

# بیماری کووید-19 در کودکان

دکتر رکسانا منصور قناعی

فوق تخصص عفونی اطفال

دانشیار دانشگاه علوم پزشکی شهید بهشتی



# 2019-nCoV

Respiratory illness caused by a novel (new) coronavirus (named "2019-nCoV")

Cluster of cases of pneumonia reported in Wuhan on 31 Dec 2019, with 1st case symptomatic on 8 Dec

Initial cases associated with a market in Wuhan

Initial origin was probably zoonotic but Human-human transmission,

Rapid spread within Wuhan and to many other Chinese provinces and other countries

Most of them associated with travel from Wuhan, also are being reported in a growing number of [international locations](#) ( 20<sup>th</sup> Jan)

World Health Organization (WHO) Director-General declared that the 2019-nCoV outbreak constitutes a Public Health Emergency of International Concern( 30<sup>th</sup> Jan)

Number of cases is increasing rapidly, most patients have mild illness, presenting with fever, cough, fatigue & myalgia.



# SARS

Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003.

# MERS

It was first reported in Saudi Arabia in 2012 and has since spread to several other countries, including the United States. Most people infected with MERS-CoV developed severe respiratory illness, including fever, cough, and shortness of breath. Many of them have died.



# منبع و انتشار ویروس

Early on, many of the patients in the outbreak of respiratory illness caused by 2019-nCoV in Wuhan, China had some link to a **large seafood and live animal market**, suggesting animal-to-person spread.

Later, a growing number of patients reportedly did not have exposure to animal markets, indicating person-to-person spread.

# منبع و انتشار ویروس

SARS, civet cats, while MERS came from camels

2019-nCoV is more genetically

related to **SARS** than MERS

99% identity to virus in Pangolin

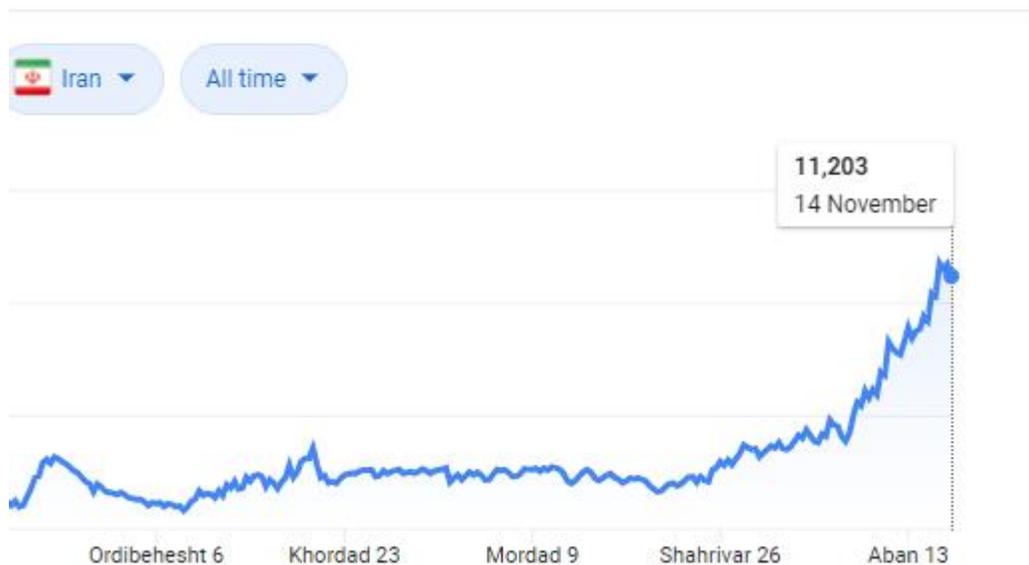
85% to bats viruses

60% identity between different corona





# امار



## Cases Overview

 Iran

Total cases

**762K**

+11,203

Recovered

**559K**

Deaths

**41,493**

+452

 Worldwide

Total cases

**54M**

Recovered

**34.8M**

Deaths

**1.31M**



[More locations and statistics](#)

Globally, as of 3:05pm CEST, 20 October 2020, there have been **54m** confirmed cases of COVID-19, including **1.31 m** deaths, reported to WHO.

## انتقال

Most frequent method of transmission of coronavirus from person to person is **droplet** transmission.

If the sick person coughs or sneezes, the virus can be carried in saliva droplets to people nearby, infecting them.



- **NOT likely airborne** (recent concern?)
- **Droplets**
  - Via close contact with an infected person
- **Contaminated working surfaces** (e.g. fomites, stainless steel, doorknobs)
  - ~ survival up to 6 hours

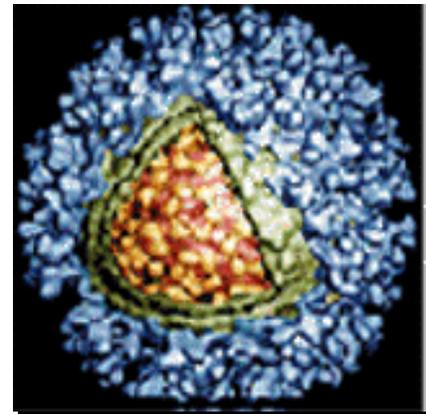


Most often, spread from person-to-person happens among close contacts (about 2m).

Typically, with most respiratory viruses, people are thought to be most contagious when they are most symptomatic (the sickest).

## • بقای ویروس در سطوح

- - 6 days in suspension
  - 3-7 h after drying on surfaces
- up to 72 hours on plastic and stainless steel,
- up to four hours on copper, and up to 24 hours on cardboard.
- In dry conditions, the virus crystallizes, and can float in the air like dust.
- It is suspected that the SARS virus can be transmitted in this manner.

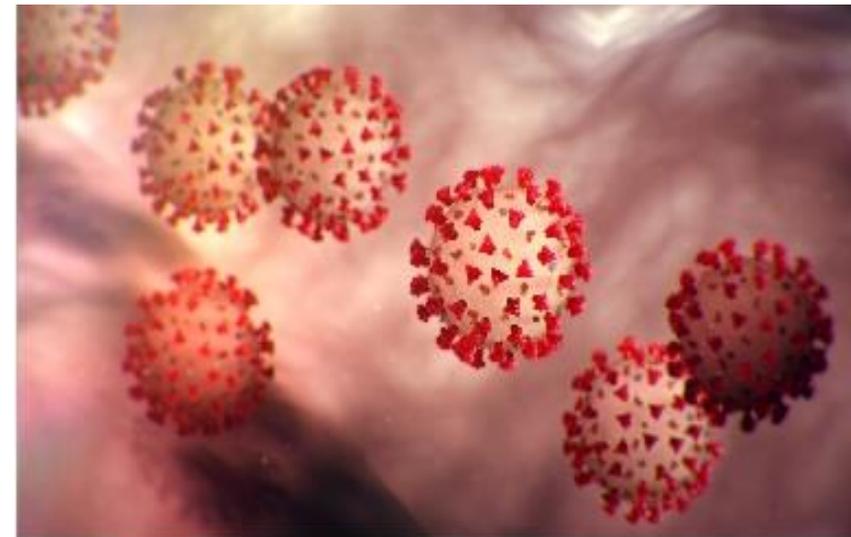


# دوره نهفتگی

The incubation period for children is the same as in adults. The time between exposure to COVID-19 and when symptoms start is commonly around **5 to 6 days, and ranges from 1 to 14 days**

One study reported that 97.5% of persons with COVID-19 who develop symptoms will do so within 11.5 days of SARS-CoV-2 infection.

- some infected persons can be contagious, from **1–3 days** before symptom onset



# آیا کودکان و نوجوانان مبتلا به کرونا می شوند؟

fewer children compared to adults,

- can be infected
- can causes COVID-19, and get sick from COVID-19
- can spread the virus that causes COVID-19 to others.
- Children, like adults, who have COVID-19 but have no symptoms ("asymptomatic") can still spread the virus to others



# ایا کودکان در ریسک کمتری هستند؟

Children under the age of 18 years

represent about 8.5% of reported cases,

usually mild disease

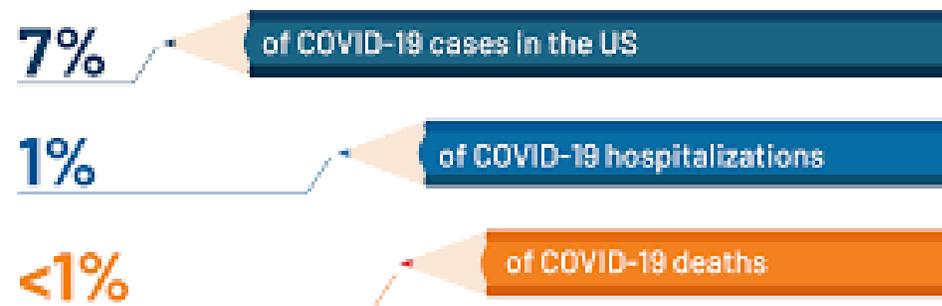
relatively few deaths compared to other age groups.

cases of critical illness have been reported.

As with adults, pre-existing medical conditions have been suggested as a risk factor for severe disease and intensive care admission in children.

## What Do We Know About Children and Coronavirus Transmission?

As of late July, children under the age of 18 account for:



# علايم در کودکان چيست؟

Most children have mild symptoms or have no symptoms

Some children can get severely ill

might require hospitalization, intensive care, or a ventilator to help them breathe.

In rare cases, they might die.

MISC/ shock/

severe illness from COVID-19:

- Babies under 1 year old and
- children with certain underlying conditions

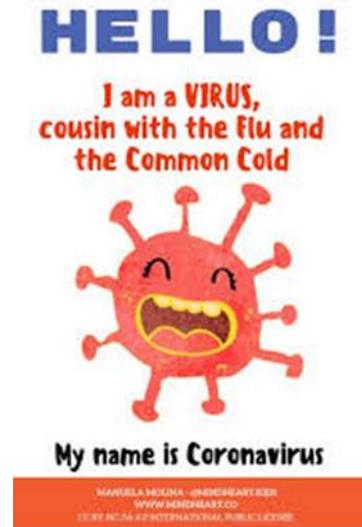


# علايم شايع در كودكان چيست؟

The most common symptoms of  
COVID-19 in children are

fever and cough

like other common illnesses, like colds,  
strep throat, or allergies



# چه بیماری‌های زمینه‌ای خطر ابتلا به کرونا را افزایش می‌دهد؟

Asthma or chronic lung disease

Diabetes

Genetic, neurologic, or metabolic conditions

Heart disease since birth

Immunosuppression (weakened immune system due to certain medical conditions or being on medications that weaken the immune system)

Medical complexity (children with multiple chronic conditions that affect many parts of the body who are often dependent on technology and other significant supports for daily life)

Obesity

# علايم

Nasal congestion or runny nose

New loss of taste or smell

Sore throat

Diarrhea

Nausea or vomiting

Stomachache

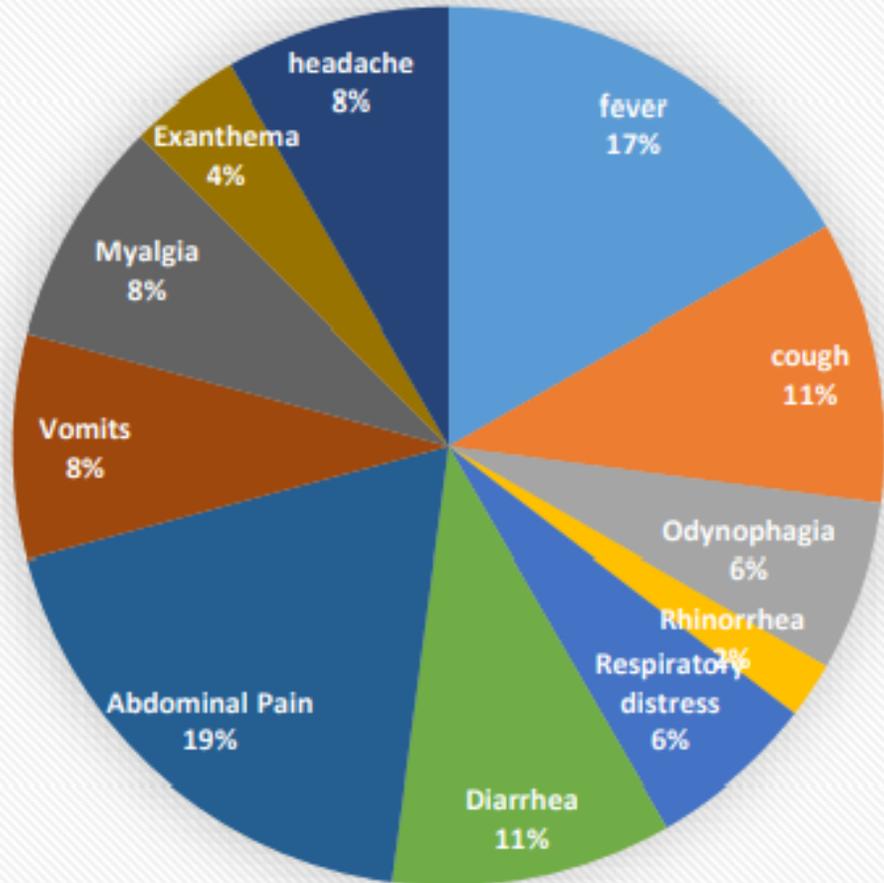
Tiredness

Headache

Muscle or body aches

Shortness of breath or difficulty breathing

Poor appetite or poor feeding, especially in babies under 1 year old



Cough	163 (41.5%)
Pneumonia	145 (36.9%)
Pharyngeal erythema	81 (20.6%)
Tachycardia on admission	73 (18.6%)
Tachypnea on admission	53 (13.4%)
Nasal symptoms	44 (11.2%)
Upper airway infections	43 (10.9%)
Diarrhea	32 (8.1%)
Nausea/Vomiting	28 (7.1%)
Fatigue	20 (5.0%)
Respiratory distress	14 (3.5%)
Sore throat	10 (2.5%)
Respiratory failure	7 (1.8%)
Creptations	6 (1.5%)
Sputum	6 (1.5%)
Hypoxemia	5 (1.3%)

جدول 1- سیستم نمره دهی در مرحله پیش از بیمارستان

Predictors	Predictive factor	Cut off	Score
Host factors	Age	< 5	1
Clinical manifestations	Pulse Rate (Considering fever or dehydration)	Tachycardia according to age*	2
	Respiratory Rate	Tachypnea according to COVID algorithm in children**	2
	Temperature	> 38.5 > 38.5 for > 5 days	1 2
Co- morbidities	Obesity	body mass index $\geq$ 40	2
		body mass index= 30-40	1
	Diabetes mellitus	Uncontrolled	2
		Controlled	1
	cardiovascular disease		2
	Cerebrovascular disease		1
	Chronic liver disease		1
	Hypertension	Uncontrolled	2
		Controlled	1
	Chronic lung disease	Chronic obstructive pulmonary disease	2
		Others (uncontrolled asthma, Pulmonary fibrosis)	1
	Immune deficiency	Bone marrow or solid organ transplant	2
		Other immunodeficiencies (HIV (CD4< 200 OR 15%), use of corticosteroids or other immunosuppressing agents)	1
	Cancer	Under chemotherapy	2
		In remission	1
	Hemoglobinopathy	Sickle cell disease	2
Other hemoglobinopathies		1	
Chronic kidney disease		1	

Predictors	Predictive factor	Cut off	Score
Lab Tests	Lymphopenia	According to COVID-19 algorithm in children*	2
	LDH** or	>500	2
		245-500	1
	CRP	>70mg/L	2
		40-70mg/L	1

\* تاکی کاردی: میانگین از تعداد ضربان قلب بیش از 180 در دقیقه در سن زیر 2 سال، بیش از 160 در سن 2-5 سال، بیش از 120 برای سن 6-12 سال، و بیشتر از 100 برای سن بالای 12 سال.

# MISC-19, multisystem inflammatory disease



# MISC

Early in the pandemic, it appeared that children and adolescents were [less likely](#) than adults to be infected with SARS-CoV-2 and, if infected, most had mild to moderate illness.

Then, MIS-C cases began to appear in children and adolescents weeks after they had COVID-19, and sometimes when a child or teen had no known prior SARS-CoV-2 infection.

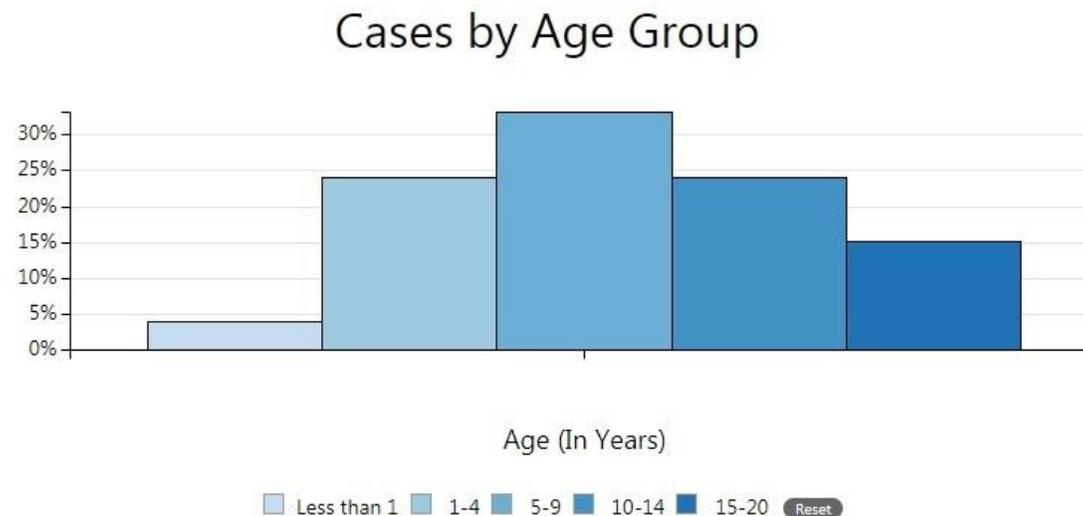
Current data indicate the average age of children with MIS-C is 8 years.

# What is MIS-C?

Multisystem inflammatory syndrome in children (MIS-C) is a condition where different body parts can become inflamed, including the heart, lungs, kidneys, brain, skin, eyes, or gastrointestinal organs. Children with MIS-C may have a fever and various symptoms, including abdominal (gut) pain, vomiting, diarrhea, neck pain, rash, bloodshot eyes, or feeling extra tired

# MISC

- Most cases are in children and adolescents between the ages of 1 and 14 years, with an average age of 8 years.
- Cases have occurred in children and adolescents from <1 year old to 20 years old.
- More than 75% of reported cases have occurred in children who are Hispanic or Latino (412 cases) or Black, Non-Hispanic (369 cases).
- 98% of cases (1,145) tested positive for SARS CoV-2, the virus that causes COVID-19. The remaining 2% were around someone with COVID-19.
- Most children developed MIS-C 2-4 weeks after infection with SARS-CoV-2.
- Slightly more than half (56%) of reported cases were male



# Case Definition (MIS-C)

- An individual aged <21 years presenting with fever<sup>i</sup>, laboratory evidence of inflammation<sup>ii</sup>, and evidence of clinically severe illness requiring hospitalization, with multisystem ( $\geq 2$ ) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological);  
AND

- No alternative plausible diagnoses; AND

- Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or COVID-19 exposure within the 4 weeks prior to the onset of symptoms

<sup>i</sup>Fever  $>38.0^{\circ}\text{C}$  for  $\geq 24$  hours, or report of subjective fever lasting  $\geq 24$  hours

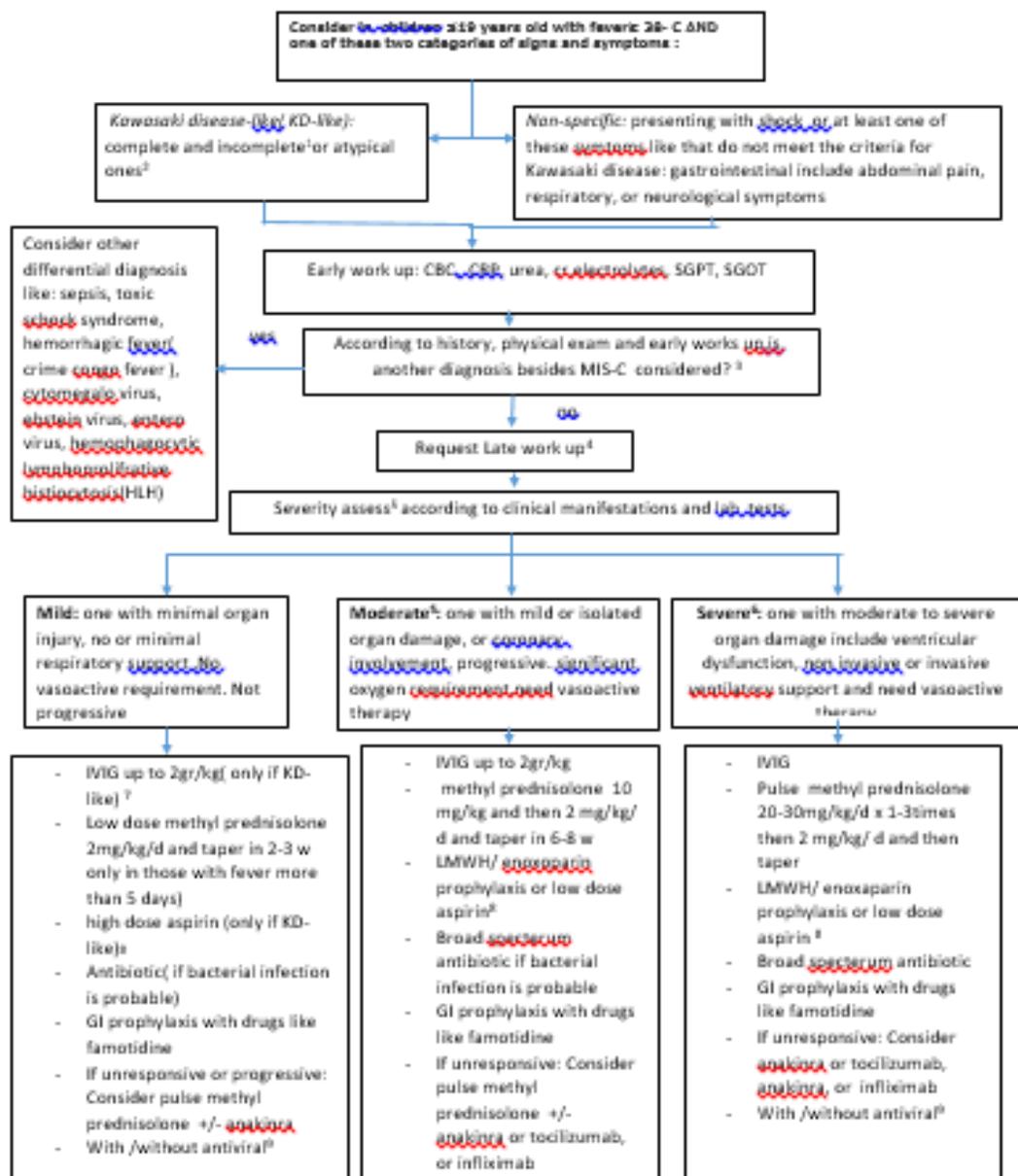
<sup>ii</sup>Including, but not limited to, one or more of the following: an elevated C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), fibrinogen, procalcitonin, d-dimer, ferritin, lactic acid dehydrogenase (LDH), or interleukin 6 (IL-6), elevated neutrophils, reduced lymphocytes and low albumin

Additional comments

- Some individuals may fulfill full or partial criteria for Kawasaki disease but should be reported if they meet the case definition for MIS-C

- Consider MIS-C in any pediatric death with evidence of SARS-CoV-2 infection

Management of child with suspected Multi-inflammatory syndrome-Covid 19( MIS-C)



## عفونت مجدد

After COVID-19 , low levels of virus for up to 3 months

a positive test result, not spreading COVID-19.

If has recovered from COVID-19 and has new symptoms of COVID-19 should consider:

Re-evaluation for reinfection, especially if the person has had close contact,

possible retest

should be isolated

# اگر کودک در تماس با فرد مبتلا قرار گرفت چکار کنیم؟

Monitor your child for COVID-19 symptoms every day till 14 d,

Keep her at home and Pay particular attention:

- Fever (temperature 37.8 C or higher)
- Sore throat
- New uncontrolled cough that causes difficulty breathing (for a child with chronic allergic/asthmatic cough, see if there is a change from their usual cough)
- Diarrhea, vomiting, or stomachache
- New onset of severe headache, especially with a fever



# اگر کودک علامت دارد و در تماس مشکوک بوده است؟

- Keep the child home
- Call child's healthcare provider to discuss whether your child needs to be evaluated or tested for COVID-19.
- [Protect others from COVID-19 while caring for your child](#)
- Notify child's school that your child is sick. Also inform the school if child has had a COVID-19 test and what the result is, if available.



# خروج از ایزوله در موارد تماس

close contact

should stay home for 14 days **after their last exposure** to that person.

However, anyone who has had close contact with someone with COVID-19 and who meets the following criteria does **NOT** need to stay home.

- Has COVID-19 illness within the previous 3 months **and**
- Has recovered **and**
- Remains without COVID-19 symptoms (for example, cough, shortness of breath)

# خروج از ایزوله در فرد بی علامت و تست مثبت

If you continue to have no symptoms, you can be with others after 10 days have passed since you had a positive viral test for COVID-19.

Most people do not require testing



# خروج از ایزوله در موارد با علامت

- 10 days since symptoms first appeared **and**
- 24 hours with no fever without the use of fever-reducing medications **and**
- Other symptoms of COVID-19 are improving\*

*\*Loss of taste and smell may persist for weeks or months after recovery and need not delay the end of isolation*

Most people do not require testing to decide when they can be around others;

Note that these recommendations **do not** apply to persons with severe COVID-19 or with severely weakened immune systems (immunocompromised).

# خروج از ایزوله در فرد با علایم شدید

People who are severely ill with COVID-19 might need to stay home longer than 10 days and up to 20 days after symptoms first appeared.

[Persons who are severely immunocompromised](#) may require testing to determine when they can be around others.



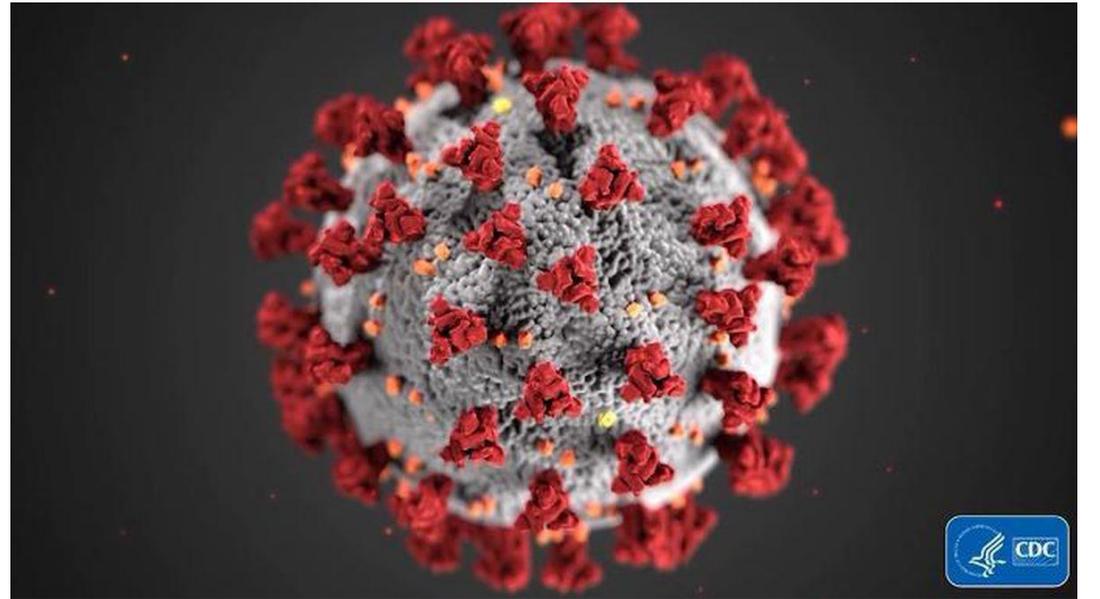
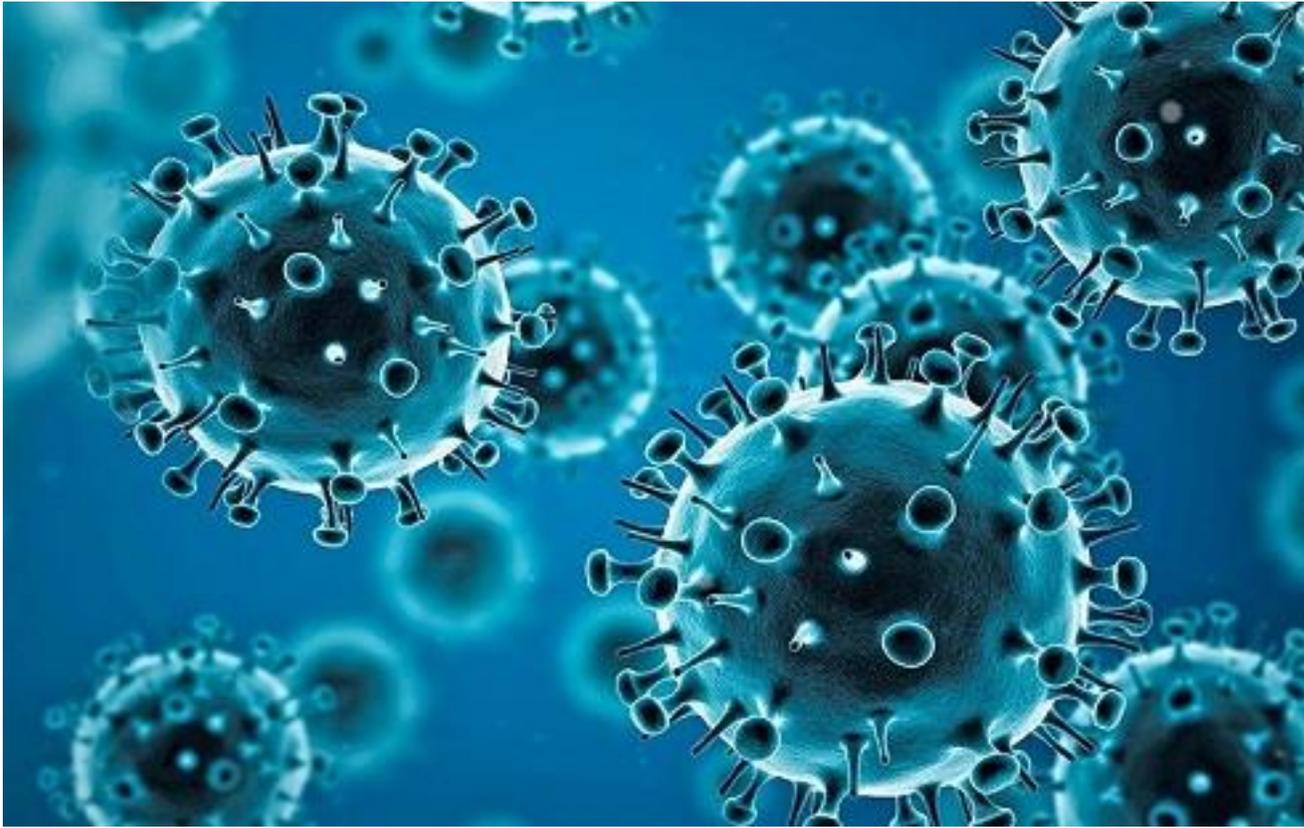
# ایا کودکان به بزرگسالان انتقال می دهند؟

**few outbreaks** involving children or schools have been reported.

milder illness and fewer symptoms, cases may sometimes go unnoticed. Importantly, early data from studies suggest that infection rates among teenagers may be higher than in younger children.

the longer-term effects of keeping schools open on community transmission are yet to be evaluated.





# تماس نزدیک به چه معنی است؟

being within approximately 2meters, or within the room or care area, of case for a prolonged period of time while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, disposable N95 respirator, eye protection)

person who caring for, living with, visiting, or sharing a health care waiting area or room with a novel coronavirus case

having direct contact with infectious secretions (e.g., being coughed on) while not wearing recommended personal protective equipment.

# انواع ماسک

Fabric masks are recommended to prevent onward transmission in the general population in public areas, particularly where distancing is not possible, and in areas of community transmission.

This could include the school grounds in some situations. Masks may help to protect others, because wearers may be infected before symptoms of illness appear. The policy on wearing a mask or face covering should be in line with national or local guidelines. Where used, [masks](#) should be worn, cared for and disposed of properly.

**The use of masks by children and adolescents in schools should only be considered as one part of a strategy to limit the spread of COVID-19.**

# ماسک در کودکان زیر 5 سال

Children aged **5 years and under**

should not be required to wear masks.

This is based on the safety and overall interest of the child and the capacity to appropriately use a mask with minimal assistance.

# کودکان چه ماسکی باید بپوشند؟

Children who are in general good health can wear a **non-medical or fabric mask**. Not transmitted to others if they are infected



correct size and sufficiently covers the nose, mouth and chin of the child.

Children with underlying health conditions such as cystic fibrosis, cancer or immunosuppression, should, in consultation with their medical providers, wear a **medical mask**. A medical mask controls spreading of the virus and protection to the wearer, and is recommended for anyone who is at higher risk of getting seriously ill from COVID-19.

## ایا در هنگام ورزش ماسک بپوشند؟

Children **should not** wear a mask when playing sports or doing physical activities, such as running, jumping or playing on the playground, so that it doesn't compromise their breathing.

When organizing these activities for children, it is important to encourage all other critical public health measures: maintaining at least a 1-metre distance from others, limiting the number of children playing together, providing access to hand hygiene facilities and encouraging their use.

## محافظة صورت ایا جای ماسک است

In the context of COVID-19, some children may not be able to wear a mask due to disabilities or specific situations such as speech classes where the teacher needs to see their mouths. In these cases, face shields may be considered an alternative to masks, but they do not provide the equivalent protection in keeping the virus from being transmitted to others.



# چگونه از ماسک استفاده کنند



Children should follow the same principles as adults for

wearing masks. This includes

cleaning hands at least 20 seconds if using an alcohol-based hand rub, or at least 40 seconds if using soap and water, before putting on the mask.

Make sure the mask is the right size to cover the nose, mouth and chin.

Children should be taught how to wear the mask properly, including not touching the front of the mask and not pulling it under the chin or into their mouth.

They should store the mask in a bag or container,

and not share the mask with others





# Prevention



# prevention

There is **currently no vaccine** to prevent 2019-nCoV infection.

The best way to prevent infection is to avoid being exposed to this virus., including:

Avoid close contact with people who are sick.

Stay home when you are sick.

Cover your cough or sneeze with a tissue, then throw the tissue in the trash.

Clean and disinfect frequently touched objects and surfaces using a regular household cleaning spray or wipe.



# prevention

Wash your hands often with soap and water for at least 20 seconds, especially after going to the bathroom; before eating; and after blowing your nose, coughing, or sneezing.

- If soap and water are not readily available, use an alcohol-based hand sanitizer with at least 60% alcohol. Always wash hands with soap and water if hands are visibly dirty.



# prevention

Before putting on a mask, wash hands with alcohol-based hand rub or soap and water

Cover mouth and nose with mask and make sure there are no gaps between your face and the mask

Avoid touching the mask while using it; if you do, clean your hands with alcohol-based hand rub or soap and water

Replace the mask with a new one as soon as it is damp and do not re-use single-use masks

To remove the mask: remove it from behind (do not touch the front of mask); discard immediately in a closed bin; wash hands with alcohol-based hand rub or soap and water

# prevention

Maintain social distancing – maintain at least 2m distance between yourself and other people, particularly those who are coughing, sneezing and have a fever.

No kissing, no shaking hands, No hugging



# prevention

Avoid touching eyes, nose and mouth

If you have fever, cough and difficulty breathing,

seek medical care early. if you have been in close contact with someone with who has respiratory symptoms.

Isolate yourself

Test according to your health care



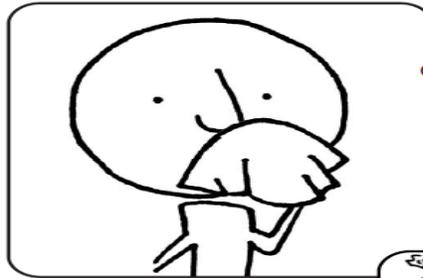
# prevention

To protect yourself, when visiting live animal markets, avoid direct unprotected contact with live animals and surfaces in contact with animals.

The consumption of raw or undercooked animal products should be avoided. Raw meat, milk or animal organs should be handled with care, to avoid cross-contamination with uncooked foods, as per good food safety practices

Stop the spread of germs that make you and others sick!

# Cover your Cough



Cover your mouth  
and nose with a  
tissue when you  
cough or sneeze  
or  
cough or sneeze into  
your upper sleeve,  
not your hands.

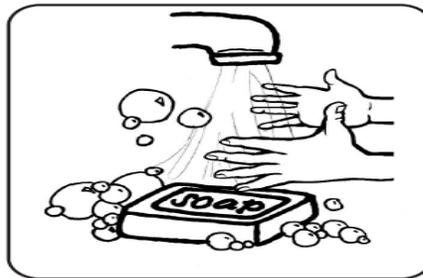


Put your used tissue in  
the waste basket.



# Clean your Hands

after coughing or sneezing.



Wash hands  
with soap and  
warm water

or  
clean with  
alcohol-based  
hand cleaner.

