

## Statistics as a science: history of development and practical significance

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**Abstract:** *This article examines the emergence of statistics as a scientific discipline, the stages of its historical development, and its practical significance in modern society. The origin of statistical observations in ancient times, the process of statistics becoming an independent science, and its role in economic and social spheres are analyzed. The importance of statistics in public administration, economic planning, and scientific research is also highlighted. The close relationship between the development of statistical methods and digital technologies is substantiated. Particular attention is paid to the reliability of statistical information and the effective use of statistical data.*

**Keywords:** *statistics, statistical observation, historical development, data analysis, economic processes, public administration*

**Introduction.** The sustainable development of modern society, the efficient functioning of economic systems, and the in-depth analysis of social processes are directly dependent on reliable and accurate statistical data. Today, the rapid growth of information flows, along with the dynamic development of digital technologies and artificial intelligence, has further increased the importance of statistical data in social life. The success of any socio-economic decisions, government programs, and strategic plans primarily depends on the accuracy and reliability of statistical analysis results.

The science of statistics studies mass phenomena and processes in society from a quantitative perspective and serves to identify the patterns of their development. Through statistics, key indicators such as economic growth rates, living standards of the population, employment, inflation, and demographic conditions are analyzed. Therefore, statistics is not only a science of theoretical significance but also an important scientific field with strong practical relevance.

**The emergence and historical development of statistics.** The earliest forms of statistics emerged during the period of ancient civilizations. In Ancient Egypt, China, Babylon, and Rome, the need to determine population size, account for land areas, and plan taxation and military resources led to the development of statistical observations. During this period, statistical activities mainly served state needs and were conducted in the form of official records and calculations.

In the seventeenth century, statistics began to take shape as an independent scientific discipline. Scientific works by English scholars John Graunt and William Petty on the analysis of demographic conditions laid the initial theoretical foundations of statistical analysis. It was during this time that statistical indicators started to be used to assess societal development.

In the eighteenth and nineteenth centuries, statistics developed widely in Europe, particularly in Germany. During this period, statistics was regarded as a branch of "state science" and served to describe the political, economic, and social conditions of a country. Later, the development of probability theory and mathematical statistics further strengthened statistics as a scientific discipline.

In the twentieth century, the emergence of computer technologies marked a new stage in the development of statistics. The ability to rapidly process large volumes of data, perform modeling, and generate forecasts significantly expanded the scope and application of statistical methods.

YEARS	Development Stage	Explanation
XVIII	Formation of the concept of statistics	Earlier demographic calculations were systematized
1800-	School-based statistical methods	Probability theory and demographic statistics emerged
1900-1950	Modern statistical methods	Scholars such as Neyman–Pearson and Fisher developed methodological foundations
1950-1980	Computer-assisted statistical analysis	Large volumes of data began to be processed efficiently

The practical significance of statistics in the modern context. Today, the practical significance of statistics is evident in all spheres of social life. In the economic sector, statistics serves as a primary tool for analyzing indicators such as production volume, inflation rates, employment, and gross domestic product. Based on these data, directions of economic policy are determined.

In public administration, statistics plays an important role in strategic planning and the development of social programs. Indicators related to living standards, social protection, and the effectiveness of education and healthcare systems are evaluated through statistical analysis. This enables the more effective implementation of public policies. In scientific research, statistics has significant methodological importance in ensuring the reliability of results and enhancing the scientific validity of conclusions. In addition, in business and entrepreneurial activities, statistics is widely used to study market conditions, analyze supply and demand, and assess risks.

The integration of statistical methods and digital technologies. The development of digital technologies has created new opportunities for the field of statistics. Big Data, artificial intelligence, and automated information systems are increasing the accuracy and efficiency of statistical analysis. The effective processing of collected data and ensuring their reliability through statistical methods remain among the most important tasks of the modern era.

Conclusion. In conclusion, the science of statistics has developed gradually throughout the process of societal advancement and has become an essential scientific foundation for analyzing socio-economic life in the modern era. Statistical observations, which initially emerged due to the needs of public administration in ancient times, gradually evolved into an independent scientific discipline and were enriched with modern scientific methods. The improvement of statistical techniques has made it possible to gain a deeper understanding of mass phenomena and processes occurring within society. In the current context, the practical importance of statistics continues to grow. Statistical analysis serves as a crucial tool in promoting economic development, increasing the efficiency of public administration, identifying social problems, and addressing them effectively. Especially in conditions characterized by digital technologies and large volumes of data, the reliability and accuracy of statistical information have become increasingly significant. Therefore, the in-depth study of statistics, the widespread application of its modern methods in practice, and the effective use of statistical data are among the key factors of socio-economic development. The proper utilization of the scientific and practical potential of statistics will contribute to ensuring sustainable development in the future.

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