Chattogram Veterinary and Animal Sciences University
One Health Institute
MS in Applied Veterinary Epidemiology
Semester-II (January-June) Final examination 2021
Subject: Disease Surveillance (Code: DSE-602)
Total marks: 50

(Answer the following questions. Figures in the right margin indicates full marks)

1. a. Describe the concept and purposes of disease surveillance in animal health sector.   5
    b. How would you differentiate survey and census from surveillance?   3
    c. Enlist the common sources of denominator and numerator data in disease surveillance   2
    in Bangladesh.

2. a. Mention the major steps in a typical surveillance system.   2
    b. What are the components of a good questionnaire?   3
    c. What are the major drawbacks of passive surveillance?   3
    d. Differentiate sentinel and risk-based surveillance.   2

3. a. Which surveillance system is dominating in Bangladesh? Sketch its information flow.   4
    b. Discuss the limitations of a developing country that may hinder a surveillance system.   6

4. a. A test is used to screen cattle for brucellosis. The sensitivity of the test is 95% and the   10
    specificity of the test is 90%. Assume that the total number of cattle being tested for
    brucellosis is 50,000. Assume that the true prevalence of brucellosis in the population is
    100 per 50,000. Answer the following using the above information:
    i. Construct a 2X2 table with appropriate numbers.
    ii. Calculate the PPV and NPV of the test and interpret the results.
    iii. How would you interpret 95% sensitivity and 90% specificity of the test?

5. a. What is a receiver operating characteristic plot (ROC curve) as applied to a diagnostic   5
    test? What are its advantages?
    b. Discuss how parallel and serial testing methods increases sensitivity and specificity,   3
    respectively?
    c. How does prevalence affect the PPV of a test?   2

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Fundamentals of Public Health
Code: FPH-601
Full marks: 40, Time: 2 hours

(Figures in the right margin indicate full marks. Answer **any 5 questions** from the following)

1. a. Mention concept and practices of Public Health in Bangladesh context. 4
    b. Mention various core contents of Public Health and classify determinants 4
    of health.

2. a. Mention the existing Public and Private Public Health facilities in our
    country to cope Public Health challenges. 4
    b. What are the natural disasters and describe the steps in investigating
    an outbreak in our settings. 4

3. Write short notes on (Any two): a. Globalization of Health,
    b. Evidence Based Medicine (EBM) and c. Public Health Policy 4X4

4. a. Mention the principles and strategy for control of Communicable diseases. 4
    b. Mention the 10 important land marks in the history of Public Health 4
    in Bangladesh.

5. a. As a Public health member how we can prevent and control COVID 19 4
    Pandemic.
    b. Write down mission of One Health and modern Public Health System. 4

6. a. Mention the various levels of prevention with examples. 4
    b. Describe Health Education and Promotion. 4

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Extended Epidemiology and Research Methodology (Theory)
Code: ERM-601
Full marks: 40, Time: 2 hours

(Figures in the right margin indicate full marks. Answer any **4 questions** from the following)

1. a. What do you understand by epidemiologic triad?   5
    b. Define the following terms: determinants, risk factors, outcome variable, endemic disease   5
    and epidemic disease.

2. a. Differentiate the following: experimental study design and observational study design,   5
    analytic study design and descriptive study design.
    b. To investigate a rare disease which study design will you choose? Describe it briefly with   5
    the help of an example.

3. a. Describe the tools to measure the frequency of pneumonia among the children that visits   5
    primary schools of Chattogram metropolitan area.
    b. The rate and rate ratio of CHD in smokers was found 0.034 and 2.56 in a study,   2
    respectively. Interpret the results.
    c. Define herd immunity with an example.   3

4. a. Write down the advantages and limitations of cross-sectional study.   3
    b. 'Cohort study is not suitable for rare events' – justify the statement?   4
    c. Why experimental study designs are designated as 'gold standard'?   3

5. Write short notes (any 2):   5X2
    i. Confounding and interaction
    ii. Application of epidemiology in public health
    iii. Basic and net case reproduction number

One Health Institute
Chattogram Veterinary and Animal Sciences University
January-June MPH (One Health) Final Examination-2021
Course Title: Outbreak Investigation and Surveillance (Theory)
Course Code: OIS-601
Total marks: **40**; Allocated Time: **2.0** hours

Answer any five (5) questions from the followings:

1. Define endemic, epidemic, sporadic and pandemic with examples. Briefly describe the methods used in probability sampling.   8.0

2. Differentiate between monitoring, survey and surveillance. Briefly describe the types of surveillance. Why we investigate an outbreak?   8.0

3. What are the steps of outbreak investigation? Briefly discuss about the preparations of outbreak investigator before fieldwork.   8.0

4. Write down the purpose of surveillance. Differentiate between animal health and public health surveillance in Bangladesh.   8.0

5. Briefly discuss the existing public health surveillance system in Bangladesh.   8.0

6. What is the objectives of the scientific writing? Briefly describe the different parts of an original scientific manuscript.   8.0

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Extended Epidemiology and Research Methodology (Practical)
Code: ERM-601
Full marks: 20, Time: 1 hour

(Figures in the right margin indicate full marks. Answer **any 2 questions** from the following)

1. A researcher follows 200 women who exercise regularly and 300 women who do not exercise 10 regularly. After 30 years of follow-up, 20 of the women in the exercise group are diagnosed with osteoporosis while 30 women in the non-exercise group are diagnosed with osteoporosis.

   a. Draw the 2X2 contingency table showing the disease on top and the exposure on the side.
   b. Calculate the relative risk of developing osteoporosis between the two groups.
   c. Interpret the result.

2. Researchers determine in a case control study that 20 of 100 patients with bladder cancer smoke 10 cigarettes while 40 of 600 patients without bladder cancer smoke cigarettes.
   a. Calculate the appropriate measure of association for developing bladder cancer in smokers vs. non-smokers.
   b. Interpret the measure of association you calculated.

3. A study looked for an association between severe maternal anemia in the later stage of 10 pregnancy and low birth weight in their babies. All low birth weight (LBW) babies born in one maternity clinic were identified over one year. A representative group of babies without LBW was also selected over the year. For all these babies the clinical records were used to get the hemoglobin levels of the mother during pregnancy.

   a. Which study design they followed?
   b. Identify the outcome and exposure variable.
   c. Which measures of frequency and measures of effect can be calculated from this design?

᛫One Health Institute
Chattogram Veterinary and Animal Sciences University
January-June MPH (One Health) Final Examination-2021
Course Title: Outbreak Investigation and Surveillance (Practical)
Course Code: OIS-601
Total marks: **20**; Allocated Time: **1.0** hour

Answer any Two (2) questions from the followings:

1. **Scenario:**   10.0

    Nipah virus (NiV) is considered as highly pathogenic virus with the ability to cause devastating morbidity and mortality in human populations. This disease frequently causes outbreak and has become one of the most alarming threats of the public health in Bangladesh. It is therefore important to conduct comprehensive investigation of NiV infections with the aim of prevention and control of human causality. The behaviour of the dynamics of NiV infections has been illustrated as follows: The NiV can cause human infection through raw date palm sap consumption, which can then make human-to-human transmission of infection. In background history, NiV infection was first detected in Bangladesh in 2001. It was also identified in India for the first time in 2001 and then in 2007. Unfortunately, 11 (eleven) outbreaks have already occurred in Bangladesh since the first detection of NiV in 2001, with highly mortality rate an estimated 80% in an average and 100% in some cases. The most alarming fact is that almost every year in winter (December to March), the deadly NiV strikes in the north and western regions of Bangladesh. Until at the end of 2008, about 14 districts of Bangladesh were affected by NiV outbreaks, which at the end of 2013, have been expanded to more than 22 districts of north-western and central regions of Bangladesh.

    Question: How will you collect information on NiV infections from community? How will you investigate NiV outbreak? What are the PPEs required during NiV outbreak investigation?

2. Write down the advantages and disadvantages of collection of data through   10.0
   questionnaire. Make a standard format of questionnaire for COVID-19 to gather necessary information.

3. Briefly describe the role of laboratory in emerging infectious diseases. Describe the   10.0
   operational framework of passive surveillance in the SAQTVH.

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Biostatistics (Practical)
Code: BIO-601
Full marks: 20, Time: 1 hour

(Figures in the right margin indicate full marks. Answer all questions from the following)

1. The following are the weights in kg of a random sample of 20 males affected with hypertension   10
at age of 55 to 65:

84.4	87.0	80.6	83.4	85.0
85.4	89.2	78.5	80.0	89.8
82.5	85.0	89.0	84.1	81.3
85.4	80.7	85.5	81.9	86.3

a. Estimate the mean.
b. 95% confidence interval (CI) of the mean was observed **82.86 and 85.63**. Interpret the CI.
c. Standard error (SE) of the sample mean was estimated as **0.70**. What is your interpretation of the results?
e. If we calculated a 99% CI using the data for 20 males would it be larger or smaller than that calculated in 'b'?

2. Calculate the sample size needed for the following conditions: 10
a. To estimate the prevalence of animal bite cases among the citizens of Chattogram city such that the error of estimation is within 5% of its actual parameter with 95% confidence and 15% expected prevalence?
b. To estimate the mean age of COVID-19 cases among the citizens of Chattogram city with the aim of 95% confidence and margin of error of 2 units. SD of the age in such population was retrieved from the literatures as 20 to 25.

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Biostatistics (Practical)
Code: BIO-601
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Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
July-December Semester Final Examination 2020
Course title: Health Economics, Policy Planning and Ethics (Practical)
Code: HEP-602
Full marks: 20, Time: 1 hour

(Figures in the right margin indicate full marks. Answer any 4 questions from the following. Each question contains equal mark (4X05))

1. If the market interest rate is 12 %, and the inflation rate is 4 %, calculate the real rate of interest. After calculating the real interest rate, fill in the empty cells of the following table and calculate the undiscounted and discounted benefit-cost ratio, and interpret your results.

Year	Discount factor	Undiscounted		Discounted	
		Cost	Benefit	Cost	Benefit
1		40	0		
2		22	50		
3		15	30		
4		0	15		
Total					

$$PV = 1/(1+r/100)^n$$

2. A person experienced heart failure at the age of 45. His life expectancy was 75 years. However, he will survive only 55 years due to heart failure. Due to this morbidity, he will have a disability adjustment for 10 years with a disability score of 0.5. If we treat the patient with a new heart failure treatment protocol, he will survive 65 years. In this case, he will have a disability adjustment for 8 years with a disability score 0.4. Calculate the DALYs aversion for the new treatment protocol.

3. 150 people are suffering from lumbar disk prolapse disease. There are three options available for treatment: bed rest, pain medication, and surgery. You are interested in spending 2,500$ for achieving per quality-adjusted life years. The table represents a hypothetical cost-utility analysis for this scenario. First, Fill in the empty cells of the following table. What treatment option do you think is suitable for this condition compared to bed rest? Interpret your result.

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Biostatistics (Theory)
Code: BIO-601
Full marks: 40, Time: 2 hours

(Figures in the right margin indicate full marks. Answer all questions from the following)

1. a. What are the tools of measures of middle and measures of spread? 3
   b. Differentiate standard deviation from standard error. 3
   c. Standard deviation (SD) of the weights of infants in a population was found **3.16**. How would 2
   you interpret the estimated SD?

2. a. What are the steps in a hypothesis testing? 3
   b. Mention the test of significance you would choose for the following association: 3
   i. COVID-19 status with gender ii. Body weight with age iii. Hemoglobin level with gender
   c. When would you choose Fisher's Exact test over χ^2 test? 2

3. a. Define target population and accessible population with examples. 2
   b. Classify sampling strategies. 2
   c. Suppose, you are a newly appointed doctor at a Upazila Hospital. During your first week of 4
   work, you came to know that cutaneous anthrax is one of the endemic problems in humans in
   that area. You make a plan to conduct a prevalence survey. Considering the above situation,
   answer the following:
   i. Formulate a suitable sampling technique to select 100 humans from the upazila to
   conduct the survey.

4. a. Classify variables. 2
   b. Classify the following variables: 3
   Age, sex, breed, educational status, class of study, hair color, body condition score, family size,
   number of cattle, hemoglobin level, economic status
   c. Mention which types of variables can be represented by the following graphs: 3
   Bar charts, histogram, pie chart, scatter plot

5. Write short notes on (any 2): 4X2
   i. Confidence Interval
   ii. P value
   iii. Null and alternative hypothesis
   iv. Arithmetic and geometric mean

Chittagong Veterinary and Animal Sciences University
One Health Institute
Masters in Public Health (MPH)
January-June Semester Final Examination 2021
Course title: Biostatistics (Theory)
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One Health Institute
Chattogram Veterinary and Animal Sciences University
Masters In Public Health (MPH)
January-June Semester Final Examination 2021
Subject: Food Safety and Risk Assessment (Theory)
Course Code: FRA-601

Full Marks: 40   **Time: 02 hours**

[Figures in the right margin indicate full marks. Answer four (4) questions. Split answers are discouraged.]

1. a) What is food contamination? Discuss about different food contaminants crucial to food safety. 04

   b) Discuss briefly about meat and fish safety. 06

2. a) Write in brief about Good Hygienic Practices (GHP). 06

   b) What do you mean by High Risk Food? Write down the common food associated with allergy. 04

3. a) What is HACCP? Write down its benefits along with its principles. 05

   b) Discuss about identification of hazard as a first stage of HACCP. 05

4. a) Define the following term: 02
      Control Measure, Critical Limit

   b) Write down the difference between Control Point (CP) and critical control Point (CCP). 03

   c) Draw the flow diagram of CCP recognition at different stages of food production. 05

5. Write a short note on the following: 3+3+4

   Cross contamination, Personal Hygiene, Food Pest

One Health Institute
Chattogram Veterinary and Animal Sciences University
Masters In Public Health (MPH)
January-June Semester Final Examination 2021
Subject: Food Safety and Risk Assessment (Theory)
Course Code: FRA-601

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