

Multisystemic Inflammatory Syndrome in Pediatric Patients

AI and Analytics in the Fight Against COVID-19

A SCALABLE HEALTH WHITEPAPER



TABLE OF CONTENT

INTRODUCTION..... 3

WHAT IS MULTISYSTEMIC INFLAMMATORY SYNDROME?.....4

THE LINK BETWEEN MIS-C AND COVID-19.....5

HOW CAN ARTIFICIAL INTELLIGENCE ASSIST IN THE FIGHT AGAINST COVID-19?.....6

AI IN THE PREVENTION AND SPREAD OF COVID-19.....7

QUICKLY DIAGNOSING PEDIATRIC PATIENTS INFECTED WITH COVID-19.....8

CONCLUSION.....10

ABOUT SCALABLE HEALTH.....11

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by the newly discovered coronavirus, SARS-CoV-2. The virus was first identified in Wuhan, China, in December 2019 after an outbreak of unidentified pneumonia and reported to the WHO on December 31, 2019. Although most people experience mild to moderate respiratory symptoms, it was initially believed that only adult populations and those with underlying medical problems were susceptible to the worsening symptoms. Yet, cases started to appear in pediatric instances across the world in April and now make up approximately 2% of the total cases worldwide. By early February 2020, the Chinese CDC reported pediatric patients diagnosed with COVID-19, although data remained limited due to low case volume.

However, in April, physicians in the UK were first alerted about the multisystem inflammatory syndrome, after which physicians in other European countries reported clusters of similar cases. On May

14, the United States CDC issued a health advisory to thousands of doctors stating that an inflammatory syndrome has been associated with COVID-19 infection among children and young adults.

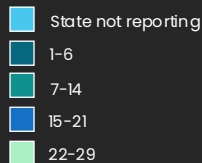
The CDC is currently collaborating with domestic and international partners to investigate reports of a multisystem inflammatory syndrome associated with coronavirus. As of now, recommendations state that all pediatric patients presenting with the clinical manifestations should get a COVID PCR if negative, antibody testing, and other laboratory studies, and cardiac testing. However, another critical tool, artificial intelligence, has played a crucial role in helping combat COVID-19. As a result, research groups and institutions are exploring the use of AI and analytics in the prevention and spread of COVID-19 and may even assist in the diagnosis of multisystemic inflammatory syndrome in future studies.

186 MIS-C CASES

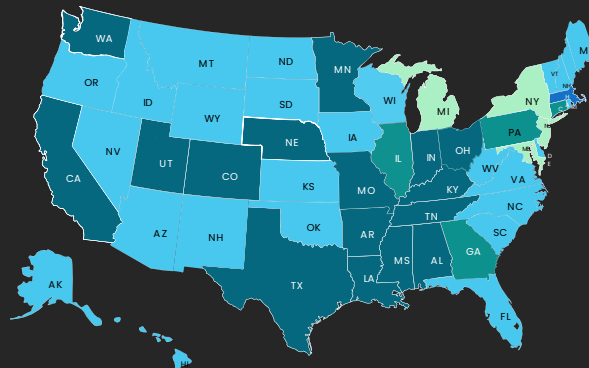
26 STATES

Epidemiology of MIS-C

NUMBER OF CASES IDENTIFIED IN REPORTING STATES



MARCH 15 – MAY 20, 2020



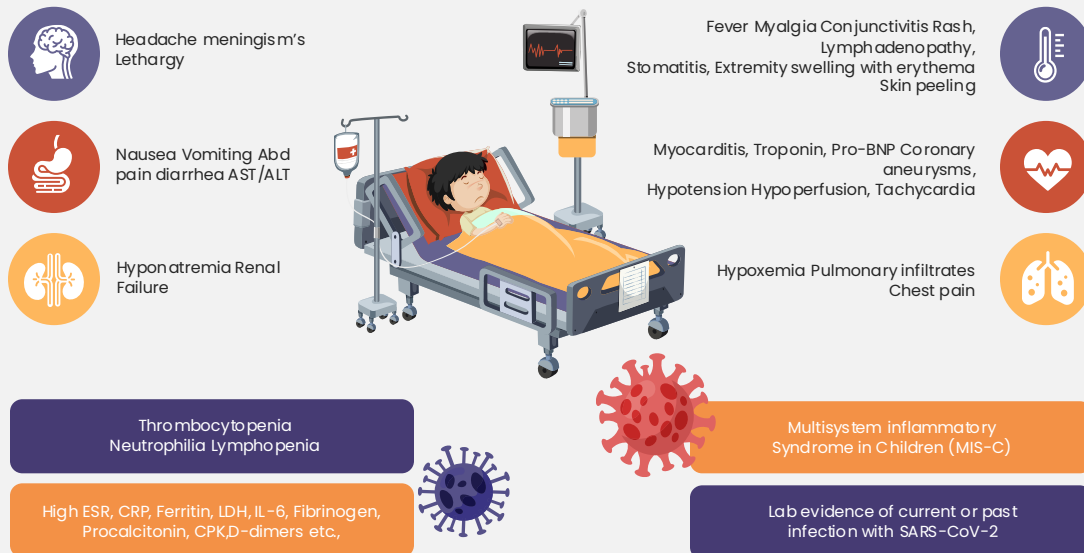
Hospital-reported MIS-C Cases by State

WHAT IS MULTISYSTEMIC INFLAMMATORY SYNDROME?

In April 2020, pediatric specialists began to notice an increase in the number of patients diagnosed with Kawasaki disease as compared to the previous years. Kawasaki disease is an acute, self-limited febrile illness of unknown cause that predominantly affects children less than five years of age. Despite the expectation of younger patients, a significant number of recent cases involved individuals up to 21 years old who exhibited persistently high inflammatory markers. These patients, showing consistent symptoms and positive antibody tests, were ultimately diagnosed with multisystem inflammatory syndrome (MIS).

Multisystem inflammatory syndrome (MIS-C), formerly referred to

as pediatric inflammatory multisystem syndrome (PIMS), is a rare inflammatory disease in the blood vessels affecting various organs, including the heart, lungs, kidney, brain, skin, eyes, or GI. It affects approximately 0.6% of the severe cases of pediatric patients infected with COVID-19. MIS-C shares common features with other pediatric inflammatory conditions, including Kawasaki disease and toxic shock syndrome (TSS). At this time, the CDC is still attempting to understand MIS-C and why some children are symptomatic while others are not. However, it is established that most children who initially presented with MIS-C had been exposed to COVID-19 or around someone with COVID-19.

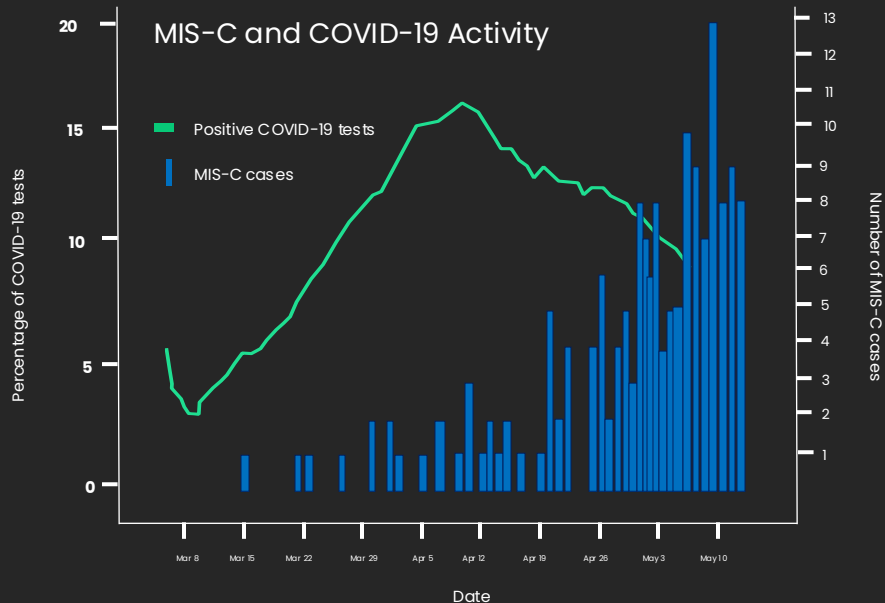


THE LINK BETWEEN MIS-C AND COVID-19

The lack of a definitive case definition makes diagnosing critical paediatric cases challenging. These cases present with various features such as negative COVID-19 tests, shock, cardiac dysfunction, and MIS-C. Observed clinical presentations encompass TSS-like shock, Septic or cardiogenic shock with cardiac impairment, and Kawasaki-like disease, either alone or in combination.

The time of the display of symptoms usually occurs one month

after infection, which is why most cases test negative for COVID-19, although positive for antibodies. Based on early studies, it appears that children of all ages are at risk for COVID-19, although complications still seem to be less common among children than adults. However, abdominal symptoms appear more often than the respiratory symptoms seen in adult patients, and children may present with other symptoms, including fever, sore throat, headache, rash, or conjunctivitis.



HOW CAN ARTIFICIAL INTELLIGENCE ASSIST IN THE FIGHT AGAINST COVID-19?

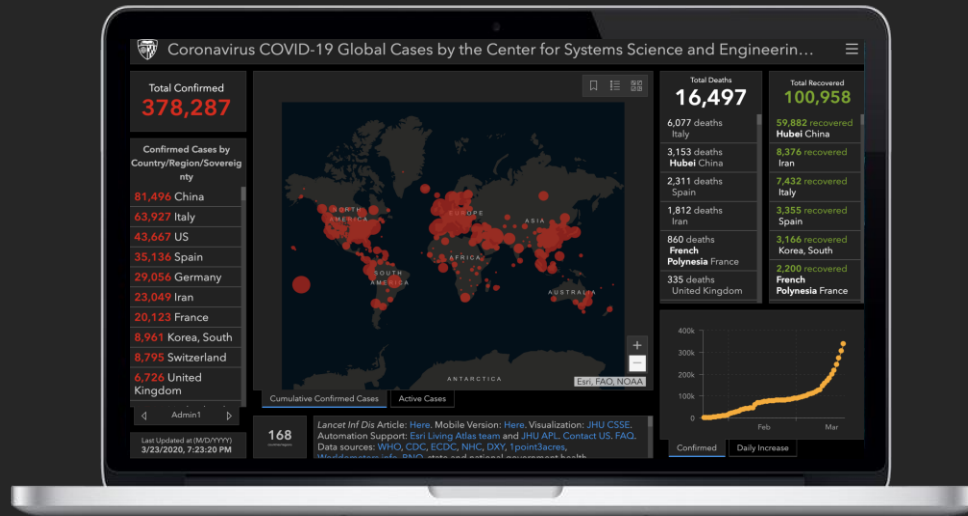
Since 2013, the CDC has been hosting an annual competition to most accurately predict the severity and spread of influenza. The competition received dozens of entries, many of which used machine learning algorithms that have been trained to determine correlations on large datasets. However, many of those teams that used to be involved in the influenza challenge are now moving their focus towards spread of COVID-19. In response to the COVID-19 pandemic, the White House and other leading research groups

have prepared the COVID-19 Open Research Dataset (CORD-19), a resource available to global research communities to apply analytics and AI techniques to generate insight in support of the fight against COVID-19. The goal in this global pandemic is to use AI tools to identify the first signs of a new disease outbreak, assess the current state of an epidemic, and help recover the disease.

AI IN THE PREVENTION AND SPREAD OF COVID-19

Even before the world grasped the threat of COVID-19, AI systems, notably Boston Children's Hospital's Healthmap, had already signalled the emergence of the outbreak that became a pandemic. HealthMap uses AI to scan for signs of COVID-19 outbreak in the media reports, news reports, and internet search queries, and other information streams.

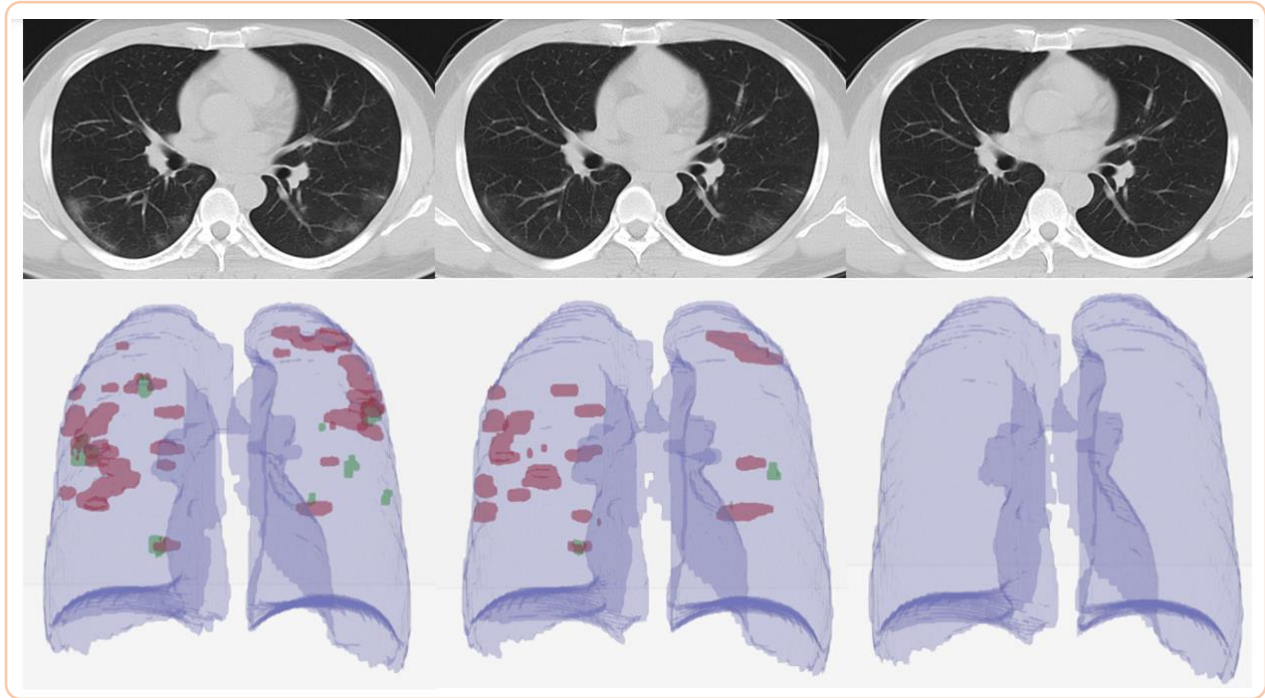
Across the globe, AI researchers have been teaming up with tech companies to monitor for signs of outbreaks using similar methods to watch mainstream news, online content, and other information channels in multiple languages. Other institutions such as John Hopkins University and OECD have also made available interactive dashboards that track the virus spread through news and real-time data on confirmed cases, recoveries, and deaths.



QUICKLY DIAGNOSING PEDIATRIC PATIENTS INFECTED WITH COVID-19

Early studies have shown AI as a potential tool for rapidly diagnosing COVID-19 patients. With the assistance of AI algorithms, integrating chest CT findings with clinical symptoms, exposure history, and laboratory testing can lead to the rapid diagnosis of patients positive for COVID-19. AI algorithms are crucial for managing the pandemic, offering valuable support in triaging patients and alleviating strain on healthcare systems. A collaborative algorithm could significantly reduce healthcare overload and enable the rapid identification of abnormal imaging findings and their severity.

A study of 20 children with COVID-19 revealed that all chest CT scans showed abnormalities, including subpleural lesions (100%), ground-glass opacities (60%), and consolidation with a halo sign (50%). Therefore, AI algorithms can be valuable tools for rapidly diagnosing pediatric COVID-19 cases by analyzing imaging and identifying these characteristic abnormalities, in conjunction with exposure history and lab results.



Corona Score: 191.5 cm³
Relative Corona Score: 1

CT Scan #1 –
27 Jan 2020

49% Reduction
in Corona Score

Corona Score: 97.1 cm³
Relative Corona Score: 0.51

CT Scan #2 –
31 Jan 2020

Recovery

Corona Score: 0 cm³
Relative Corona Score: 0

CT Scan #3 –
15 Feb 2020

Image: RADLogics

Using three CT scans from a single coronavirus patient, the RADLogics algorithms quantifies the amount of recovery with a “corona score.”

CONCLUSION

Further research must be conducted to evaluate the efficacy of AI in COVID-19 pediatric patients, given the low case numbers. However, AI could have great potential in the prevention and spread of COVID-19 in pediatric patients and quickly diagnose MIS-C. Although AI cannot replace traditional public health monitoring, it can certainly be used to analyze the data being collected and help prevent the spread of the disease, diagnosis, and recovery.

As the pandemic continues, social distancing and school closures remain in place to prevent further spread of the disease in children. Modeling studies show that school closures alone have a limited impact on COVID-19 mortality. However, AI technology can proactively assist in surveillance and contact tracing within pediatric populations, which is essential for controlling the virus and protecting future generations.

Scalable Health Solutions:

- Covid Patient Input Form
- Post discharge follow up application
- Supply Chain Analytics
- Risk Stratification Analytics
- Operation and workforce optimization analytics

Turn Knowledge Into Action Visit
Our Website

[IntelliCovid](#)

About Scalable Health

Scalable Health is healthcare division of Scalable Systems focused on providing innovative products and solutions in healthcare and life sciences market.

www.scalablehealth.com

About Scalable Systems

Scalable Systems is a Data, Analytics & Digital Transformation Company focused on vertical specific innovative solutions. By providing next generation technology solutions and services, we help organizations to identify risks & opportunities, achieve sales and operational excellence to gain an innovative edge.

www.scalable_systems.com

Scalable Health

Email: info@scalablehealth.com

Web: www.scalablehealth.com

Copyright © 2025 Scalable Health. All Rights Reserved.

While every attempt has been made to ensure that the information in this document is accurate and complete, some typographical errors or technical inaccuracies may exist. Scalable Health does not accept responsibility for any kind of loss resulting from the use of information contained in this document. The information contained in this document is subject to change without notice. Scalable Health logos, and trademarks are registered trademarks of Scalable Health or its subsidiaries in the United States and other countries. Other names and brands may be claimed as the property of others. Information regarding third party products is provided solely for educational purposes. Scalable Health is not responsible for the performance or support of third party products and does not make any representations or warranties whatsoever regarding quality, reliability, functionality, or compatibility of these devices or products.