

How do statistics affect our everyday lives?

Statistics is the science of collecting, presenting, analysing and interpreting data. Everyday around the world people collect data and information that is closely entwined with all aspects of life and statistics are the result of the analysis of this data — the interpretation and presentation. Information retrieved from data provides the intelligence necessary for marketing, production and financial models. The vast availability of data, courtesy of today's technology, and opportunities for utilisation of that data are increasing at a rapid rate. Statistics allow differentiation between dubious and rational conclusions and evaluation of the validity of claims based on quantitative evidence.

The value and importance of statistical modelling and forecasting of time series must be recognised. Advantages of this statistical method include easy interpretability, arising from visualisation of results which removes ambiguity, as patterns within data are easy to see. The word 'forecasting' relates to the process of predicting the future with consideration of data from the past and present and is regularly done by the analysis of trends. Application of forecasting techniques in various fields range from climatology to finance and foreign exchange. In regions across the globe, this has been implemented for greater prediction and simulation.

The power of statistics helps to predict the weather. Analysing trends can be useful in detection and prediction of the changing patterns and erraticism of several climatic parameters. The evaluation of meteorological parameters provides useful knowledge about the changing conditions of the climate and its effects. The applicability of results from forecasting should not be underestimated as it is valuable information for industries that depend on weather conditions (e.g. agriculture, construction and transportation). The first stage needed for forecasting is knowing the current weather. Observations about the weather and state of the atmosphere, such as temperature, air pressure and wind speed, are collected from around the world and then fed into powerful supercomputers — these calculations work out how it will change in the future. Meteorological expertise helps to clarify the specifics and gives us predictions of the weather so the statistics of the observations affect our daily lives significantly.

Natural disasters like earthquakes or tsunamis can be anticipated with the correlation of meteorological parameters, collecting essential information and then incorporating the retrieved info through machine learning into the design of forecasting systems. Additionally, statistics help to mitigate the impact of the event and estimate the loss of a population, damage to infrastructure and the social and economic disruption.

Retail businesses may collect consumer information from phones, computers and other online devices which can be used to predict behavior, evaluate preferences and analyse promotions. Targeted advertising uses statistics to increase marketing effectiveness and consequently drive sales. No longer having to rely on assumptions about the behaviour of a target audience, marketers can administer advertisements specifically targeted to individuals based on their interests. Cookies and other analytics tools allow businesses to create more valuable, personalised internet experiences for users as well as increasing sales.

Statistics affect many aspects of manufacturing. By analysing production and distribution data, businesses can improve efficiencies, reduce costs and improve and enhance quality. Understanding root causes is absolutely vital to continuous, prolonged improvement, especially in manufacturing. Therefore, tools that are designed to determine whether or not two variables are correlated or infer which are the causal variables are so important. While standard techniques like traditional linear regression have been used for a long time to great effect, machine learning algorithms allow us to spot correlation and covariance in large data sets. Most manufacturers follow a regular schedule of preventative maintenance where downtime is scheduled at structured (or not) intervals to repair assets before an unanticipated breakdown results in expensive, unplanned downtime and increased maintenance spending. In supply chain management, timing is essential so by using predictive analytics it decreases the amount of added complexities. Statistics allow greater certainty for whether or not there will be disruption to the supply chain and makes it possible to optimise supply chains to reduce risk. With production forecasting, predicting demand is vital for improving production. Data collected about business, operations and suppliers can assist to make preparation easier and more effective for the future. Analysis of data from contrasting sources (to identify links between causes, effects and processes) helps a business enhance its product development strategy, manufacturing processes, marketing of products and logistics of the supply chain and delivery.

Probabilistic statistics are frequently used in clinical and experimental medicine — statistical methods enable the study of diseases and are employed in public health and epidemiological events. Data is analysed to highlight trends or to make a provision for the validity of a diagnostic method, therapy or prognosis for a disease. COVID-19 has put a spotlight on the use of statistics in epidemiological studies and public health as they help to determine the spread of the pandemic and how to go about sensitisation of the populace and curtail the spread. Statistics is a standardised tool of compilation and analysis and has been used valuably to ascertain the demographic figures of those affected, the carriers and to determine decisions as we move throughout the course of the pandemic. The numbers of cases, deaths and infection rates are reported by governments and media outlets daily around the world, and the use of these statistics is effective for government interventions to tackle the virus. As testing gradually became more widely available, the number of cases and deaths caused by the virus were recorded into various systems, allowing for the creation of statistical models to occur. Statistical models presenting data relating to COVID-19, including rate of contact, probability of transmission and vaccination rates, are important because they encapsulate numerical data which is important for stopping the spread of the disease. These models are examined in order to get a sense of the trajectory of COVID-19 such as the daily infectivity and mortality rate. People worldwide are eager to know the updated, latest statistics of the pandemic, the numbers of those vaccinated, new cases and other epidemiological facts and figures to see if the situation is improving.

The outbreak of COVID-19 has completely disrupted various industries (e.g. tourism and retail) both locally and internationally. Statistics help us understand the significant economic consequences of the pandemic and they are analysed by the government to decide how to fight the effects based on indicators referring to unemployment, losses of production output and GDP at both global and country levels. Insufficient information about the social and economic consequences of lockdowns, closed schools and missed education and the overloaded health system creates speculations from the public. Statistics provide information

which can give people up and down the country reassurance as the government can figure out ways to fight the impact of the virus.

From education, science and medicine to social media and sport, statistics play a role in every realm of life today. Statisticians are constantly working to discover and implement world-shaping developments which will eventually help contribute to our understanding of the world of information around us.

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