Spread of Human Diseases

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Introduction

The disease is an illness that spreads from one person to another. They are also known as the infectious, communicable and the contagious disease. These diseases are caused by tiny bugs or bacteria, virus and germs. These organisms are very small so that they are only visible by the help of a microscope but they cannot be seen with a naked eye. These bugs and germs includes bacteria, virus, fungi and parasites. The viruses can cause HIV, hepatitis A and B, colds and chicken pox. The fungi include thrush and ringworms. In the same way, parasites include scabies, head lice, pin worms and giardia. The condition of illness that is caused by parasites, bacteria and fungi requires treatment from antibiotics and the medical assessment.

Many of the diseases that are caused by viruses become mild and they go away on their own but some diseases need treatment and medical evaluation. There are a few diseases and conditions of health that are not communicable and they cannot be spread from each person to another. The examples of these diseases include allergy, asthma, blindness and cerebral palsy. This essay aims to discuss spreading of disease. In addition, the models that are used to help the tracking of diseases and inform the control of diseases and mitigation (Lupton, 2012).

Discussion

The organisms that result in causing the communicable or infectious diseases are present among people, food, animals, air, water and dirt. Many of the organisms that are present in the body fluids of human beings like in saliva, vomit, mucus, urine, stool and skin lesions. Some of the communicable bugs are also carried out on hairs and the skin. The organisms are spread

when the fluids of an individual person come out and get inside the body of another person. These diseases can also be identified on the basis of transmission mode. They include respiratory diseases, gastrointestinal diseases, dermatologic diseases, and the blood borne diseases. The respiratory diseases mainly affect chest and head. They are spread by sneezing, breathing and coughing. The gastrointestinal diseases affect the intestines and stomach of an individual. They are usually spread by vomit, touch, and the contaminated surfaces. The dermatologic diseases are those that affect skin and hair. They can be caused by sharing of towels, and hair brushes. The blood borne diseases are those that affect the overall body of an individual. They are usually spread by receiving the blood transfusions, tattoos, piercing and after having sexual contact (Nelson and Williams, 2013).

Transmission of Disease

The transmission of a contagious disease takes place by various methods. The transmission of a disease can be modelled and there are certain factors that are required in modelling. These factors include duration of latent and infectious period. The number of contacts that a diseases unit make with each unit of time and in the complete period of infection. The number of contacts that can lead to cause the infection of a susceptible unit and the number of effective contacts. When the number of effective contacts that is created by the infected units can be used to quantify the transfer of susceptible people into infected people. This is identified to be a highly important concept in the modelling of diseases. The average number of contacts by the help of an infected unit will be the number of secondary infections which is expected when the primary infection case is introduced among the susceptible population. This is known as the basic reproductive ratio or the reproductive rate (Bojd et al. 2015).

The effective contacts concept can be utilized in order to calculate the risk of infection among the susceptible units that are present in a model. These units are proportional to the number of infectious units. The models must be considering the situation that the epidemic progress, contacts, portion of susceptible falls and contacts are being wasted on the already infected units. This facilitates in natural reduction in epidemics among the undistributed population. Therefore, along with an increase in the epidemics, the number secondary infections initiating from infected units are decreased. This number is called as the effective reproduction ratio. An eminent epidemic model that is usually based on the effective contacts concept and it is known as the reed frost model. This model was readily accepted after the introduction. The approximate number of effective contacts are required for reproducing the disease epidemics in models. The field data can be used by the modellers for the rates of infection and epidemiological data for tracing that combines primary and secondary data (Wood and Lafferty, 2013).

Role of Models in Health

There are various ways in which the models can be useful for health.

Retrospective Analysis

When data is available from past, then the model of epidemics can be created as a method to identify the epidemic dynamics. The model is needed to decrease a particular real life epidemic (Blake and Harrison, 2013).

Contingency Planning

On the basis of learned lessons from the past epidemics. The models can be used in a different way to answer the questions that what would happen if this would be done in a different way. The answers of these questions can explain the contingency plan adjustment for handling the future epidemics. It is a model that recreates a group of imaginary epidemics(Blake and Harrison, 2013).

Resource Planning

The epidemic models and their controls can be utilized for estimation of the development of the resource requirements so that they can be planned for. The resource planning is considered to be an aspect of contingency planning but the models can be helpful in short term during the epidemics for predicting the scale of an increase in resource requirements in particular situations(Blake and Harrison, 2013).

Training

The models can be utilized in the form of a virtual epidemic simulators for the purpose of training that can create a group of imaginary epidemics(Blake and Harrison, 2013).

Surveillance Targeting

It is a particular type of model that aims to calculate the disease risk that is initiating in different risk model issues and conditions. This model can be utilized to specify where it is highly needed for the targeting of surveillance efforts(Blake and Harrison, 2013).

Real Time Support of Decision

In the year 2001, the FMD epidemic in UK was spread. These models were utilized for supporting decisions in controlling the policies of real time. A model is needed to simulate a particular epidemic of real life(Blake and Harrison, 2013).

Types of Health Models

There are different types of models that are mainly used for several purposes and this indicates that the different models are usually created to ensemble purpose. The different models can also be created which are mainly based on the various details of health. There are different types of models that are related to health. These include risk models, analytical models, disease models, population models, economic models and the specialized models. The risk models are those which are explained qualitatively and they can also quantify the introduction of risk disease in a population by specific routes. The analytical models are those which aim to develop the relation among disease occurrence and the risk factors. The disease models control eth spread of disease in a population. The population models are those which usually control the population dynamics. The economic models control the use and production of resources and adding on the economic values. The specialized models for specific details like air flow and climatic models are used to model the airborne spread of disease agents (Sarafino and Smith, 2014).

Modelling Principles

Risk Models

The risk modelling is a method that initially explains and identifies a hazard. For instance, the infection of PMD virus in UK. The second stage is to explore the different

pathways of risk by which the hazard can be released. The qualitative models of risk are restricted at this point or a qualitative risk assessment can be acquired as high, medium or low. The quantitative risk modelling needs the quantification of probability in which the hazard release route can be used at every step of risk pathway. The complete risk that a hazard is released is then identified by increasing the probabilities by the stages of each pathway and combining the complete options of all the pathways (Birley, 2013).

Analytical Models

These models are also known as empirical models. The statistical analyses are used to quantify the relationship among disease morbidity and the other variables. The main purpose is to explore the risk factors of disease and they are the complete output of epidemiological research(Birley, 2013).

Disease Models

The models of disease are classified on the basis of microparasitic and the macroparasitic diseases. The different macroparasites have specific life cycle stages external from the mammalian host and it is the part of life cycle that is helpful in identification of disease dynamics that can be modelled in most detail(Birley, 2013).

Conclusion

It can be concluded thatthere are different disease models that are used for controlling the spread of disease. The models can be used for the retrospective analysis, contingency planning, resource planning, training and the surveillance planning. There are several modeling principles

like risk models, analytical models and the disease models. It is recommended that the various models must be created to control the disease spread.

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