THE UNIVERSITY OF THE WEST INDIES
FIVE ISLANDS CAMPUS

Semester II

Examinations of April/May 2023

Course Code: NURS1113

Course Title: Epidemiology

Date of Assessment: May 04, 2023

Time: 9:00 am

Duration: Two (2) Hours

INSTRUCTIONS TO CANDIDATES:

This paper has _8_ pages and _5__ questions.

YOU ARE REQUIRED TO ANSWER ___All__ QUESTIONS.

THIS ASSESSMENT IS WORTH ___60__ % OF YOUR FINAL GRADE.

ASSESSMENT DETAILS FROM INSTRUCTOR(S):

Complete all questions in this paper. Details of all calculations must be shown.

1. During active surveillance in the Bird Island Community Clinic, the Nursing Coordinator documented 20 suspected cases of measles within 72 hours.

   a. Outline the chain of infection for this illness by identifying the reservoir(s), portal(s) of exit, mode(s) of transmission, the portal(s) of entry, and two factors of the infectious agent that contribute to disease development. (6 marks)

   Infectious agent:

   Reservoir(s):

   Portal(s) of exit:

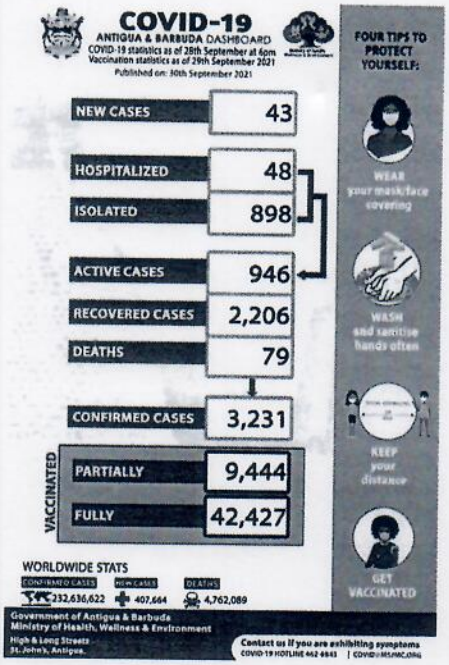
   Mode(s) of transmission:

   Portal(s) of entry:

   Factors of infectious agent that contribute to disease development:

   b. As a healthcare provider working at the local hospital, outline two ways in which you can protect yourself from acquiring an infection caused by the measles virus. (6 marks)

2. Use the dashboard below to answer the following questions.



The population of Antigua and Barbuda is 93,219 (2021 estimate). Use per 10,000.

a. What was the incidence rate for COVID-19 disease in the population? (2 marks)

b. What was the prevalence of disease in Antigua and Barbuda on 30th September 2021? (3 marks)

c. Calculate the prevalence of COVID-19 in Antigua and Barbuda from the start of the pandemic in 2020 to the 30th of September 2021. (3 marks)

3. For each of the following activities, state whether it is primary, secondary or tertiary prevention, giving a brief reason for your answers (10 marks)

a. Hepatitis immunisation.

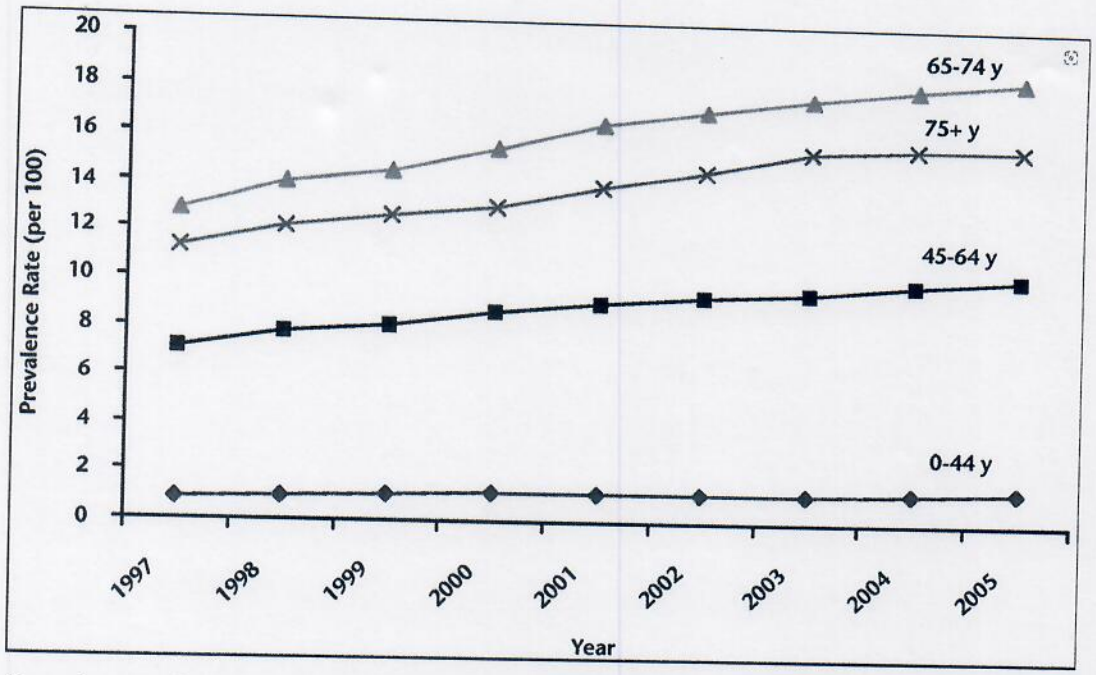
b. Use of bed nets impregnated with insecticide in malaria-endemic areas.

c. Annual mammography to the population of women aged 50–64 for early detection of breast cancer.

d. Smoking-cessation programme in middle-aged men recovering from a heart attack.

e. Programme of terminal care for a patient with cancer.

4. a. Interpret the graph below. (5 marks)



Prevalence of diagnosed diabetes by age in the United States. National Health Interview Survey, 1997–2005. Source: Epidemiology of Diabetes and Diabetes-Related Complications | Physical Therapy | Oxford Academic (oup.com)

b. Comment on the data in the table below. (5 marks)

TABLE 16.7 Incidence of Multiple Sclerosis (MS) per 100,000 Among European, African, and Asian Immigrants to Israel by Age at Immigration

	INCIDENCE OF MS IN MIGRANTS	
Age at Immigration	European	African and Asian
<15 years	0.76	0.65
15–29 years	3.54	0.40
30–34 years	1.35	0.26

Modified from Alter M, Leibowitz U, Speer J. Risk of multiple sclerosis related to age at immigration to Israel. *Arch Neurol.* 1966;15:234–237.

5. Use the excerpt below to answer the following questions.

BACKGROUND

In adults with active lupus nephritis, the efficacy and safety of intravenous belimumab as compared with placebo, when added to standard therapy (mycophenolate mofetil or cyclophosphamide–azathioprine), are unknown.

Patients were randomly assigned in a 1:1 ratio with the use of an interactive Web-response system at day 1 (the baseline visit) to receive intravenous belimumab (at a dose of 10 mg per kilogram of body weight) or matching placebo. Randomization was stratified according to induction regimen (cyclophosphamide or mycophenolate mofetil) and race group (Black or non-Black). The trial agents were prepared by pharmacists who were aware of the trial-group assignments. Patients and staff were unaware of the trial-group assignments, although independent monitors were aware of these assignments.

In addition to standard therapy, patients received intravenous belimumab or placebo on days 1 (baseline), 15, and 29 and every 28 days thereafter to week 100, with final assessments at week 104. Standard induction therapy, chosen by the investigators and initiated within 60 days before day 1, consisted of intravenous cyclophosphamide (500 mg every 2 weeks [±3 days] for 6 infusions) or mycophenolate mofetil (target dose, 3 g per day). In patients receiving cyclophosphamide–azathioprine, maintenance therapy (target dose, 2 mg per kilogram per day; ≤200 mg per day) until trial end was initiated 2 weeks after the last dose of cyclophosphamide. For mycophenolate mofetil induction, maintenance therapy consisted of mycophenolate mofetil at a dose of 1 to 3 g per day until the end of the trial, although after 6 months, the dose could be reduced to 1 g per day. At the investigator's discretion, high-dose glucocorticoids (1 to 3 intravenous pulses of methylprednisolone [500 to 1000 mg each]) could be administered during induction, followed by oral prednisone (0.5 to 1.0 mg per kilogram per day; total daily dose, ≤60 mg). Treatment regimens were based on those in the Euro-Lupus Nephritis Trial and the Aspreva Lupus Management Study.[14-17] Receipt of angiotensin-converting–enzyme (ACE) inhibitors or angiotensin-receptor blockers (ARBs) as well as hydroxychloroquine was recommended in the trial protocol.

Source: Two-Year, Randomized, Controlled Trial of Belimumab in Lupus Nephritis | NEJM

a. List the PICO components of the study. (4 marks)

Population-

Intervention

Comparator

Outcome

b. State two key characteristics of the study and identify the study design. (6 marks)

c. List two observational study designs used in epidemiology. (4 marks)

d. Describe two characteristics that can be used to differentiate between observational analytical studies? (6 marks)

Formula Sheet

$$P = \frac{\text{Number of people with the disease or condition at a specified time}}{\text{Number of people in the population at risk at the specified time}} (\times 10^n)$$

$$I = \frac{\text{Number of new events in a specified period}}{\text{Number of persons exposed to risk during this period}} (\times 10^n)$$

$$\textit{Crude mortality rate} = \frac{\text{Number of deaths during a specified period}}{\text{Number of persons at risk of dying during the same period}} (\times 10^n)$$

$$\textit{Case fatality}\,(\%) = \frac{\text{Number of deaths from diagnosed cases in a given period}}{\text{Number of diagnosed cases of the disease in the same period}} \times 100$$

$$\textit{Infant mortality rate} = \frac{\text{Number of deaths in a year of children less than 1 year of age}}{\text{Number of live births in the same year}} \times 1000$$

END OF QUESTION PAPER