**AFRICA INSTITUTE FOR PROJECT MANAGEMENT STUDIES**

**DIPLOMA IN PUBLIC HEALTH**

**ASSIGNMENT**

**BY**

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1**. Distinguish between descriptive epidemiology and analytical epidemiology**

Descriptive Epidemiology strives to explain comprehensiveness in characterizing an epidemiologic event, whether it is a pandemic of influenza or a local increase in all-terrain vehicle crashes. However, Descriptive epidemiology covers time, place, and person. Compiling and analyzing data by time, place, and person is desirable for several reasons.

* First, by looking at the data carefully, the epidemiologist becomes very familiar with the data. He or she can see what the data can or cannot reveal based on the variables available, its limitations (for example, the number of records with missing information for each important variable), and its eccentricities (for example, all cases range in age, months.
* Second, the epidemiologist learns the extent and pattern of the public health problem being investigated — which months, which neighborhoods, and which groups of people have the most and least cases.
* Third, the epidemiologist creates a detailed description of the health of a population that can be easily communicated with tables, graphs, and maps.
* Fourth, the epidemiologist can identify areas or groups within the population that have high rates of disease. This information in turn provides important clues to the causes of the disease, and these clues can be turned into testable hypotheses.

Analytic Epidemiology: As we have learnt that descriptive epidemiology can identify patterns among cases and in populations by time, place and person. From these observations, epidemiologists develop hypotheses about the causes of these patterns and about the factors that increase risk of disease. In other words, epidemiologists can use descriptive epidemiology to generate hypotheses, but only rarely to test those hypotheses. For that, epidemiologists must turn to analytic epidemiology. Epidemiologists use analytic epidemiology to quantify the association between exposures and outcomes and to test hypotheses about causal relationships. It has been said that epidemiology by itself can never prove that a particular exposure caused a particular outcome. Often, however, epidemiology provides sufficient evidence to take appropriate control and prevention measures.

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

(i) **Incidence**

*Number of cases among contacts of primary cases x 10 n Total number of contacts*

(ii) **Prevalence**

P=Incidence rate \*Average duration of a disease

P/(1-P)=IR\*AVG

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

The following are the main four epidemiological research designs:

1. **Observational studies**

In an observational study, the epidemiologist simply observes the exposure and disease status of each study participant.

1. **Cohort study*.***

A cohort study is similar in concept to the experimental study. In a cohort study the epidemiologist records whether each study participant is exposed or not, and then tracks the participants to see if they develop the disease of interest. Note that this differs from an experimental study because, in a cohort study, the investigator observes rather than determines the participants’ exposure status. After a period of time, the investigator compares the disease rate in the exposed group with the disease rate in the unexposed group. The unexposed group serves as the comparison group, providing an estimate of the baseline or expected amount of disease occurrence in the community. If the disease rate is substantively different in the exposed group compared to the unexposed group, the exposure is said to be associated with illness. The length of follow-up varies considerably. In an attempt to respond quickly to a public health concern such as an outbreak, public health departments tend to conduct relatively brief studies.

1. **Case-control study**.

In a case-control study, investigators starts by enrolling a group of people with disease such persons are called case-patients rather than cases, because case refers to occurrence of disease, not a person. As a comparison group, the investigator then enrolls a group of people without disease (controls). Investigators then compare previous exposures between the two groups. The control group provides an estimate of the baseline or expected amount of exposure in that population. If the amount of exposure among the case group is substantially higher than the amount you would expect based on the control group, then illness is said to be associated with that exposure.

1. **Cross-sectional study***.*

In this third type of observational study, a sample of persons from a population is enrolled and their exposures and health outcomes are measured simultaneously. The cross-sectional study tends to assess the presence (prevalence) of the health outcome at that point of time without regard to duration. For example, in a cross -sectional study of diabetes, some of the enrollees with diabetes may have lived with their diabetes for many years; while others may have been recently diagnosed. From an analytic viewpoint the cross -sectional study is weaker than either a cohort or a case control study because a cross-sectional study usually cannot disentangle risk factors for occurrence of disease (incidence) from risk factors for survival with the disease.

1. **Data from hospital records are one of the most important sources of information in epidemiologic studies.** 
   1. **Outline the limitations of using hospital data**.

**Underreportin**g.

For the majority of modifiable diseases, data for surveillance are based on passive reporting by physicians and other health-care providers. Studies have demonstrated that in the majority of jurisdictions, only a fraction of cases of the modifiable diseases overall are ever reported. The most obvious result of such underreporting is that effective action is delayed, and cases occur that might have been prevented by prompt reporting and prompt initiation of control measures. For example, if a case of hepatitis A in a food handler goes unreported, the opportunity to provide protective immune globulin to restaurant patrons will be missed, and cases or an outbreak of hepatitis A that should have been prevented will instead occur. However, underreported data might still be useful for assessing trends or other patterns reflecting the occurrence or burden of disease.

Public health agencies must recognize these barriers to reporting, because the majority is within an agency's power to address or correct:

Lack of knowledge of reporting requirements:

• Lack of awareness of responsibility to report.

• Lack of awareness of which diseases must be reported.

• Lack of awareness of how or to whom to report.

• Assumption that someone else (e.g., the laboratory) will report

**Lack of representativeness of reported cases**.

Underreporting is not uniform or random. Two important biases distort the completeness of reporting. First, health-care providers are more likely to report a case that results in severe illness and hospitalization than a mild case, even though a person with mild illness might be more likely to transmit infection to others because the person might not be confined at home or in the hospital. This bias results in an inflated estimate of disease severity in such measures as the death-to-case ratio. Second, health-care providers are more likely to report cases when the disease is receiving media attention. This bias results in an underestimate of the baseline incidence of disease after media attention wanes. Early reports indicated a death-to-case ratio much higher than the ratio determined by subsequent studies, and reported cases declined more than incident cases after the publicity waned.

**Lack of timeliness.**

Lack of timeliness can occur at almost any step in the collection, analysis, and dissemination of data on notifiable diseases. The reasons for the delays vary. Certain delays are disease-dependent. For example, physicians cannot diagnose certain diseases until confirmatory laboratory and other tests have been completed. Certain delays are caused by cumbersome or inefficient reporting procedures. Delays in analysis are common when surveillance is believed to be a rote function rather than as one that provides information for action. Finally, delays at any step might culminate in delays in dissemination, with the result that the medical and public health communities do not have the information they need to take.

* 1. **Describe the possible sources of error in interview surveys**

**Non -response error**

Non responsive error in surveys arises from the inability to obtain a useful response to all survey items from the entire example. A critical concern is when that non responsive leads to biased estimates. Non responsive biased is a product of the difference between respondents and no respondent on a particular measures and the size of the non responsive populations. A lower response rate increases the potential for greater non responsive bias, but when the data are missing at random, a lower response rate will either create or increase non responsive error.

They include maintaining adequate response from increasingly busy and reluctant respondents. More and more households are non English speaking, and growing number of higher income households have controlled –access residences. Today household’s surveys face confidentiality and privacy concerns, public growing more suspicious of its government surveys vying for the public attentions.

For any surveys, its intended purpose and concept must be clearly defined in order for survey instruments and procedures to accurately translate those concepts into the collection of data. In surveys, specification error may occur when there is a mismatch between what the survey is measuring and what it is intended to measure. Specification error pertains specifically to the problem of measuring the concept in survey, rather than measuring the right concept poorly.

**Measurement error**

Measurement error includes a large family of error that may occur when response on a survey results in the collection of inaccurate or incomplete information. In this section, the report discusses potential measurement error on the national crime victimization survey associated with the respondent, the questionnaire, the mode of collection, and with the interview/respondent interaction. These issues are interrelated and each has the potential to the result in measurement error.

**Data collection modes and methods**

Data collection mode can have important consequences for total survey quality. The mode affects the context of a survey. It affects questionnaire construction, the amount and the type of communication with the respondents, and the completion rate, among others. Considerable surveys research regarding mode effects in survey has three mode groups did not differ in response rates, but the mode of data collection did affects the level of reporting of sensitive behaviors both forms of sels-administration tended to reduce the disparity between men and women in the number of sex partners reported. Self –administration.

Thus a choice of data collection mode is very important when dealing with sensitive questions. A question may involve a potential socially undesirable response. If an interviewer is asking the question, hearing the answer, and perhaps probing for more information, then the respondent may be concerned about the interviewers’ approval or disapproval. Thus, a self –administered mode of collection generally provides respondents with less motivation to misreport on sensitive questions.

Findings on mode difference in reporting of sensitive information clearly point a finger at the interviewer as a contributor to misreporting. It is nit that the interviewer does anything wrong. What seems to make the difference is whether the respondent has to report his or her answers to another person.

**Privacy**

The research findings on survey mode and asking sensitive questions raise a major concern with the current methods of data collection on the NCVS for measuring rape and sexual assaults.

If no household emphasis added members are present, either in a sample housing unit or group quarters, ask the respondent if he/she wishes to be interviewed in private .If so make the necessary arrangements to either interview the person elsewhere or at different time. Some respondent may prefer not to be interviewed while other household members are present. Always respect the respondent need for a private interview.

Thus the interview manual indicates that some respondents may prefer a private interview but does not direct the field representative to ask unless no household members are present.

The panel believes that privacy in interviewing about sexual violence is critical because most rapes and sexual assaults are committed by individuals whom the victim’s knows. The offender may, in fact, be member of the household. Another possibility is that a teenager has been a victim of date rape but has not told his or her parents. A respondent who has been sexually victimized may not report the victimization if that reporting may be overheard or otherwise inferred by another household member. This concern goes beyond whether there is another household member in the same room during the interview, to the situation in which the interview can be overheard from another room in the home, to the situation in which another household member may notice that the victims interview lasted longer than the one in which he or she participated.

Responding to sensitive questions is dependent on whether the bystander already knows the information.

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

Health determinant are the range of social, ecological, political, commercial and cultural factors that influence health status are known as the determinants of health. These are often complex and interrelating factors that contribute to a person’s current state of health and their chances of maintaining good health or becoming ill or injured. Circumstances are shaped by the distribution of money, power, and resources at the international, domestic and local level.1

The determinants of health are occasionally referred to as ‘the causes of the causes’, as we recognize

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**Social Determinants of Health**

The social determinants of health (SDH) are the conditions in which people are born, grow, live, work and age and the systems in place that affect a wide range of health, functioning, and quality of life outcomes and risks. These set of forces and systems shape the conditions of daily life, and are responsible for health inequities – the unfair and avoidable differences in health status seen within and between countries.3 Health inequities are not only shaped by unequal distribution of resources, but can include social isolation and the sense of control over life circumstances and choices. People need to feel that they have a certain level of control over their lives, jobs, housing and environment, and other resources that enhance quality of life, as these can have a significant influence on population health outcomes.

The World Health Organization (WHO) explains that these social and economic conditions, and their effects on people’s lives, determine our risk of illness; the actions we can take to prevent ourselves becoming ill; and our ability to treat illness when it occurs. In 2003, WHO identified the 10 key social determinants of health:

The social gradient

Stress

Early life

Social exclusion

Work

Unemployment

Social support

Addiction

Food

Transportation4

**Ecological Determinants of Health**

There are many ecological processes and natural resources that are essential for the health and wellbeing of individuals and communities. The view that humans are fundamentally more important than other forms of life ignores the reality that human survival depends on the diversity of other life forms, which are in turn interdependent themselves.

The ecological determinants of health can include adequate amounts of fresh and uncontaminated water and oxygen as well as access to nature or green space. Other important determinants are ecological processes and natural resources such as fertile soil to grow food and other plants, materials to construct shelter, a stable climate with temperatures conducive to sustaining life and the ozone layer to protect the Earth from harmful levels of UV radiation.

We recognize that home environment, built environment, access to nature and the ecological environment all play a role in maintaining human health and well-being, and we need to take into account how our decisions and actions affect these ecosystems. Climate change will have a major impact on the health and wellbeing of populations into the future, especially those who are marginalized or part of vulnerable groups.

**Political Determinants of Health**

Many of the determinants of health are dependent on the action of local, national and international laws and legislation. The importance of policy and the orientation of politics in the health outcomes of populations have gained attention as an important factor in mainstream public health. Looking at health via the political determinants means analyzing how competing power groups, institutions, processes, interests and ideological positions affect health within different political systems and cultures and at differing levels of governance.

Politically progressive governments will generally endorse progressive policies which aim to reduce the impact of social inequalities on health. The political arena can be used to promote and protect a well-functioning ecosystem, healthy and sustainable lifestyles through the control of tobacco and alcohol use, improving access and funding to health services or to tackle health inequalities. Political outputs include the laws, taxes, social security benefits, public services, etc. that will ultimately produce the health and other societal outcomes of interest.7

**Commercial Determinants of Health**

The commercial determinants are closely linked with the political determinants of health and can be defined as the strategies and approaches used by the private sector to promote products and choices that are detrimental to health. These strategies include marketing practices, which can enhance the attraction and acceptability of unhealthy products and commodities; lobbying, which can impede political obstacles such as plain packaging and legal drinking ages; corporate social responsibility strategies, which can deflect attention and re-establish reputations; and extensive supply chains which amplify company influence worldwide.

**Cultural Determinants of Health**

The cultural determinants of health incorporate the cultural factors that promote resilience, foster a sense of identity and support good mental and physical health and wellbeing for individuals, families and communities. Cultural determinants are shaped, supported and protected through traditional cultural practice, kinship, connection to land and Country, art, song and ceremony, dance, healing, spirituality, empowerment, ancestry, belonging and self-determination. These determinants have a strengths based perspective, acknowledging that stronger connections to culture and Country promotes and leads to stronger health and wellbeing and improved outcomes across the other determinants of health.