

Keywords: COVID-19; SARS-CoV-2; Coronavirus; Pandemic; Epidemiology; Clinical features; Transmission dynamics; Diagnostics; Treatment; Prevention; Public health; Vaccines; Variants; Societal impact; Pandemic preparedness

Introduction

The emergence of COVID-19, caused by the novel coronavirus SARS-CoV-2, has spurred a global health crisis of unprecedented proportions [1]. Since its initial identification in December 2019 in Wuhan, China, the virus has rapidly spread across continents, causing widespread illness, death, economic disruption, and societal upheaval [2]. In this article, we delve into the multifaceted dimensions of COVID-19, exploring its virology, epidemiology, clinical manifestations, preventive measures, treatment strategies, and the socio-economic impacts it has wrought upon the world [3].

The emergence of Coronavirus Disease 2019 (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has triggered one of the most significant global health crises of modern times [4]. This outbreak, which originated in the city of Wuhan, Hubei province, China, was first reported to the World Health Organization (WHO) in December 2019 and quickly escalated into a pandemic of unprecedented scale and impact. The rapid spread of the virus across international borders and continents has underscored the interconnectedness of our modern world and the vulnerability of global health systems to emerging infectious threats [5]. SARS-CoV-2 belongs to the family Coronaviridae, which comprises enveloped, positive-sense, single-stranded RNA viruses known for their propensity to cause respiratory and gastrointestinal infections in humans and animals. While the exact origins of SARS-CoV-2 remain under investigation, zoonotic transmission from bats to humans, possibly via an intermediate host, is believed to have initiated the outbreak [6]. The virus primarily spreads through respiratory droplets generated by infected individuals during coughing, sneezing, or talking, and can also be transmitted via contact with contaminated surfaces or fomites. Clinical manifestations of COVID-19 range from asymptomatic or mild illness to severe respiratory distress and organ failure, with older adults and individuals with underlying medical conditions at heightened risk of severe disease and mortality [7]. Common symptoms include fever, cough, dyspnea, fatigue, myalgia, and anosmia, although a wide spectrum of clinical presentations has been observed, complicating early diagnosis and case identification [8]. Diagnostic testing for COVID-19 typically involves molecular assays such as reverse transcription-polymerase chain reaction (RT-PCR) to detect viral RNA in respiratory specimens, although serological tests for detecting antibodies against SARS-CoV-2 are also available for surveillance and epidemiological studies [8]. Management of COVID-19 is largely supportive, focusing on symptomatic relief

