective refers to. [10 marks]
3. Discuss the advantages and disadvantages of quantitative and qualitative research approaches. [10 marks]
4. With respect to criteria applied in research, discuss specifically the aspect of validity. [10 marks]

SECTION B: Long Essay Questions: Answer any three (3) of the four (4) questions in this section. Each question carries 20 marks and MUST be answered in a SEPARATE booklet, clearly marked with Student computer number.

1. Discuss the importance of data collection in the research process. Explain the steps and considerations you would make in planning your data collection for a clinical research study. [20 marks]
2. The categories of research types are often presented in pairs. For the four (4) categories studied, compare and contrast the characteristics of EACH PAIR. [20 marks]
3. Discuss in detail any five (5) of the concepts considered in research design. [20 marks]
4. With respect to sampling:
 - a. Distinguish carefully between stratified sampling and cluster sampling, stating the benefits and drawbacks of each method. [10 marks]
 - b. A country is divided into regions and in each region there are both urban and rural areas. A survey is planned in which adults are to be interviewed. Devise a sampling scheme which is a combination of stratified, cluster and quota sampling. [5 marks]
 - c. A village has 506 inhabitants, listed by name and address in a register. Explain in detail how to take a systematic sample of about 50 inhabitants from this list. State the benefits and drawbacks of this method. [5 marks]

End of Test

Steps, data dictionary
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Section A: Answer all the four (4) questions. Each question weighs 10 marks

1. Describe the three (3) main factors which causes epidemic diseases occurrence [10 marks]

2. Regarding qualitative research methods:

- What are the analytical aims of qualitative data analysis? [2 marks]
- Mention any three (3) typologies of qualitative study design. [3 marks]
- List any three (3) methods of collecting qualitative data. [3 marks]
- Describe the principle underlying the following methods of qualitative analysis:
 - Content analysis [1 mark]
 - Narrative analysis [1 mark]

3. With regards to birth rate, a factor related to measures of disease risk or occurrence:

- Define Natality, with specific attention to Crude and Specific Natality. [2.5 marks]
- Define Fertility, with specific attention to Realised and Potential fertility. [2.5 marks]
- Given 250 births in one year in Lusaka district with a population of 8,572 people, calculate Crude and Specific natality [5 marks]

Crude 280

2.9% specific natality

4. What is the role of epidemiology in public health practice? [10 marks]

(a) The aim is to generate a sample which allows understanding the phenomenon of interest.

(b) (i) Ethnography
(ii) Grounded Theory
(iii) Case Study

(c) (i) Observational
(ii) Interviews
(iii) Focus group discussion

(d) (i) Descriptive and interpretative
(ii) The action research experiences

(e) (i) A change in the ecology of the host population.
(ii) increased pressure

- Natality crude is the number of new individuals per unit time.

- Specific natality number of new members divided by the population size

$$\frac{8572}{2} = 17144$$

$$\frac{25000}{8572} = 17144$$

$$\frac{17144}{8572} = 15716$$

Section B: Answer any two (2) questions. Each question weighs 20 marks

1. Semba Village in Luangwa District is endemic to Bancroftian Filariasis. Risk of infection is related to occupational exposure and the population at risk comprises of 490 males. 90 males develop symptoms consistent with acute bancroftian filariasis and are confirmed by laboratory testing to have been infected with *Wuchereria bancrofti*. 40 males developed filariasis in September and 50 developed filariasis in October. Calculate the incidence rate of filariasis for those two months? [20 marks]

2. As an epidemiologist at a local health facility, you are approached by a ward councillor in one of the communities in Chongwe District. He informs you that there is a strange disease affecting people in his community and is spreading fast. Affected individuals are presenting with vomiting and diarrhoea, and the disease has led to two people dying. He is concerned about the disease and the community needs help urgently.

- Upon receiving such an alarming report, what would come to your mind immediately and why? [5 marks]
- List the various steps involved in investigating a communicable disease outbreak. Briefly discuss each of these steps [15 marks]

3. Discuss the role of the biomedical laboratory in disease outbreak investigations [20 marks]

Defining the existence of the epidemic
 - Confirm the diagnosis
 - Define case and conf cases
 - analyze data in terms of onset time place persons

- prepare for field work
- verify the diagnosis
 - establish existence of an epidemic
 - Identify and conf cases
 - Data only (1)
 - Formulate hypothesis / theory
 - Assess the local response to the outbreak
 - Set immediate control measures
 - Address resource gap

End of Test, Best wishes

90 - total number

40 - sep 90
 50 - oct 90

$$\frac{40}{90} \times 100$$

$$\frac{400}{9} = 44.44\%$$

$$\frac{40}{490} \times 100$$

$$= 8.16\%$$

University of Zambia

School of Medicine

Department of Biomedical Sciences

BMS 4415 Research Methodology

TEST 1

Date: 21st October 2014

Time: 14:00-16:00

Section A: Short Questions. Answer ALL THE 4 questions. Each question MUST be answered on a SEPARATE answer sheet

1. Briefly explain the term "sampling" as referred to in research and mention the methods used with examples. [10 marks] *Sampling is a process of selecting a sample.*

2. Briefly define the following observational studies [10 marks]:

- a) Descriptive studies
- b) Ecological studies *aka ecological bias*
- c) Ecological fallacy *aka Correlational Studies.*
- d) Cross-sectional studies
- e) Case-control studies

3 a) Why is it important to spend time when formulating the research problem? [4 marks]

b) What considerations would you have to take into account when you are formulating the research problem for your undergraduate research project? [6 marks]

Section B: Essay Questions. Answer 3 OUT OF 4 questions. Each question MUST be answered on a SEPARATE answer sheet. Each question carries 20 marks.

1. With the help of a flow chart define all the steps necessary to effectively carry out a research and the desired sequencing of these steps.

2. What is the checklist of the literature review and explain each component.

3. What is research question? Define the main issues which should receive the attention of the researcher in formulating the research question. Give suitable examples to elucidate your points.

4. Why is probability sampling generally preferred in comparison to non-probability sampling? Explain the procedure of selecting a simple random sample.

Q 3 (b) It is important to spend time on the research problem because the research problem identifies your destination, It tells you, your supervisor and readers what you intend to do (research) Everything that follows in research process (Study design, Measurement, Sampling strategy, frame of analysis and the style of writing depend on the research problem.



The University of Zambia - School of Health Sciences
Department of Biomedical Sciences

BMS 4425 Research Methodology Test 1
Date: 7th December, 2017 Time: 08:00 - 10:00Hrs.

research is, systematic, objective, systematic, rigorous investigation of a problem or situation

SECTION A: Short Answer Questions. Answer ALL three (3) questions in this section. Each question carries 10 marks and MUST be answered in a SEPARATE booklet, clearly marked with Student computer number.

- Intervention analysis*
1. Compare and contrast the characteristics of the following paired research types: Descriptive versus Analytical and Basic versus Applied. Highlight the purpose of each, the focus each takes and data each uses. [10 marks]
 2. With regards to variables:
 - a. Define and give examples of the following variables: Dependent, Independent and Confounding variables. [5 marks]
 - b. Define a "control" and discuss its role in a research. [5 marks]
 3. Define research and briefly discuss the role that research plays in Biomedical science and Clinical medicine. [10 marks]

An independent variable is variable that is antecedent to the dependent variable

research is, systematic, objective, systematic, rigorous investigation of a problem or situation

Intervention analysis

SECTION B: Long Essay Questions: Answer any two (2) of the three (3) questions in this section. Each question carries 20 marks and MUST be answered in a SEPARATE booklet, clearly marked with Student computer number.

- Intervention analysis*
- ① Discuss how the four (4) aspects of "validity", a criterion in research, are related to research designs. [20 marks]
 - ② While Cross-sectional and longitudinal research designs have similarities in characteristics, discuss four (4) particular challenges unique to longitudinal research design. [20 marks]
 - ③ For specific aims of a research project to be clear they need to be written in a 'SMART' way.
 - a. Name and briefly describe what is meant by 'SMART'.
 - b. Design a research project where you want to compare, the efficacy of a trial medication (Munzac) in HIV patients over a 2 year period after monitoring HIV viral load at baseline, 3-, 6-, 12, 18 and 24 months.

[20 marks]

End of Test



The University of Zambia
School of Health Sciences
Department of Biomedical Sciences

Research Methodology, Biostatistics and Epidemiology BMS 4430 /RAD 4620

Epidemiology Component

Date: 14th October, 2022

Time: 14:15 - 16:15

Venue: RIDGEWAY CAMPUS LECTURE THEATRE 1 & 2

Instructions:

1. This paper consists of three (3) sections; A, B and C. Answer ALL the Questions.
2. Answer each section on a SEPARATE paper
3. On each answer sheet, indicate your Student Computer Number, the section and question number for ALL questions clearly.
4. Time allowed for this test paper is **2 hours**

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SECTION A [20 marks]

QUESTION 1

Draw a diagram showing the key events in the natural history of a disease. Indicate at which time screening would be most appropriate. [5 marks]

QUESTION 2

Screening is an approach used to detect disease in asymptomatic individuals and lead time is an important aspect of screening. A new screening test for a Cancer is to be evaluated. The test is administered to 1,350 people of whom 414 are known to have the Cancer. The new screening test identified 367 of the Cancer patients as positive for the Cancer, but also identified 175 of the disease-free as positive for the disease.

- Define "lead time" and explain its relevance. [2 Marks]
- Construct a 2 x 2 table [2 marks]
- Calculate the sensitivity of the test [1.5 marks]
- Calculate the specificity of the test [1.5 marks]
- Calculate the positive and negative predictive values [3 marks]

QUESTION 3

Epidemiology is "the (quantitative) study of the distribution and determinants of health-related states and events in a defined population, list four (4) uses and core functions of epidemiology [5 marks]

SECTION B [30 marks]

QUESTION 1

Among 100 people at baseline being followed up in your health facility, 20 develop influenza over a year. Assuming that among the 100 people at risk, 50 are men and 50 women. If 15 men and 5 women develop influenza. Calculate:

- The odds and the risk [5 marks]
- The odds ratio [5 marks]

QUESTION 2

With regards to measures of disease occurrence, you walk in to the Out-patient department and find 200 asthma patients. 30 of the 200 tell you they have had an asthma attack during the last one year, while 14 of the same 200 tell you that they are in an attack at the point in time you are talking with them. Calculate:

- The point prevalence [10 marks]
- The period prevalence [10 marks]

SECTION C [20 marks]

QUESTION 1

Define each of the following giving examples:

- Define public health disease surveillance. [2 Marks]
- Endemic disease [2 marks]
- Epidemic [2 marks]
- Pandemic [2 marks]
- Iceberg concept [2 marks]

QUESTION 2

Prevention of diseases and infections is an important aspect of public health, describe the three level of prevention of disease. (5 marks)

QUESTION 3

What is the multi-causality model or theory of disease? What type of diseases does it mostly apply to? [2 Marks]

QUESTION 4

Compare and contrast communicable and non-communicable diseases [3 marks]

.....The end!.....