

# COVID-19 Infection in Pediatric Population: An Overview of the Epidemiology, Clinical Features, Diagnosis, and Nursing Management in Children

Eftychia Ferentinou, Paediatric Hospital of Athens “Agia Sofia”, Greece & University of West Attica, Greece

Despoina Pappa, “Hygeia” Hospital of Athens, Greece & University of West Attica, Greece

Chrysoula Dafogianni, University of West Attica, Greece

## ABSTRACT

COVID-19 disease, caused by SARS-CoV-2 virus infection, started in the province of Wuhan in China in December 2019 and has reached pandemic proportions by March 2020 affecting many countries worldwide. The purpose of this review is to present scientific evidence found until April 30, 2020 on the characteristics of COVID-19 in the pediatric population. Bibliographical review of articles has been conducted through PubMed and Google Scholar, from January to April. Most of the research included was conducted in China because only a small number of studies from Europe and other affected areas could be found, as the pandemic is still in progress. As for the children, the disease turns up with mild symptoms while the mortality rate in childhood is particularly low. The diagnosis of the disease is made through specific criteria, while a therapeutic protocol is applied for the treatment of the disease. The virus is mainly transmitted through the respiratory tract, although it has not been scientifically proven that the virus is transmitted through vertical transmission from mother to fetus.

## KEYWORDS

Children, Clinical Feature, Coronavirus, COVID-19, Novel Coronavirus, Pediatric Patients, Prevalence

## INTRODUCTION

On December 2019, at Wuhan city in the province Hubei in China, a series of pneumonia cases appeared. On January 9, 2020, the health authorities in China announced that this is a new beta coronavirus, capable of transmission among human due to exposure to the virus SARS -CoV-2 (Hui et al., 2020).

The virus genome, which was fully analyzed within a few days, is genetically similar to that of a bat virus, and is thought to have infected the human with an intermediate host, most likely the scaly eater. The virus has a high affinity for a specific receptor on the surface of human cells (ACE2), through which it penetrates and causes infection. The higher expression of this male receptor in China may explain the greater morbidity of men, according to current clinical data (Dong et al., 2020 b). It has spread rapidly to other parts of China and then to Europe as well as to more than 180 countries around the world (Dong et al., 2020 a). On February 11, 2020, it was named COVID -19 and on March 11, 2020, it was marked as pandemic by World Health Organization (Dong et al., 2020 a).

The SARS-CoV-2 virus has been transmitted from animals to humans, and the clinical disease called COVID-19 is caused by a new beta-virus virus, now called SARS-CoV-2. SARS-CoV-2

DOI: 10.4018/IJRQEH.2021010102

Copyright © 2021, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

shares a 79% identity sequence with SARS-CoV, the virus that caused the outbreak in 2002-2003 (Kawana, 2016). The coronavirus is a large RNA monoclonal virus that infect humans and a wide range of animals. The coronaviruses were described for the first time in 1966 by Tyrell & Bynoe, who cultivated viruses from patients with common cold (Tyrell & Bynoe, 1966).

Coronaviruses are a group of viruses that usually cause respiratory infections of varying severity in humans and animals. It is estimated that about one-third of upper respiratory infections in humans can be caused by coronaviruses (Kawana, 2016).

Infections can range from a common cold to more serious illnesses such as Severe Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) (Kawana, 2016). Based on their morphology resembling solar corona, they took this name from the Latin «corona» which means crown. There are four subfamilies; alpha, beta, gamma and delta-coronavirus. While alpha and beta-coronavirus are apparently derived from mammals, especially bats, gamma and delta viruses are derived from pigs and birds. The size of the genome ranges between 26 kb and 32 kb. SARS-CoV-2 belongs to the B genealogy of b-coronavirus and is closely related to the SARS-COV virus (Zhou et al., 2020).

## **EPIDEMIOLOGICAL CHARACTERISTICS**

Evidence by bibliography review from January to May 2020 was used to describe the characteristics of COVID19 in children. As the pandemic progresses globally, the epidemiological data presented are until May 17 and they are changed every day.

### **Incidence on the General Population**

From December 31, 2019 to May 17, 2020 according to the data of the European Agency infections (European Center for disease prevention and control) 4,597,894 cases COVID 19 and 311,588 deaths were recorded. The countries with the highest death tolls are the United States with 123,091 deaths, the United Kingdom with 34,466 deaths, Italy with 31,763 deaths, France with 27,625 deaths, Spain with 27,563 deaths, Belgium with 9,005 deaths, Iran with 6,937, China with 4,638 deaths, Turkey with 4,096 and the rest of Europe follow with fewer deaths in general population until May 17, 2020. Greece recorded 162 deaths with an average age of 76 years and 2,819 confirmed cases up to May 16 (National Public Health Organization, 2020).

### **Incidence on the Pediatric Population**

According to statistics from the national public health organization (National Public Health Organization, 2020) up to May 1, 2020 Greece reported 127 confirmed cases in children aged 0-17 years old, representing 4,8 % of cases in general population of which 56 are boys and the remaining 67 are girls. None of this age group has needed intubation in the Intensive Care Unit and no child has passed away in Greece, according to the official data of EODY (National Public Health Organization, 2020).

In China, the recorded confirmed cases of <18 years old are estimated to be 2.4% of the recorded cases that have been confirmed in the general population (Zhu et al., 2020).

The largest epidemiological study in the pediatric population been done so far is in China, in which from January 16, 2020 to February 8, 2020, 2143 children were registered with COVID -19 and 731, a percentage of 34.1%, were laboratory-proven and 1412 children (65.9%) were suspected cases based on epidemiological criteria (Dong et al., 2020 b).

As of February 11, 2020, 44,672 confirmed cases were recorded in China, of which 2% were aged 0-19 years old. Of all these 416 Cases (0.9%) was aged less than 10 years old and 549 Cases (1.2%) were Aged 10-19 years old (Zhang et al., 2020).

In Italy until March 18, 2020, 270 children recorded cases (1.2%) of 22,512 of incidence in the general population without the death report (Livingston et al., 2020). In America, as of March 16,

14 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/article/covid-19-infection-in-pediatric-population/265278](http://www.igi-global.com/article/covid-19-infection-in-pediatric-population/265278)

## Related Content

---

### Multi-Dimensional Criteria for the Evaluation of E-Health Services

Alalwany Hamid and Alshawi Sarmad (2010). *Health Information Systems: Concepts, Methodologies, Tools, and Applications* (pp. 8-25).

[www.irma-international.org/chapter/multi-dimensional-criteria-evaluation-health/49852](http://www.irma-international.org/chapter/multi-dimensional-criteria-evaluation-health/49852)

### Enhancing 'Fit' of Health Information Systems Design Through Practice Support

Craig E. Kuziemsky (2010). *Health Information Systems: Concepts, Methodologies, Tools, and Applications* (pp. 642-658).

[www.irma-international.org/chapter/enhancing-fit-health-information-systems/49891](http://www.irma-international.org/chapter/enhancing-fit-health-information-systems/49891)

### Fast and Robust Fuzzy C-Means Algorithms for Automated Brain MR Image Segmentation

László Szilágyi, Sándor Miklós Szilágyi and Zoltán Benyó (2008). *Encyclopedia of Healthcare Information Systems* (pp. 578-586).

[www.irma-international.org/chapter/fast-robust-fuzzy-means-algorithms/12987](http://www.irma-international.org/chapter/fast-robust-fuzzy-means-algorithms/12987)

### Patient Safety Concerns among Emergency Medical Staff and Patients

Pi-Fang Hsu, Wen-Chun Tsai and Chia-Wen Tsai (2013). *International Journal of Privacy and Health Information Management* (pp. 29-52).

[www.irma-international.org/article/patient-safety-concerns-among-emergency/77005](http://www.irma-international.org/article/patient-safety-concerns-among-emergency/77005)

### The Process of Medical Curriculum Development in Malaysia

V. K. E. Lim (2012). *International Journal of User-Driven Healthcare* (pp. 33-39).

[www.irma-international.org/article/process-medical-curriculum-development-malaysia/64328](http://www.irma-international.org/article/process-medical-curriculum-development-malaysia/64328)