

Difference Between Descriptive and Analytic Epidemiology

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Key Difference - Descriptive vs Analytic Epidemiology

The field Epidemiology refers to the study of the distribution and determinants of health-related states or events in a specified population. It is widely applied in the control of health problems worldwide. Epidemiologic studies are conducted on health problems in order to determine the causes of a disease and to find the effectiveness of possible interventions on the disease. The Epidemiology can be divided into two broad classes; Descriptive Epidemiology and Analytic Epidemiology. Descriptive Epidemiology refers to the studies that generate hypotheses and answer the questions who, what, when and where of the disease or [infection](#). Analytic Epidemiology refers to the studies which are conducted to test for hypotheses and to generate conclusions on the particular disease. The **key difference** between Descriptive and Analytic Epidemiology is the approach taken to address the particular health issue. **Descriptive Epidemiology generates hypotheses whereas Analytic Epidemiology test for hypotheses to deduce conclusions.**

What is Descriptive Epidemiology?

Descriptive Epidemiology refers to the place, time, and the person involved in the onset of the disease. The 5Ws of Descriptive Epidemiology includes What, How, Where, When and Why. In the scientific language, these are referred to as the case definition, person, place, time, and causes/risk factors/modes of transmission of disease. In Descriptive Epidemiology, the hypothesis is generated by studying the background of the disease.

The three main aspects studied in Descriptive Epidemiology are the place, time and person involved in the disease. The time of a disease onset depends greatly on the climate, seasons and different extreme environment conditions. Therefore, the occurrence of the disease is unpredictable and can change over time. The outbreak of certain diseases takes place simultaneously that can lead to [epidemic conditions](#). Depending upon the trends of weather and climate, epidemiologists can predict the onset of different infections and diseases.

The place of the disease onset is also an important factor of Descriptive Epidemiology. The spread of diseases can be predicted by studying the location of the disease worldwide. Certain infections are prevalent only in some parts of the world, whereas some infections are limited only to a particular area or country.

The 'person factor' of Descriptive Epidemiology can be elaborated in different aspects. The person may use inherent characteristics, immune characteristics, acquired characteristics, activities and different conditions of the individual or the disease. Therefore, different study

types are involved in Descriptive epidemiology. They include Case reports, case-control studies, incidence studies, cross-sectional studies and ecologic studies.

What is Analytic Epidemiology?

Analytic Epidemiology is mainly concerned with finding the causes of the infection or the disease to identify the interventions of the disease. Analytic Epidemiological studies are mainly categorized as experimental and observational studies. Analytic epidemiology studies are conducted to obtain a relationship between different exposures to the disease condition and to obtain its outcome in a measurable manner. Analytic epidemiology incorporates a comparison group in its study designs.

Experimental studies involve laboratory experimentation in *in vitro* conditions and in *in vivo* conditions. In this type of studies, a laboratory trial is carried out based on a hypothesis decided by the epidemiologist. The experimental studied can either be clinical trials or community trials. During experimental studies, different interventions are made to analyze the disease behaviour.

In observational studies, the data is derived mainly based on questionnaires on a selected population or a cohort. These studies can be either retrospective or prospective depending on the study design. Statistical analysis is mostly done on analytic epidemiological studies to deduce conclusions. They are expressed as odds ratios, confidence levels and risk ratios.

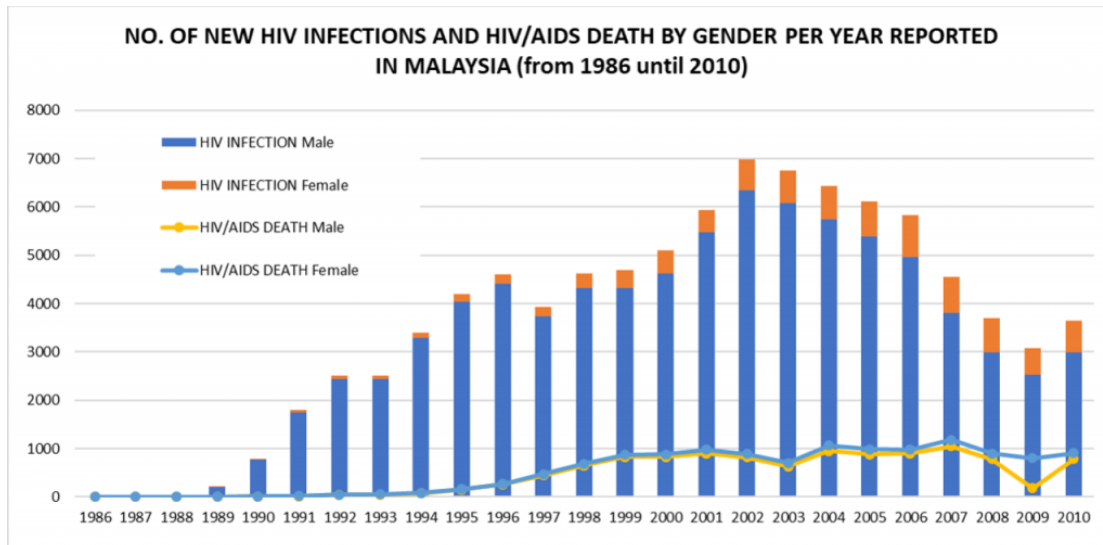


Figure 01: A bar chart depicting the HIV infections and Aids deaths in Malaysia

Analytic epidemiology is important in deriving conclusions on a particular disease state or an infection to confirm the hypothesis tested whether it can be accepted or it is rejected.

What are the Similarities Between Descriptive and Analytic Epidemiology?

- Both study types are based on a hypothesis developed for a particular disease condition.
- Both study types are involved in expanding the disease biology.
- Both study types involve expert knowledge of epidemiologist specialized in different fields.

What is the Difference Between Descriptive and Analytic Epidemiology?

Descriptive vs Analytical Epidemiology	
Descriptive Epidemiology refers to the studies that generate hypotheses and answer the questions who, what, when and where of the disease or infection.	Analytic Epidemiology refers to the studies that are conducted to test for hypotheses and to generate conclusions on the particular disease.
Hypothesis	
Descriptive epidemiology is able to generate a hypothesis.	Analytic epidemiology is able to conduct a test for the hypothesis.
Interventions	
Intervention studies are not performed in descriptive epidemiology.	Interventions are analyzed in analytic epidemiology.

Summary - Descriptive vs Analytic Epidemiology

Descriptive and Analytic Epidemiology are the two main branches of epidemiology which define disease or an infection and its various aspects. Descriptive epidemiology deals with the basic data pertaining to the disease. It studies the time, place and person involved in the disease. Analytic epidemiology deals in finding causes for the particular condition by conducting experiments. It is important in measuring the outcomes of intervention and to prove or disapprove the hypothesis. This is the difference between descriptive and analytic epidemiology.

Reference:

1. "Lesson 1: Introduction to Epidemiology." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 18 May 2012. [Available here](#)
2. "Introduction." Descriptive Epidemiology. [Available here](#)

Image Courtesy:

1.'NO. OF NEW HIV INFECTIONS AND AIDS DEATHS BY GENDER PER YEAR REPORTED IN MALAYSIA (from 1986 until 2010)'By Benjy8769 - Own work, [\(CC BY-SA 4.0\)](#) via [Commons Wikimedia](#)

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APA: Difference Between Descriptive and Analytic Epidemiology.(2018 February 06). Retrieved (date), from <http://differencebetween.com/difference-between-descriptive-and-vs-analytic-epidemiology/>

MLA: "Difference Between Descriptive and Analytic Epidemiology" Difference Between.Com. 06 February 2018. Web.

Chicago: "Difference Between Descriptive and Analytic Epidemiology." Difference Between.Com. <http://differencebetween.com/difference-between-descriptive-and-vs-analytic-epidemiology/> accessed (accessed [date]).



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