

Acknowledgments

 "Direct and indirect effects of the COVID 19 pandemic on children with cardiovascular disease" South African heart Journal.

Stephen Brown, Antoinette Cilliers, Ebrahim Hoosen, John Lawrenson, Hopewell Ntsinjana

 "COVID-19 and Rheumatic Heart Disease" Cardiopulse, European Heart Journal

Andrea Beaton, Jeremiah Mwangi, Kathryn A Taubert



Total cases



= 0





Account >

Confirmed

8,92M

+183K

Recovered

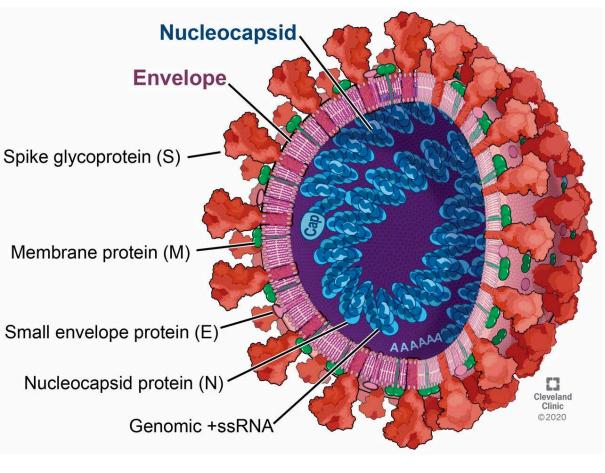
4,41M

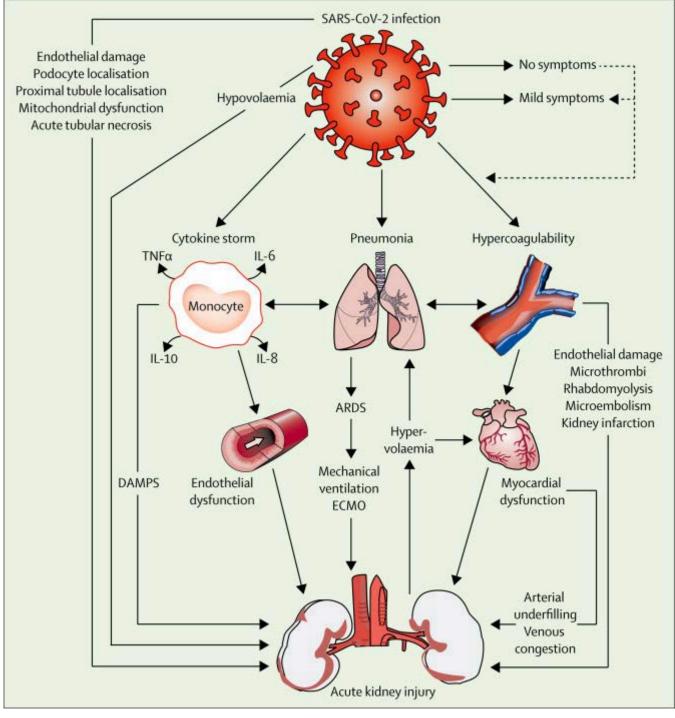
Deaths

467K

+4 742

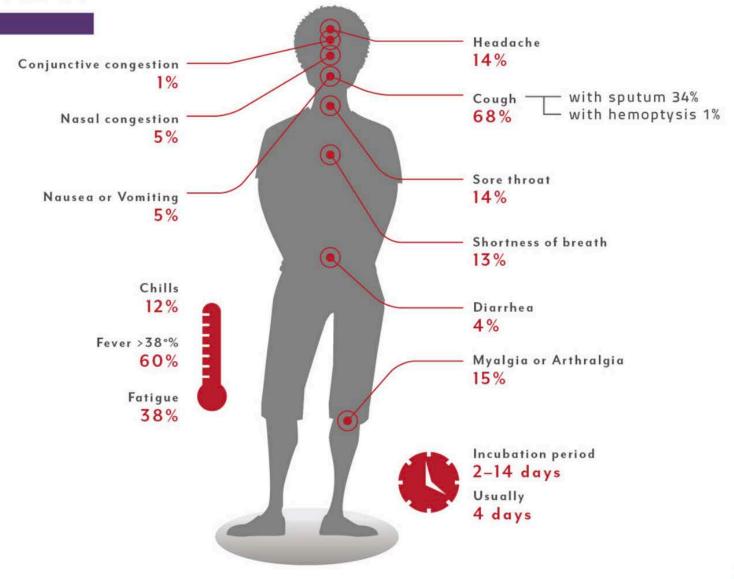
ocation	Confirmed	Recovered	Deaths
United States	2,32M	722K	122K
	+28 095		+283
S Brazil	1,09M	543K	50 659
	+17 459		+641
Russia	592K	344K	8 206
	+7 728		+109
India	425K	237K	13 699
	+15 413		+306
₩ United Kingdom	304K	_	42 632
	+1 221		+0





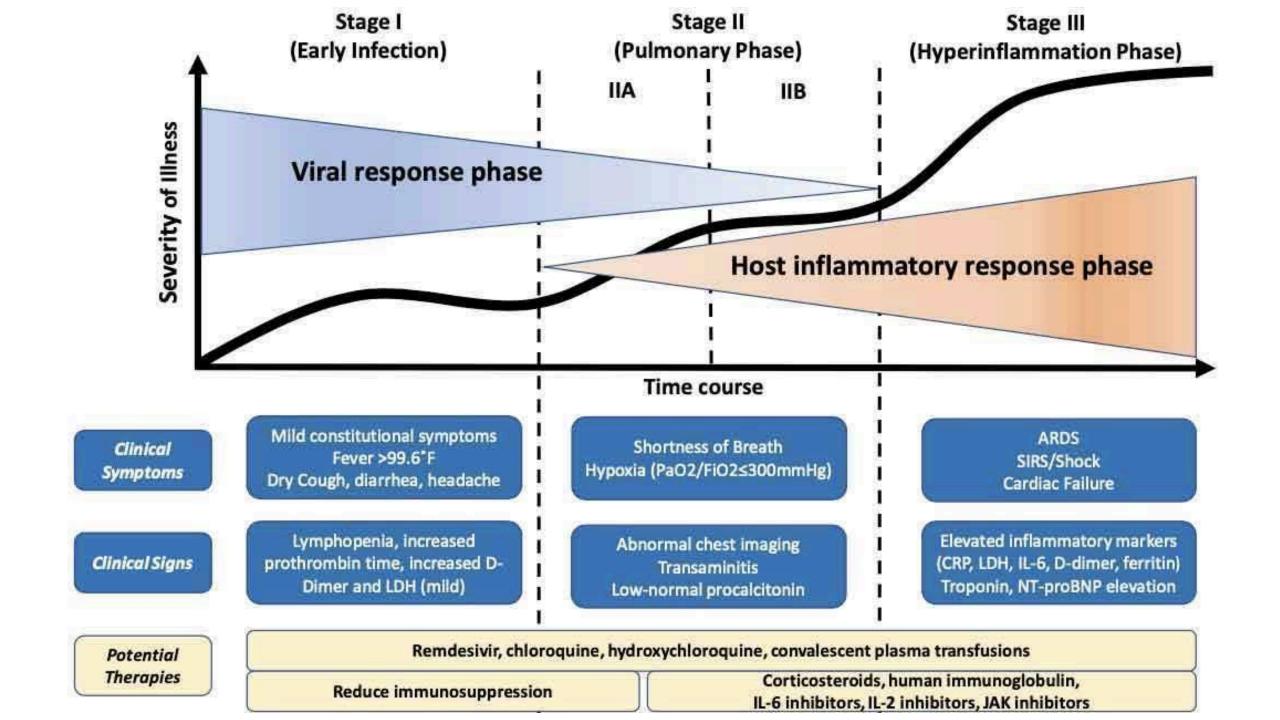
Coronavirus COVID-19

Signs and symptoms









"All the News That's Fit to Print"

The New York Times

VOL. CLXIX No. 58,703

0: 2020 The New York Times Company

NEW YORK, SUNDAY, MAY 24, 2020

U.S. DEATHS NEAR 100,000, AN INCALCULABLE LOSS

They Were Not Simply Names on a List. They Were Us.

Numbers alone cannot possibly measure the impact of the coronavirus on America, whether it is the number of patients treated, jobs interrupted or lives cut short. As the country nears a grim milestone of 100,000 deaths attributed to the virus, The New York Times scoured obitsaries and death notices of the victims. The 1,000 people here reflect just 1 percent of the toll. None were mere numbers.

Patricia Dowd, 57, San Jose, Calif., auditor in Silicon Valley - Marion Krueger, 83, Kirkland, Wash., greatgrandmother with an easy laugh - Jermaine Ferre, 77, Lee County, Fla., wife with little time to enjoy a new marriage - Cornelius Lawyer, 84, Bellev-

could be a real jokester + Michael Sorkin, TL, New York City, champion of social justice through architecture -George Valentine, 66, Washington, D.C., lawyer who mentored others -Susan McPherson Gottsegen, 74, Palm Beach, Fla., loval and generous friend to many - Andreas Keutsoudskis, 59, New York City, tradblazer for TriBeCa · Bob Barman, 64, St. Petersburg, Fla., leader in Florida Pride events - Noel Sinkiat, 64, Olney, Md., nurse planning for retirement - Thomas E. Anglin, 85, Cumming, Ga., created many wonderful memories for his family . Robert Manley Argo Jr., 75, South Bas: Calif. member of Del Amo Flyers - Michael McKinnell, 84, Beverly, Mass., architect of Boston's monumental City Hall Huguette Dorsey, 94, Somerville, N.J., coached several championship-winning junior high girls baskethall teams · Lynne Sierra, 68, Roselle, Ill., grandmother who was always full of ideas · Louvenia Henderson, 44, Tonzwanda, N.Y., proud single mother of three - Carol Sue Rubin, 69, West Bloomfield, Mich., loved travel, mahieng and crossword pazzles - Marien Lucille

statesman in the construction industry - Chir Dunlap, 89, Washington, pilot still teaching people to fly at 88 -Marylou Armer, 43, Sonoma Valley, Calif., veteran police detective - Regina D. Cullon, 81, Shrewsbury, Mass., small in stature but strong in spirit . Sandra Santos-Vireaino, 54, New York City, beloved public school teacher . Frank Gabrin, 60, New York City, emergency mom doctor who died in husband's arms + Sterling E. Matthews, 60, Midlothian, Va., cancer survivor who served as a deacon - Alby Kass, 89, California, lead singer of a Yiddish folk group + Rager Eckart, 75, Indiana, retired firefighter and old-school burber - Martin Douglas, 71, New York City, maestro of a steel-pan band . Daniel Spector, 68, Memphis, menter to other Memphis artists - Mary Minervini, 91, Oak Lawn, III., sign-language interpreter - Salomon S. Podgursky, 84, New Jersey, loved to figure out how things worked . Dule E. Thurman, 65, Lexington, Ky, tailor known for his exacting work and strong opinions - Ellis Marsalis, 85, New Orleans, jazz pianist and patriarch of a family of mu-

Vincent Lionti, 60, New York City, Met. Opera violist and youth orthestra conductor - Ann Yeungerman Smoler, 87, New York City, had a passion for social justice - Thomas Waters, 56, New York City, armed the affordable bousing movement with data and analysis Luke Workoff, 33, Huntington, N.Y. his relentless passion was for his fam-By and friends - José Diaz-Agata, 38, Palm Beach, Fla., served with the Palm Beach County Sheriff's Office for 14 years + Antonio Nieves, 72, Chicago, always seemed to be busy with some home project. . Jeanne Hammond Byrnes, 97, Danbury, Conn., received numerous awards for her accounting skills . Alice Coopersmith Furst, 87, Kentfleid, Calif., in the first. class of girls admitted to the Bronx. High School of Science . Bobby Lee Barber, 84, Buckley, Wash., Seahawks season-ticket holder + Thomas A. Adamavich, 78, Sheboygan, Wis., especially proud of his Lithuanian heritage Kyra Swartz, 33, New York, volunteered for pet rescue organizations -Rhoda Hatch, 73, Chicago, first in her family to graduate college - Regina

Novominsker Hasidic dynasty - Jaseph E Kelly, 51, New York City, did two tours through the Panama Canal to Antarctica + John Prine, 73, Nashville, country-folk singer who was a favorite of Bob Dylan - Perry Buchalter, 63, Florida, quiet hero - Monica Maley, 74, Rehoboth Beach, Del., loved animals, had dogs and cats, and rode horses - Thomas Tarbell Russell, 83, Longmeadow, Mass., mentored by the computer science pioneer Grace Hopper - Buth Skapinok, 85, Reseville, Calif., backyard birds were known to eat from her hand - Furalys Havir, 92, Minnesota, her favorite thing was meeting new people . Turrin Jamal Howard, 26, Waterbury, Conn., gentle giant, athlete and musician . James O'Brien Johnson, 74, Joplin, Mo., pastor of Mt. Sinai Church of God in Christ Joseph W. Hammond, 64, Chicago, stopped working to look after his aging parents - Morris Leeb, 90, Northbrook, III., endlessly curious, never really finished - Dante Dennis Flagello, 62, Rome, Ga., his greatest accomplishment was his relationship with his wife + Tommie Adams, 71, Chica-

72, Bristol, Conn., loved writing birthday and holiday cards, poems and lists. Charles Constantino, 86, Mento Park. N.J., worked 40 years for The New York Times . Ben Doherty, SJ, Boston, stockbroker who founded Doherty Financial Services - John Horton Conway, 82, New Brunswick, N.J., mathematician known as the "magical gemiss" - Stanley Chera, 77, New York City, developer and friend of the president - Robby Browne, 72, New York City, Realtor and philanthropist who socialized with celebrities - Wyen Handman, 97, New York City, acting teacher and a founder of the American Place Theater + Adam Kovnes, 72, New York City, cartoonist and an expert on musicals - Peter Brewn, 53, New Jersey, manager of the S.W. Brown & Son Funeral Home - Brene Gasior, 94, Pennsylvania, great-grandmother with a flair for pizzelles - Stanley L. Morse, 88, Stark County, Ohio. trombonist who once turned down an offer to join Duke Ellington's orchestra - Margaret Laughlin, 91, Massachusetts, had a mystic's direct sense of wonder and oneness . Cynthia

What do we know?

SCIENCE

Why the Coronavirus Hits Kids and Adults So Differently

COVID-19 is much less severe in children, and it could have to do with a child's still-developing immune system.

SARAH ZHANG MAY 15, 2020



MORE STORIES

The Kids Aren't All Right

VANN R. NEWKIRK II



Dear Therapist: What's Your Advice to Parents Whose Kids Are Stuck at Home During the Coronavirus Lockdowns?



LORI GOTTLIEB

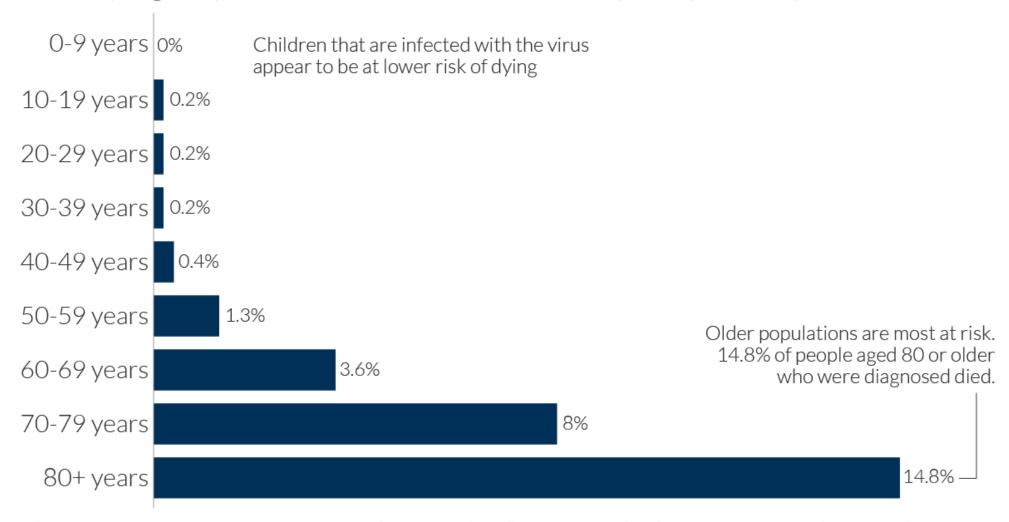
The Epidemic That Preyed on Children



Coronavirus: early-stage case fatality rates by age-group in China



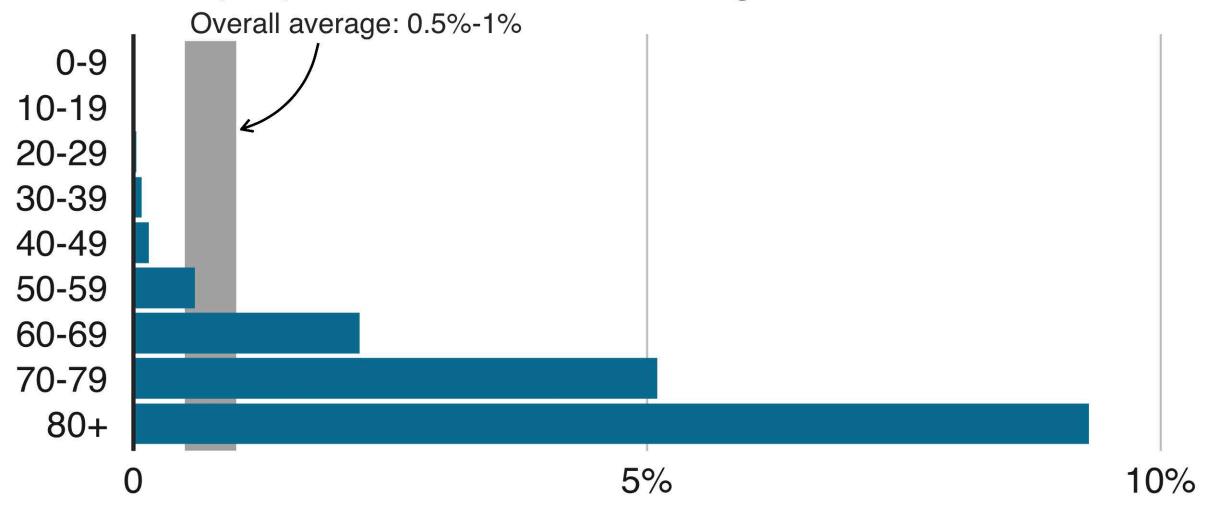
Case fatality rate (CFR) is calculated by dividing the total number of deaths from a disease by the number of confirmed cases. Data is based on early-stage analysis of the COVID-19 outbreak in China in the period up to February 11, 2020.



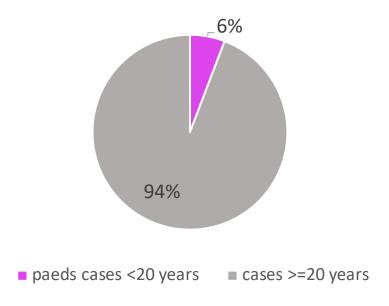
Data source: Novel Coronavirus Pneumonia Emergency Response Epidemiology Team. Vital surveillances: the epidemiological characteristics of an outbreak of 2019 novel coronavirus diseases (COVID-19)—China, 2020. China CDC Weekly.

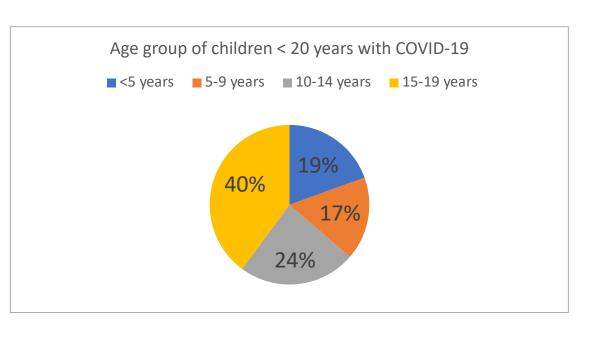
Death rates depend on age group

Estimated proportion of deaths among infections

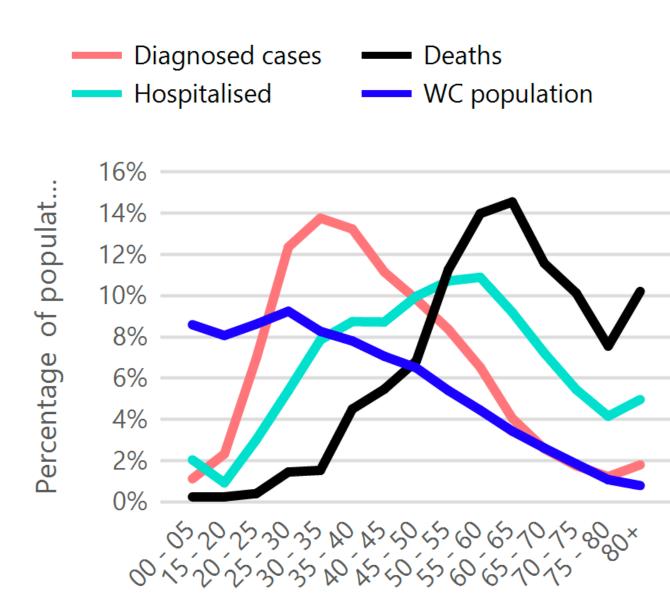


% paediatric cases of all COVID-19 cases

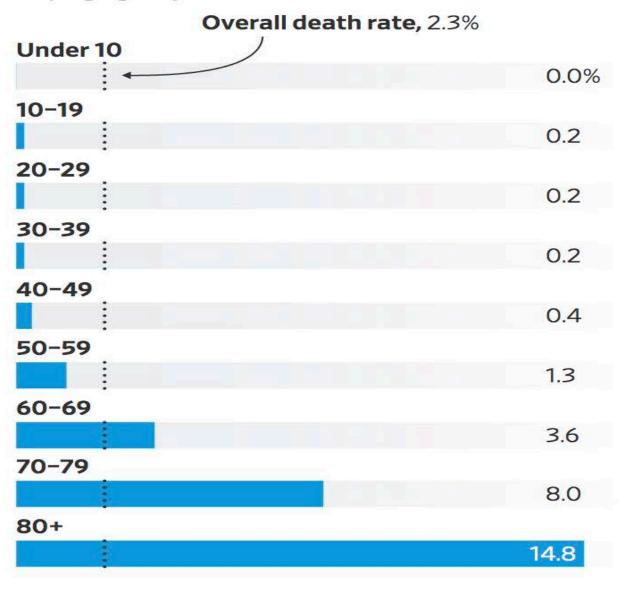




Ages by outcome



Death rate among diagnosed patients... ...by age group



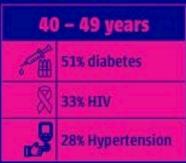
...and by underlying condition

Cardiovascular disease		
	10.5%	
Diabetes		
	7.3	
Chronic respiratory diseas	se	
	6.3	
Hypertension		
	6.0	
Cancer		
	5.6	
None		
	0.9	

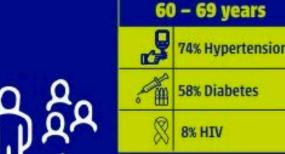
COVID-19 death analysis

Top three comorbidities and per age group:















Incidence of AKI

0.5-23%

Naicker S, et al. Kidney Int 2020; doi.org/10.1016/j.kint.2020.03.001



AKI and #COVID19

0.8-9%



Cheng Y, et al. Kidney Int 2020; doi.org/10.1016/j.kint.2020.03.005 Guan W, et al. NEJM 2020; doi:10.1056/NEJMoa2002032

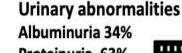
...........



More common in **ICU** setting

8.3% vs 2.0%

Wang D, et al. JAMA 2020; 323 (11): 1061-69



Proteinuria 63% Hematuria 26.7%

Both 44%

Naicker S, et al. Kidney Int 2020; doi.org/10.1016/j.kint.2020.03.001

Comorbidities

Arentz M. et al. JAMA 2020; doi:10.1001/jama.20204326 Chen H, et al. Lancet 2020; 395 (10226): 809-15 Cheng Y, et al. Kidney Int 2020; doi.org/10.1016/j.kint.2020.03.005 Guan W, et al. NEJM 2020; doi:10.1056/NEJMoa2002032 Huang C, et al. Lancet 2020; 395 (10223); 497-506



CKD 0.7-48%







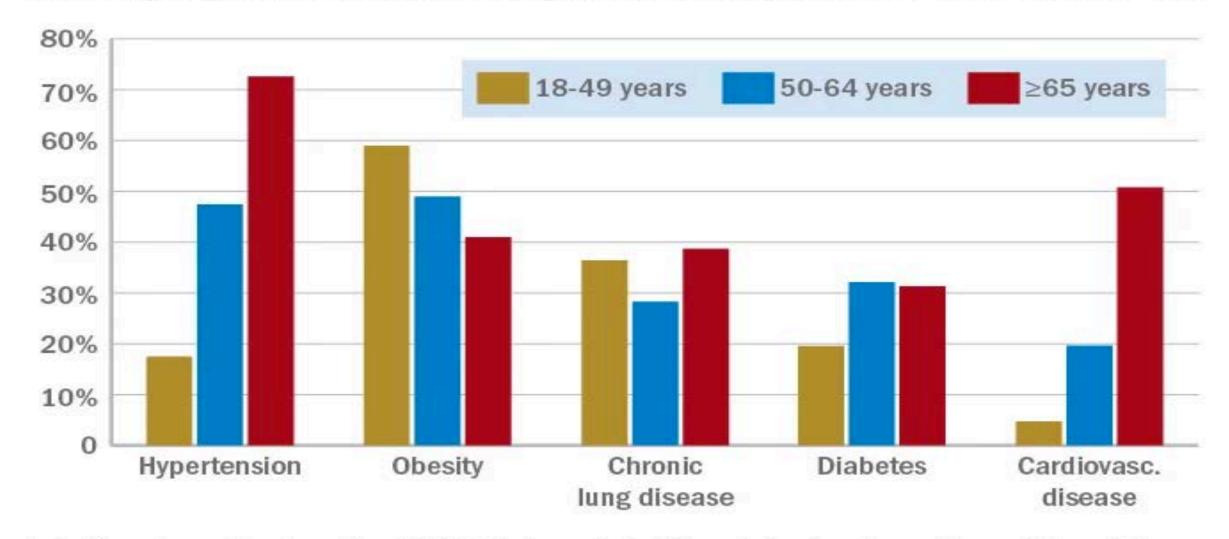
60 years

Rolando Claure-Del Granado, MD @Rclaure nefro Edgar V. Lerma, MD @edgarvlermamd





Underlying conditions among adults hospitalized with COVID-19



Note: Based on data from the COVID-19-Associated Hospitalization Surveillance Network for patients hospitalized in 99 counties in 14 states from March 1-30, 2020.

Source: MMWR. 2020 Apr 8:69(early release):1-7

40,000 infants are born in the US each year with CHD

3 MILLION
people living with
CHD in the US today



affecting 1 in 100 newborns



THERE IS NO CURE



< 10 PERCENT

of adults with CHD are receiving the care recommended



- Only 48 patients were collected from 46 participating units over a period of a month.
- 73% of these children had a respiratory illness and 40 of the 48 had underlying medical conditions.
- Only two of this cohort died during the period under review.
- 'Adult' risk factors such as obesity applied to these younger individuals as well.
- No data linking underlying CHD to increased risk of developing severe COVID-19.



- No evidence suggesting that CHD is expressed in larger numbers in children of mothers affected by SARS Co-V
 2.
- Pregnant women do not appear to be at higher risk for mortality with SARS Co-V 2 compared to previous infections such as SARS Co-V 1 or Flu.
- ACHD also not associated with increased mortality.
- Although arrythmias have been noted in adults, including heart block, no cases reported in children.

Coronavirus: Parents not taking sick children to hospital over COVID-19 fears, says leading doctor

Dr Sanjay Patel is worried that children with serious illnesses are not being seen as quickly as they normally would.



Emily Mee
News reporter @EmilyMeeSky

(1) Monday 13 April 2020 13:46, UK





Fewer children than expected are being brought in, Dr Patel says. File pic

Outside the hospital/family factors

- In the face of the pandemic, the greatest threat to child health is likely from the disruption of current health care systems.
- Reduced access to health care services: Poor availability and increased cost of transport coupled with reduced household incomes.
- Increased number of patients missing essential visits and filling of their prescriptions.
- CHD patients are at increased risk of severe disease from vaccine preventable disease outbreaks due to reduced immunisations.
- The reluctance of patients requiring urgent interventions to be admitted for fear of contracting COVID-19 infection in hospital.

In Memoriam: Healthcare Workers Who Have Died of COVID-19

April 01, 2020



Editor's note: Find the latest COVID-19 news and guidance in Medscape's Coronavirus Resource Center.

Updated June 19, 2020

Healthcare workers are on the front lines of the global effort to care for patients with COVID-19, while putting themselves at risk for infection. More than 1000 have already died, from dozens of countries, professions, and specialties. Here we honor them all.

Physicians, nurses, assistants, technicians, orderlies, administrators, volunteers, drivers, porters, EMTs, firefighters, and more — fresh on the job or retired — they are all remembered here. In some cases, we include names of people who did not die from COVID-19, but whose deaths were clearly related to the stress and demands of the pandemic.

This list is not yet complete, and we need your help to keep it up to date. Please submit names through this form with as much information as possible, including age, hospital or facility name, profession or specialty, location, and a link to source information. We rely on the links you include to verify each case. We are unfortunately unable to include names without confirmation of their death related to COVID-19.

To all who have submitted the names of colleagues, friends, and family members, we thank you for helping us remember them, and we mourn your loss. As of May 1, this list includes more than 1000 names from 64 countries.



The funeral of beloved local nurse Petronella "Aunty Nellie" Benjamin. Picture: Henk Kruger / African News Agency (ANA)

Western Cape MEC honours nurse who died from Covid-19 a day before she was to retire



- Postponement of elective clinic visits, surgery and cardiac catheterisations to reduce hospital and clinic volumes.
- Review/suspension of ECMO/Transplant programs.
- Reduced outreach programs/Surgery camps.
- Adult services prioritized.
- Reduced or curtailed funding for cardiac surgery programs.
- Teaching, training and information sharing.



El-Saedi et al JACC in press The Hidden Victims of COVID-19 Pandemic: CHD Patients

High-risk children

 High-risk cardiac children (complex defects, single ventricle), severe cyanosis, reduced cardiac function or heart failure, arrhythmias, pulmonary hypertension, heart surgery within the last three months or heart transplant patients should continue to be seen regularly.

Special care for all

- Cardiology services are still open albeit curtailed.
- Shortness of breath in children must be considered as a cardiac symptom not only COVID.
- Consider vaccination against the influenza virus and Palivizumab for respiratory syncytial virus in infants if available
- Discuss COVID status of patient PRIOR to referral to a tertiary centre.

Policy Brief Who should go back to school first?

Children under 10 are least susceptible to COVID-19, they should go back first.

8 May 2020



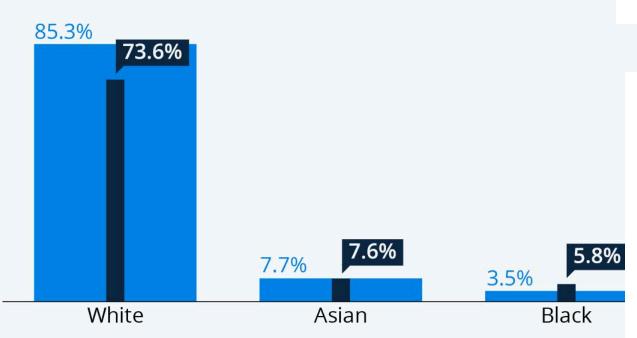
School: Who and when?

- This brief presents what appears to be a clear and emerging consensus in the international research literature across all countries:
- Children aged 0-10 years old are considerably less likely than adults to get infected, either from each other or from adults.
- They are less likely to transmit the virus, even when they are infected.
- It is extremely rare for them to get severely ill or die from COVID-19 however
- Each case and particularly high-risk children, the decision should be carefully considered and balanced with other needs.

England's ethnic Covid-19 deaths disparity

Share of population and share of Covid-19 deaths in England, by ethnicity*

■ Share of population ■ Share of deaths



* As of 17 April 2020 at 5pm. Population shares as of 2011 Census. 9.5% of Covid-19 deaths have no ethnicity information. Sources: NHS England, Office for National Statistics











The Poor and Marginalized Will Be the Hardest Hit by Coronavirus

We need to rethink our public health strategies before the next outbreak—even if the conversations are uncomfortable

By Sandro Galea on March 9, 2020

HEALTH

The other COVID-19 risk factors: How race, income, ZIP code can influence life and death

Liz Szabo and Hannah Recht Kaiser Health News

Published 4:43 p.m. ET Apr. 22, 2020 Updated 2:29 p.m. ET Apr. 25, 2020







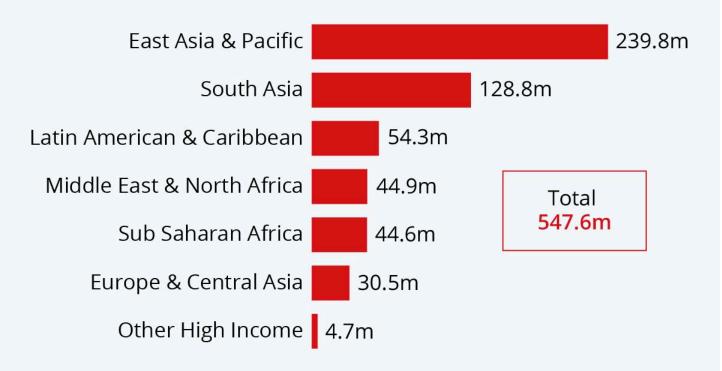
It started with a headache in late March. Then came the body aches.

At first, Shalondra Rollins' doctor thought it was the flu. By April 7, three days after she was finally diagnosed with COVID-19, the 38-year-old teaching assistant told her mom she was feeling winded. Within an hour, she was in an ambulance, conscious but struggling to breathe, bound for a hospital in Jackson, Mississippi.

An hour later, she was dead.

Covid-19 Could Push Half A Billion People Into Poverty

Additional people in poverty due to a 20% income drop caused by a Covid-19 recession*



^{*} Poverty level - people earning below \$5.50 per day Source: Oxfam





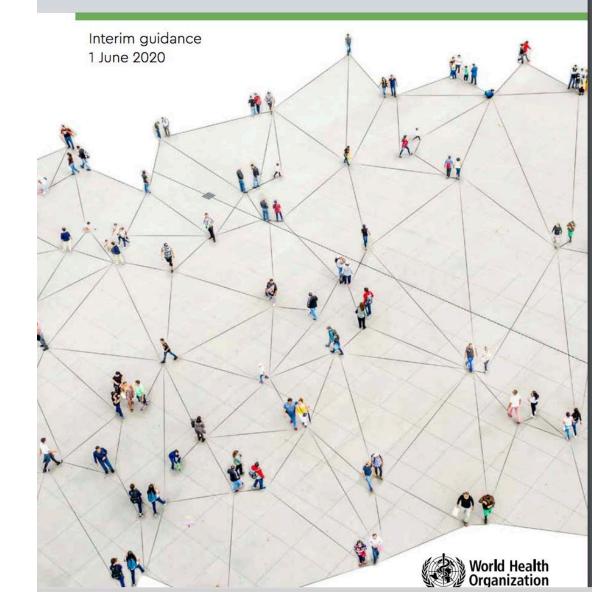






- Already affected by poverty, vulnerable health systems and poor access to tertiary medical and surgical interventions.
- Most likely to encounter interruptions in secondary prophylaxis, access to care and ongoing medical care.
- This includes INR tests and family planning.
- Delays in Diagnostics, surgical and catheter-based intervention significant.
- The COVID-19 pandemic threatens progress in RHD research, advocacy, and country programs.

Maintaining essential health services: operational guidance for the COVID-19 context



What don't we know?

An outbreak of severe Kawasaki-like disease at the Italian epicentre of the SARS-CoV-2 epidemic: an observational cohort study

Lucio Verdoni, Angelo Mazza, Annalisa Gervasoni, Laura Martelli, Maurizio Ruggeri, Matteo Ciuffreda, Ezio Bonanomi, Lorenzo D'Antiga

Summary

Background The Bergamo province, which is extensively affected by the severe acute respiratory synd coronavirus 2 (SARS-CoV-2) epidemic, is a natural observatory of virus manifestations in the general population the past month we recorded an outbreak of Kawasaki disease; we aimed to evaluate incidence and features of pa with Kawasaki-like disease diagnosed during the SARS-CoV-2 epidemic.

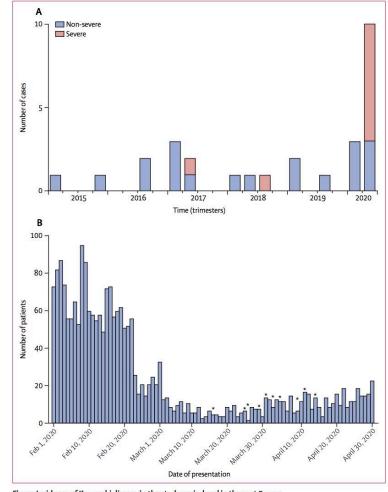


Figure: Incidence of Kawasaki disease in the study period and in the past 5 years

(A) Frequency of Kawasaki disease at the paediatric emergency department of Hospital Papa Giovanni XXIII of Bergamo, Italy, in the past 5 years, by case severity. (B) Number of patients presenting to the paediatric



COVID-19 children: 'Kawasaki-like' disease, what we know so far

Heads up from WHO, CDC as doctors stumped by illness in children with links to SARS-CoV-2 $\,$

Published: June 21, 2020 14:29

Jay Hilotin, Assistant Editor









The Multi-System Inflammatory Syndrome in Children (MISC), similar to 'Kawasaki Disease', is presenting in children who have recovered from COVID-19, or been exposed to people suffering from COVID-19. MISC is now believed to have impacted approximately 300 US children. The number of could be higher, if cases in Italy, Britain and elsewhere were to be accounted for.

Image Credit: https://bit.lv/2YihmxA

What don't we know?

- Multisystem inflammatory syndrome in children (MIS-C)
- Paediatric inflammatory multisystem syndrome temporally associated with SARS-COV-2 (PIMS-TS)
- Paediatric COVID-associated Multi-system Inflammatory Syndrome (PMIS)
- Presentation includes fever, hypotension, cardiac dysfunction, high CRP, skin rash and joint pain.



What don't we know?

- In countries where RHD is endemic, there may be some diagnostic overlap between SARS-CoV 2 infection and new or recurrent ARF, which can present with fever, joint pain and sore throat.
- Diagnosis of bacterial infection, viral infection, TB, RHD, malaria and SARS-CoV 2 especially with inflammatory markers becomes problematic.

SPECIAL ARTICLE

Coronavirus Infections in Children Including COVID-19

An Overview of the Epidemiology, Clinical Features, Diagnosis, Treatment and Prevention Options in Children

Petra Zimmermann, MD, PhD*,†,‡ and Nigel Curtis, FRCPCH, PhD†,‡,\$

Journal of Microbiology, Immunology and Infection (2020) 53, 436-443



Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.e-jmii.com



Review Article

Treatment options for COVID-19: The reality and challenges



Shio-Shin Jean a,b, Ping-Ing Lee c, Po-Ren Hsueh d,e,*

- ^a Department of Emergency, School of Medicine, College of Medicine, Taipei Medical University, Taipei. Taiwan
- Department of Emergency Medicine, Department of Emergency and Critical Care Medicine, Wan Fang Hospital, Taipei Medical University, Taipei, Taiwan
- ^c Department of Pediatrics, National Taiwan University Children's Hospital, National Taiwan University College of Medicine, Taipei, Taiwan
- ^d Department of Laboratory Medicine, National Taiwan University Hospital, National Taiwan University College of Medicine, Taipei, Taiwan
- ^e Department of Internal Medicine, National Taiwan University Hospital, National Taiwan University College of Medicine, Taipei, Taiwan



Mkhize explains how the coronavirus 'breakthrough' drug will be used in South Africa

Staff Writer 22 June 2020





OME CORONAVIRUS

POLITICS

BUSINESS

IN DEPTH

HARMA WARS

Coronavirus: Calls for free COVID-19 vaccine ahead of WHO assembly



This article is part of the dossier: **Corona Chronicles:** 10 May – 15 May

By Patrick Smith
Posted on Friday, 15 May 2020 18:31



Tedros Adhanom Ghebreyesus, Director General of the World Health Organization (WHO), gives a statement to the media about the response to the COVID-19 virus outbreak, at the World Health Organization (WHO) headquarters in Geneva, Switzerland, Wednesday, Feb. 12, 2020. (Salvatore Di Nolfi/Keystone via AP)



infants are born in the US each year with CHD CHD is the affecting 1 in 100 in the US today CHD is the affecting 1 in 100 in the US today CHD in the US today CHD in the US today CHD in the US today Cause of birth defect related deaths THERE IS NO CURE 3-4 x 56 BILLION CHD in the US today Cause of birth defect related deaths THERE IS NO CURE 3-4 x 56 BILLION Costs for CHD patients Costs for CHD patients

What would we like to know?

CHD

- Epidemiology
- Adult-Risk Factors
- Effect of opening Schools
- Treatments
- Vaccines trials
- Outcomes of surgery in patients testing positive

RHD

- Epidemiology
- Adult-Risk Factors
- Diagnostics
- Sore throat and GAS post COVID
- Surgery
- Vaccine trials in remote settings









How to answer these questions?

- Findings from large multi-national registries, biorepositories and observational studies.
- RCTs into treatment options for children
- Qualitative research on indirect effects of COVID-19
- Economical modelling of direct and indirect effects on children
- Implementation and behavioural change modelling
- Remote learning, food sustainability and disaster management



In summary

Coronavirus 2 (SARS-CoV-2) the causative agent of what we now know as 'Coronavirus Disease 2019' (COVID-19), is the most serious global health crisis of our generation, with significant and far-reaching impact upon health, economy, social cohesion and emotional and mental wellbeing.

Although children do not bear the brunt of direct mortality, they are significantly affected in terms of morbidity, difficulty in access to and interruption to continuity and complexity of care, as well as the indirect social and financial effects impacting their health outcomes.

CHD and RHD patients will be affected directly and indirectly, with much still to learn.



What have we learnt about ourselves?

- Zoom Teams Slack Webinars
- Collaboration- multi-centre work
- Better links to adult medicine
- Links to schools, community and the socio-economic context of health and health systems.
- The importance of wellbeing and social connection in a time of physical distancing.
- Dramatically affected practice
- Innovation and creativity
- A new way of caring?

