Undergraduate students should have a solid background in mathematics, chemistry, and computer science. Once a student is prepared for graduate studies, he or she can choose a specialty within epidemiology (e.g., water pollution, air pollution, pesticide use, toxicology, molecular biology, or outbreak investigation). Some jobs may require a Ph.D. or medical degree.

Epidemiologists use mathematical models in order to track the progress of most infectious diseases. They may also discover the likely outcome of an epidemic or help manage them by vaccination. Some specific areas that epidemiologists may track include:

- transmission, spread, and control of infection
- persistence of pathogens within hosts
- immuno-epidemiology
- virulence
- strain structure and interactions
- evolution and spread of resistance

One specific type of mathematical model used for many infectious diseases, such as measles, mumps, and rubella, is the SIR model. This model consists of three variables: S (susceptible), I (infectious), and R (recovered).

There are many opportunities for employment when you are an Epidemiologist. Employers include:

- Federal, state, and local government
- State, local, and private hospitals
- Colleges, universities, and professional schools
- Scientific research and developmental service facilities
- Pharmaceutical and medicine manufacturing companies

Epidemiology has made a major contribution to understanding the AIDS pandemic. Epidemiologists have played a vital role in determining the pattern of its spread, identifying risk factors and social determinants, and evaluation interventions for prevention, treatment and control.

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