Research Paper

You’re Name (First M. Last)

School or Institution Name (University at Place or Town, State)

Research Paper

**Introduction**

Profession in epidemiology is recruitment in basic medical sciences that is similar to biochemistry, anatomy, and physiology, studied by almost all medical students. Epidemiology is associated explicitly with finding causes to sickness and the reason why a specific population is healthier than other. Epidemiologists have to take into account a particular population where they would be describing the occurrence of a particular disease. (Rothman, 2008).

**Goals of the field of Epidemiology**

Epidemiology is one of the broader field of specialization in healthcare, taking into account that it will cover core competencies of public health that would be used to collect medical data accompanied by detailed research and analysis. This evaluation could determine the application of an observation in real-life context. Climate, health, biostatistics, and social determinants of health are some prime goals of the field of epidemiology that can help to paint an accurate picture of any health problem. (Rees et al., 2016). Epidemiological studies are used to determine the frequency of particular health problem, along with the identification of potential causes and the risk factors associated with a particular health issue along with the evaluation of efficacy in the preventative measures and the treatments. After the collection of this information, epidemiology is used to create certain strategies that could prevent a particular health condition and implement better policies so as to preserve public health. It is significant to note that epidemiology has a prime goal to influence public health agencies, medical organizations, and other government institutes so as to promote positive health outcomes. (Senkomago, et al., 2018). The goal of epidemiology is not confined to collection of information; in fact, it is also concerned with the practical implication of the found strategies in order to bring positive changes in the healthcare system. Moreover, another significant goal is to improve research methodologies so that better research could be conducted to ensure healthy lives. (Rees, et al., 2016).

**Approaches used by epidemiologists**

There are a number of approaches that are used by epidemiologists in order to carry out observation and bring about required changes. It is important to note that the modern term approaches have been chosen to describe different methods that can then be utilized by epidemiologist to study the epidemiology of healthcare.

**Measurement of performance**

Measurement of performance is also termed as an experiential study that can be used to determine causal relation between the variables of an experiment. It would not be wrong to say that the measurement of performance is used to know the workability of findings and determine the difference between manual and non-manual readings so as to achieve a conclusion. (Dankner, et al., 2018)

**Capacity of performance**

It refers to the analysis of efficiency of performance. Studies that are based on potential or the capacity of performance are further divided into two major types. One of the types is involved and included in the physical fitness while other is concerned with the analysis of intelligence. It is important to note that the study associated with intelligence is few steps moved from the actual performance. In contrast to the intelligence and physical test is the study that is meant for the analysis of growth and development that provides a relatively indirect indication of the potential of performance (Dankner, et al., 2018).

**Measurement of impediments of performance**

It refers to the analysis of the facts and figures that can help to sort out the impediments that may affect the performance of observation or other hindrances.

However, in general, there are two basic approaches that are used by epidemiologist such as, asking questions and making compassion. Asking questions is related to the descriptive analysis that is further used to determine, who what and when relationships (Senkomago, et al., 2018). However making comparison can be used to define any comparison between two different populations such as rural and urban, male and female and seasons. Different tools are used in order to implement these approaches, such as case counts rates, ratios, and proportions. These approaches are used to undergo epidemiology that involves an implication of systematic procedures that can be used to collect data about something and implement changes that can bring positive health results (Dankner, et al., 2018).

**Epidemiological surveillance**

Epidemiological surveillance is a systematic procedure that involves the collection, analysis, and the interpretation of data that is related to health. The collected data is then used for the planning, sequential implementation, and evaluation of any public health practice. Surveillance is a basic code that shares information regarding descriptive epidemiology. (Senkomago, et al., 2018). It includes the description of a person, defining identity, place, and whereabouts. Time deals with days, months, hours, and minutes. Epidemiologists get surveillance data from different sources such as, vital past records, certain environment monitoring system, surveys, and other animal health data.

**Descriptive and analytical epidemiology**

**Descriptive Epidemiology**

Descriptive epidemiology deals with the characterization of who when where or when questions. Here a person is characterized in terms of age, occupation, and sex, and how these characteristics are affected by a particular outcome. Place refers to the description of geography involving the description of work, residence, and hospital of the individual who is affected. Time deals with the occurrence of different events, taking into account the time of diagnosis, reporting, and testing (Dankner, et al., 2018).

There are two different types of descriptive studies; it can either be aggregate or individual. Aggregate studies are concerned with ecological studies, while individual studies deal with three different studies. They are named as, case report, case series, and cross-sectional studies.

**Analytical Epidemiology**

Analytical epidemiology deal with the testing of hypothesis about the relationship between exposure and outcome. It refers to the measurement of association between exposure and outcomes. This study is facilitated by a comparison group. There are two different types of analytical studies, experimental studies, and observational studies. Experimental studies are carried out by randomized control. Observational studies are further divided into the cohort, case-control, and cross-sectional studies (Dankner, et al., 2018).

**Examples of epidemiology in promoting public health**

Epidemiology can also be used to enhance public health, taking into account the use of certain techniques. It is found that epidemiologists use different methods of disease surveillance, outbreak investigation, and other observational studies to identify certain risk factors of zoonotic disease in both animals as well as the human population. The knowledge and information collected about risk factors are then utilized to carry out detailed investigation and implementation of disease control measures. In this case, epidemiological methods are used for the analysis and identification of major hazards so that critical control points can be incorporated in the food production system (Senkomago, et al., 2018).

Epidemiological studies can be used to find out the relationship between lung cancer and smoking on the basis of comparison between smokers and nonsmokers. The study would not be meant to determine the simple relationship that smoking cause’s lung cancer, in fact, epidemiology would be used to expose animals to smoke and tobacco. Then a comparison would be made between the smoking and the increased risk of cancer (Senkomago, et al., 2018).

Epidemiology is also used for the collection of relevant data. For example, if lung cancer is a common disease, epidemiologist would use tools that could help them collect statistical data that can be used to elucidate the relevancy and relationship of exposure to a health outcome. In a nutshell, epidemiology would be used to discover a causal relationship between exposure to the risk factors and the actual outcome. Moreover, epidemiology could be used to gather data at a broad range of psychosocial and biomedical ways that could be used for testing theoretical hypothesis and make meaningful assertions (Senkomago et al., 2018).

**Educational preparations required for a career in epidemiology**

In order to become a proper and practicing epidemiologist, individuals have to go through intense years of studying and educational preparation. This educational preparation helps them in performing their duties for the public and also private institutions that provide health services. Furthermore, their expertise is also required in pharmaceutical businesses, government agencies, universities, and laboratories. For the most advanced level of jobs in this requires a higher level of education and multiple years of working in the field (Senkomago, et al., 2018). Most individuals that are working as epidemiologists hold a master's degree in either public health or epidemiology. Research associated or senior-level jobs require a Doctor of Philosophy in epidemiology or a Ph.D. All in all, there are three levels that an individual needs to pass in order to have the full educational preparation for a career in epidemiology.

The primary level is the Bachelor's Degree, which candidates aspiring to be epidemiologists need to conquer first. In this degree, it is not specified to choose a major, but undergraduate course providers should give classes to students in subjects such as biology, calculus, chemistry, health science, behavioral science, and social science. The second level of educational preparation is the Master's Degree. For a career in epidemiology, the minimum education requirement is a master's degree in either epidemiology or public health. In this level of education, topics such as epidemiological research biostatistics and clinical trial design are covered (Dankner, et al., 2018). In order to pass and attain a Master's degree, a thesis is required, which can be focused on either neuroepidemiology, cardiovascular, genetic epidemiology, or cancer. Other epidemiological programs focus more on options, including clinical research, for example, on pharmacy, dentistry, or medicine. Whereas, some of the courses offered are only offered to medical doctors or students.

The last level is the Doctoral Degree, which is mostly required when epidemiologists want to further their careers to reach research positions at a higher level or even for teaching jobs at universities (Rees et al., 2016). Graduation requires independent research which has to be original, and a dissertation is also required. Some of these doctoral programs are flexible enough that they are even able to meet the interests of their students.

References

Dankner, R., Gabbay, U., Leibovici, L., Sadeh, M., & Sadetzki, S. (2018). Implementation of a competency-based medical education approach in public health and epidemiology training of medical students. Israel Journal of health policy research, 7(1), 13.

Rees, E. L., Gay, S. P., & McKinley, R. K. (2016). The epidemiology of teaching and training general practices in England. Education for Primary Care, 27(6), 462-470.

Rothman, K. J., Greenland, S., & Lash, T. L. (2008). *Modern epidemiology* (Vol. 3). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins.

Senkomago, V., Joseph, R., Sierra, M., Van Dyne, E., Endeshaw, M., Duran, D., ... & Saraiya, M. (2018). CDC activities to enhance training in cancer prevention and control in field epidemiology training programs in low-and middle-income countries. Journal of global oncology, 4, 1-9.