



# **Atmospheric Pollution & Climate Change (APCC) Environmental Information System (ENVIS) Resource Partner**

(Sponsored by Ministry of Environment, Forest & Climate Change, Govt. of India)



## **Compendium of Extreme Weather & Air Pollution Events**

Image by NASA

**Global & National**

**2020-21**

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Indian Institute of Tropical Meteorology (IITM), Pune is a Resource Partner to Environmental Information System (ENVIS) on thematic area of Atmospheric Pollution & Climate Change (APCC). IITM-ENVIS works on generating knowledge products and spreading awareness through various activities, as a part of this we compiled the Extreme Events that occurred every year. The Extreme Weather, Air Pollution and Covid 19 pandemic events which occurred in the year 2020 are compiled in this publication. This book has short descriptions of such events with respect to region affected and magnitude of the events. We have tried to cover the major episodes of such events from around the world and classify into categories which are simple to understand and easy to refer.

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## EXTREME WEATHER EVENTS – NATIONAL

### 1. Heat Wave

Global temperatures and the frequency and intensity of heatwaves will rise in the 21st century as a result of climate change. High air temperatures can affect human health and lead to additional deaths. In India Heat waves typically occur from March to June, and in some rare cases, even extend till July. On an average, five-six heat wave events occur every year over the northern parts of the country. Single events can last weeks, occur consecutively, and can impact large population. Heat wave is considered if maximum temperature of a station reaches at least 40°C or more for Plains and at least 30°C or more for Hilly regions.



### Heat Waves and Health

The scale and nature of the health impacts of heat depend on the timing, intensity and duration of a temperature event, the level of acclimatization, and the adaptability of the local population, infrastructure and institutions to the prevailing climate. The precise threshold at which temperature represents a hazardous condition varies by region, other factors such as humidity and wind, local levels of human acclimatization and preparedness for heat conditions. The negative health impacts of heat are predictable and largely preventable with specific public health actions. Exposure to excessive heat has wide ranging physiological impacts for all humans, often amplifying existing conditions and resulting in premature death and disability.

### Some key health impacts of heat are:

- Rapid rises in heat gain due to exposure to hotter than average conditions compromises the body's ability to regulate temperature and can result in a cascade of illnesses, including heat cramps, heat exhaustion, heatstroke, and hyperthermia.

- Deaths and hospitalizations from heat can occur extremely rapidly (same day), or have a lagged effect (several days later) and result in accelerating death or illness in the already frail, particularly observed in the first days of heatwaves. Even small differences from seasonal average temperatures are associated with increased illness and death. Temperature extremes can also worsen chronic conditions, including cardiovascular, respiratory, and cerebrovascular disease and diabetes-related conditions.
- Heat also has important indirect health effects. Heat conditions can alter human behavior, the transmission of diseases, health service delivery, air quality, and critical social infrastructure such as energy, transport, and water.

## **1.1 Blistering heat wave to grip India as nationwide lockdown persists**

**Source:** [accuweather.com](https://www.accuweather.com), 9 April, 2020

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The mercury is on the rise across India, as the nation braces for its first heat wave of 2020 while it remains under a lockdown due to the COVID-19 pandemic.

The nationwide lockdown in India, known as the world's biggest, was extended until May 3 on Tuesday.

A northward shift in the jet stream will allow the storm track to remain well to the north. This will allow spring sunshine to continue this week across northern and central India, as well as into parts of Pakistan.

"Reaching a stretch of several days at or above 38 C (100 F) this early in the month is not unheard of, but it's a bit ahead of schedule," said AccuWeather Senior Meteorologist Dave Houk.

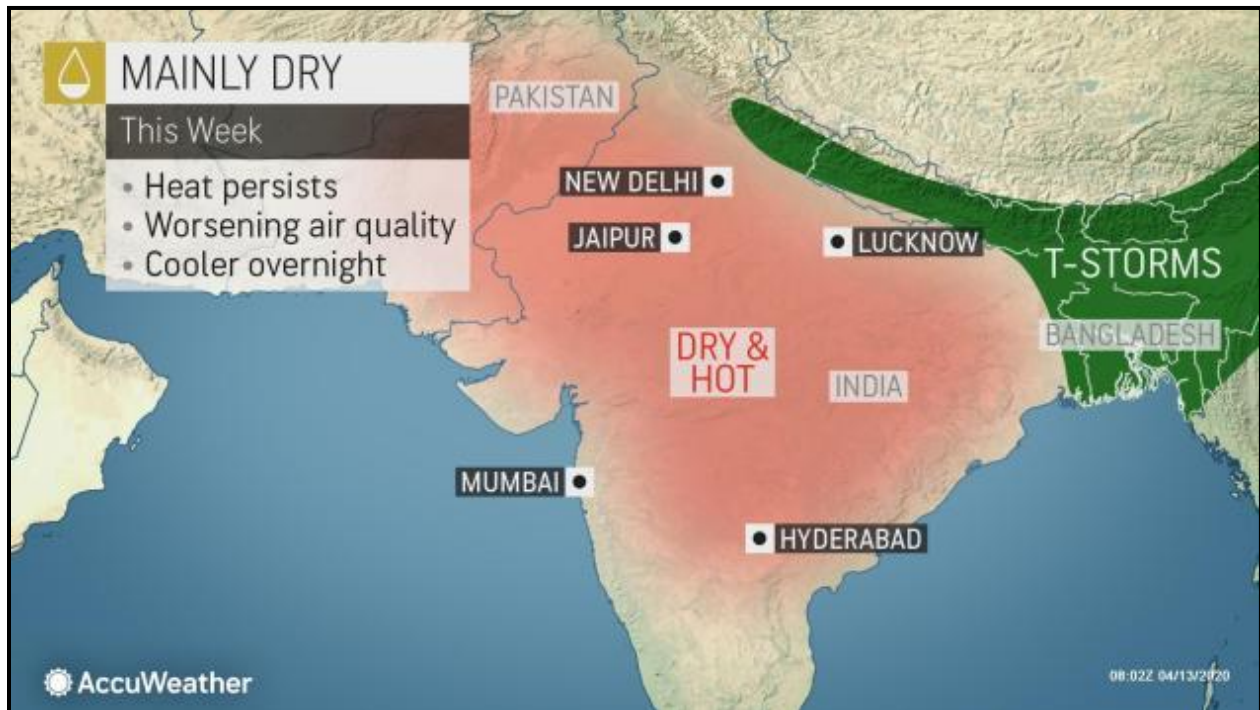
The average high temperature in New Delhi is around 35 C (95 F) during the middle of April, but by the end of the month, temperatures typically average near 38 C (100 F).

Afternoon temperatures climbed well above 38 C (100 F) in parts of the country on Sunday. Hoshangabad, New Kandla and Surendranagar reported high temperatures of 44 C (111 F).

Forecasters say during the upcoming stretch of hot weather this week, high temperatures near 38 C (100 F) or above can be expected in much of the country. However, there will be some periods of relief.

Without many storms to clear the air, pollution levels will increase, worsening the air quality at times. However, the amount of pollution in India, and many other places around

the world, has been lessened as communities go on lockdown amid the COVID-19 pandemic.



"Because this stretch of heat is coming in mid-April, temperatures will still be able to fall to more comfortable levels at night and the humidity will remain relatively low," said Houk.

The comfortable weather overnight will result in temperatures settling into the middle 20s C (mid- to upper 70s F).

"Similarly to last year, the late-spring warmup is starting earlier than normal across parts of India, including New Delhi," added Houk.

In 2019, the month of April ended with highs soaring well into the 40s C (near 110 F) across northern and central India. New Delhi ended the month with the average temperature about 3 C (5 F) above normal.

Elsewhere across the country, isolated thunderstorms are expected to develop, mostly during the afternoon hours, across northeastern India and into Bangladesh.

This will help to bring some relief from the heat, though with increased moisture levels from the Bay of Bengal, it will feel more humid.

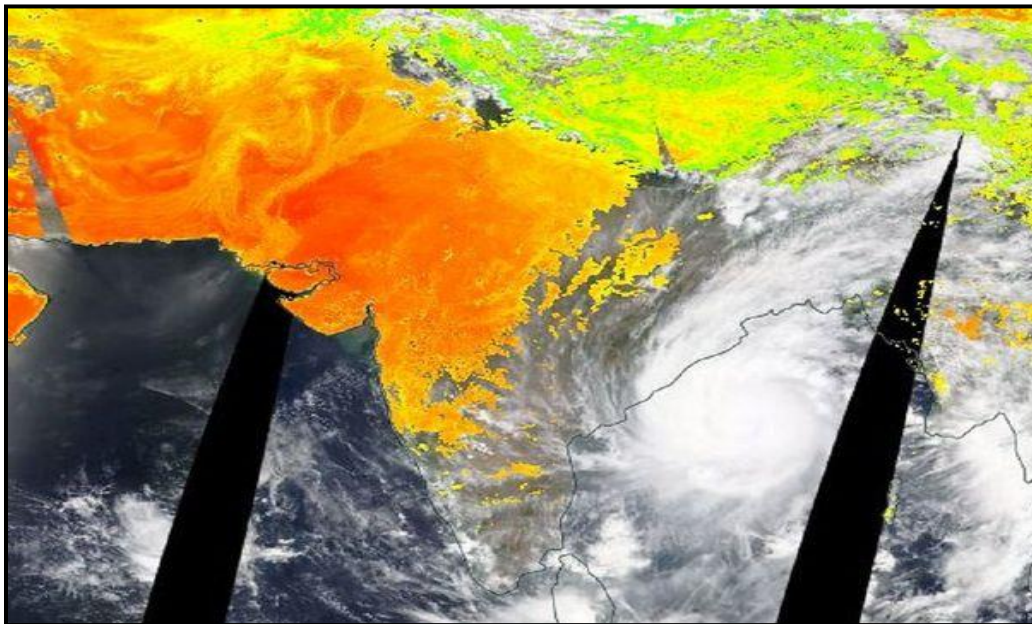
## **1.2 Heatwave in India: NASA's satellite images show horrid scenes of 2020 summer**

**Source:** timesnownews.com,28 May,2020

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The intense heatwave has left people gasping for breath and the horrid climate has made it worse for the lakhs of migrants walking back home from faraway lands due to the coronavirus lockdown.

India is currently experiencing one of the toughest phases in recent history. A pandemic that continues to rage through the country of 1.35 billion people, hungry migrants moving in lakhs across the length and breadth of the nation, and to add to India's woes, an unbearable blanket of heatwave.

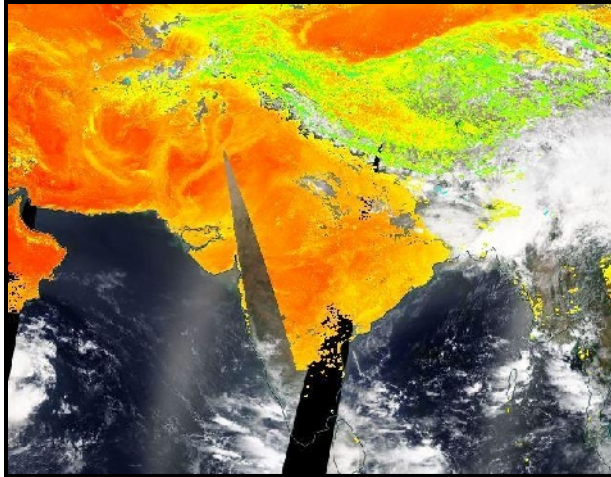


**The NASA satellite footage showing heatwave in India**

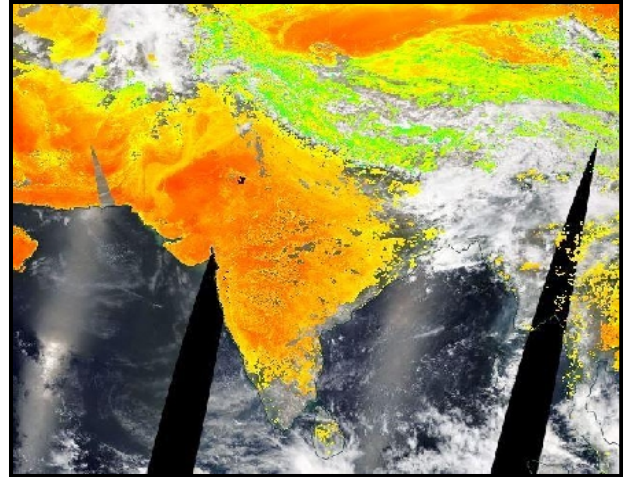
Temperatures have been soaring in an unrestrained manner over the past one month and a comparative study done by the National Aeronautics and Space Administration (NASA) in the past 30 days shows a yellowish blanket all over the country.

The intense heatwave has left people gasping for breath and the horrid climate has made it worse for the lakhs of migrants walking back home from faraway lands due to the coronavirus lockdown.





**27 May 2020**



**27 April 2020**

The satellite visuals from NASA show a clear picture of how bad the situation in India at this point.

The India Meteorological Department had predicted the heatwave to last at least for five-six days and in the current forecast, the weathermen have said that the existing condition is expected to get better from Thursday.

Churu in Rajasthan recorded 50 degrees Celsius on Tuesday, the district's second-highest maximum temperature for May in the past 10 years.

The Palam Observatory in Delhi on Wednesday recorded the highest maximum temperature at 47.2 degrees Celsius, slightly less than Tuesday's 47.6 degrees Celsius.

The heatwave has engulfed almost all of north and central India, as most places in the region recorded temperatures more than 47 degrees Celsius every day for the past five days.

Churu recorded 49.6 degrees on Thursday, followed by Ganganagar (48.9 degrees) and Bikaner in Rajasthan; Bathinda (Punjab) recorded 47.5 degrees Celsius.

"Under the influence of a western disturbance and an east-west trough and likely occurrence of rain/thunderstorm from May 28-30, maximum temperatures over plains of north India likely to recede from May 28 onwards with substantial reduction of heat wave conditions from May 29," the IMD said on Thursday.

### 1.3 India wilts as temperature hits 50 degrees Celsius

Source: phys.org, 27 May, 2020

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India is wilting under a heatwave, with temperatures in places reaching 50 degrees Celsius (122 degrees Fahrenheit) and the capital enduring its hottest May day in nearly two decades.



#### **The shade of a giant tree provided an escape from the heat for some Delhi residents**

Scorching weather is a growing menace in the world's second-most populous nation, and the United Nations warned this week that the coronavirus pandemic increased the associated health risks.

Indian meteorological officials said Churu in the northern state of Rajasthan was the hottest place on record on Tuesday, at 50 Celsius, while parts of Punjab, Haryana and Uttar Pradesh states sweltered in the high 40s.

Parts of the capital, New Delhi, recorded the hottest May day in 18 years with the mercury hitting 47.6 Celsius.

The hot spell is projected to scorch northern India for several more days, the Meteorological Department said late Tuesday, "with severe heat wave conditions in isolated pockets".

No deaths have been reported so far this year, but last year the government said the heat had killed 3,500 people since 2015. There have been fewer fatalities in recent years.

Last year, dozens of people died.

The country of 1.3 billion people also suffers from severe water shortages with tens of millions lacking running water—to say nothing of air conditioning.

Parts of Delhi and elsewhere regularly see scuffles when tankers arrive to deliver water. Last year, Chennai made international headlines when the southern city ran out of water entirely.

### **UN warning**

India now has the 10th highest number of coronavirus cases globally, climbing above 150,000 on Wednesday with almost 4,500 deaths. Cases are soaring in Delhi and Mumbai.

The UN's weather agency, the World Meteorological Organization, on Tuesday urged governments to make plans to keep people safe during heatwaves without spreading the virus.

"We're currently experiencing one of the hottest years on record," WMO spokeswoman Clare Nullis Kapp told a virtual briefing in Geneva.

"COVID-19 amplifies the health risks of hot weather for many people, and it complicates the task of managing it."

The United Nations agency teamed up Tuesday with non-governmental organisations to call for stronger preparations to keep people safe in hot weather while keeping a lid on the pandemic.

The information series, which covers topics such as ventilation, vulnerable populations and personal protection equipment, is being issued "to alert decision-makers to try to help them manage the dual challenge of heat and COVID", said Nullis Kapp.

In some places, what would typically be good advice during a heatwave—such as heading for air-conditioned indoor public spaces—runs counter to public health guidance for the coronavirus crisis.



## 1.4 India Underreports Heatwave Deaths. Here's Why This Must Change

Source: [indiaspend.com](https://indiaspend.com), 16 June, 2020



New Delhi: India counts among heat stroke deaths only those deaths medically certified as having been caused by direct exposure to the sun, thereby capturing only 10% of the real figure, leaving out deaths due to high ambient temperature. Accurate reporting is essential to create informed policies to build resilience, at a time when India is grappling with increasingly intense and frequent heat waves and is vulnerable to rising temperatures due to climate change, experts say.

Heat waves killed about 6,167 people in India over eight years to 2018. Of that, government records show, 34% (2,081 deaths) were in 2015, the year that saw one of the world's five deadliest heat waves on record, IndiaSpend reported on April 3, 2020.

India also does not recognise heat waves as a disaster under its disaster management law, thereby cutting it off from the government's disaster response fund, experts said adding



that this needs to change--the money is essential not only for relief but for building resilience, part of which involves creating early warning infrastructure.

### **Preparing for heat waves**

A heat wave is defined differently for varying topographies. In the plains, the maximum temperature has to be 40°C or above; in coastal areas 37°C or more; and in hill regions 30°C or higher, according to the India Meteorological Department, which provides heat-wave forecasts for more than 300 cities. In India, heat wave conditions are usually experienced between March and July, with acute heat waves occurring mostly between April and June.

Currently, parts of Rajasthan are under heat wave alert, though this year the temperatures have been relatively lower than in preceding years.

About 100 cities and 23 state governments have partnered with the National Disaster Management Authority (NDMA) to develop Heat Action Plans (HAP) as adaptation measures for extreme heat events. The first Heat Action Plan was launched in 2013 by the Ahmedabad Municipal Corporation, which went on to become a template for other regions.

However, for these action plans and warning systems to be effective, India needs to invest far more than what has been done till date. "There are not enough resources available to build resilience against heat waves because they are not recognised under the National Disaster Management Act, 2005, making them ineligible for money from national or state disaster response funds," said Chandra Bhushan, president and chief executive officer of the International Forum for Environment, Sustainability and Technology (iFOREST), a Delhi-based think-tank.

Unlike other extreme weather events, heat waves last much longer and have a protracted impact. A cyclone usually impacts a region for a day but heat waves could last for up to 15. "That is why money is needed to provide relief to the affected people and for additional investment in adaptation measures," Bhushan told IndiaSpend. "This investment needs to come from the home ministry's National Disaster Response Fund as it is the only fund in the country dedicated to deal with climate change fallout."

### **Underreported deaths**

Heat-related deaths are a crucial factor in determining adaptation policy but they are grossly under-reported in India.

Heat stroke deaths can be classified as direct deaths (due to exertion under direct sunlight) and indirect or non-exertional deaths (people who suffer a heat stroke due to high ambient temperature--such as those trapped inside homes with high room temperatures). Indirect

deaths are noticed mostly among old people with comorbidities, said Dileep Mavalankar, director of the Indian Institute of Public Health (IIPH), the country's first public health university in Gandhinagar. Mavalankar is closely associated with Ahmedabad's heat action plan.

"If you just look for medically certified heat stroke deaths, they account for only 10% of total deaths due to heat waves. That's because they only record easily recognisable direct deaths. Heat wave deaths are like an iceberg... 90% [which are indirect deaths] is not visible," Mavalankar told IndiaSpend.

Compensation is an important reason for underreporting of heat stroke deaths. In states where families of heat stroke victims are compensated, authorities use a narrow definition and description of the circumstances of death, thereby recording only direct deaths, Mavalankar had explained to IndiaSpend in June 2017.

Availability for municipal ward and city-level morbidity and mortality statistics is still one of India's biggest challenges. "In many cases, these [statistics] might be partially collected but they are not collated, rendering them unusable for better modelling and planning in terms of HAPs," said Polash Mukerjee, programme lead for air quality and climate resilience at Natural Resources Defense Council (NRDC) India, an international environmental advocacy group.

India also needs capacity building in frontline medical and emergency health services. For example, the Ahmedabad HAP contains a component for training municipal health workers and other medical personnel in identifying symptoms of heat stress as well as other symptoms of heat-related illnesses, Mukerjee added.

### **The heat is on**

Although favourable weather conditions have kept the country cooler this year, on average for six years to 2019, India has had 114 days of heat wave conditions every year.

There was only one major heat wave event over central and northwestern parts of India, which is prone to heat waves, said Madhavan Rajeevan, an atmospheric scientist and secretary at the Ministry of Earth Sciences. "This year heat waves have been a little subdued but we can expect heat waves over northwest India in June," Rajeevan told IndiaSpend.

Extreme temperatures and heat waves are set to increase due to the changing climate. As global CO<sub>2</sub> (carbon dioxide) emissions continue to rise, heat waves are likely to become more frequent and more intense, according to an October 2018 report by the Intergovernmental Panel on Climate Change, the United Nations body set up to assess climate science, IndiaSpend reported in August 2019.

The annual average temperature in India has risen by 2°C over 200 years till 2006. It is predicted to rise further by 1.5°-2°C by 2030. Within 50 years, 1.2 billion people in India would live in areas as hot as the Sahara, if greenhouse gas emissions keep rising.

A growing percentage of India's population is getting exposed to heat waves as the average duration of a heat wave has increased by 150%, from two days in 2012 to almost five days in 2016. In 2012, just under 20 million people were exposed to heat waves compared to 60 million in 2016, a 200% increase, IndiaSpend reported in November 2018.

Scientists, who studied India's 2015 heat wave, concluded that vulnerable regions including Andhra Pradesh and Telangana were likely to see intense heat waves once every decade instead of once every century.

While India's policies target cities, India's poorest areas are most vulnerable to heat waves. People living in underdeveloped parts of central India are most vulnerable to the health impacts of heat waves, according to the Heat Vulnerability Index for India, IndiaSpend reported in May 2017.

### **Action plans**

In 2016, after the success of Ahmedabad Municipal Corporation's heat action plan, the NDMA prepared guidelines for state governments to formulate action plans for prevention and management of heat waves. The are based on four key strategies: forecasting heat waves and enabling an early warning system, building capacity of healthcare professionals to deal with heat wave-related emergencies, community outreach through various media, and inter-agency cooperation as well as engagement with other civil society organisations in the region.

However, limited resources are hindering the adoption and roll-outs of these plans in several cities. "While some cities have emerged as a model for others, a much wider implementation of these HAPs is needed along with a robust institutional mechanism for building long-term community-level resilience," said Mukerjee of NRDC. NRDC has been involved in the conceptualisation of India's HAP strategy. "These HAPs require large additional allocation of resources... financial as well as additional regulatory and institutional capacities."

### **Heat resilience is beneficial**

Making HAPs more robust also makes economic sense, studies show. India is projected to lose 5.8% of working hours in 2030, a productivity loss equivalent to 34 million full-time jobs, either because it would be too hot to work or because workers would have to work at a slower pace, impacting the agriculture and construction sectors in particular, predicted a 2019 International Labour Organization report.

"Although most of the impact in India will be felt in the agricultural sector, more and more working hours are expected to be lost in the construction sector, where heat stress affects both male and female workers," said the report.

The impact of heat stress is not limited to sectors where employees are directly exposed to sunlight. Small industries, such as cloth-weaving units, which cannot afford air-conditioning, are also vulnerable to production losses due to a rise in temperatures, found a 2018 study prepared by the Energy Policy Institute at the University of Chicago (EPIC), a think-tank.

For every 1°C rise in temperature beyond 27°C on a hot day in India, productivity of workers drops by as much as 4%, said the study.

## **2. Heavy Precipitation Causing Floods and Landslides**

Extreme precipitation is related to climate change in that, all else being equal, a warmer atmosphere can “hold” more water vapor, and therefore deliver more rainfall when conditions for heavy precipitation events occur.

**Heavy rainfall can lead to numerous hazards, for example:**

- Flooding, including risk to human life, damage to buildings and infrastructure, and loss of crops and livestock.
- Landslides, which can threaten human life, disrupt transport and communications, and cause damage to buildings and infrastructure.



**Flood**



**Landslide**



## **2.1 Monsoon rains trigger tea plantation landslide in India's Kerala state, killing at least 43 people**

**Source:** edition.cnn.com,10 August,2020



**Rescue workers search for missing people at a landslide site caused by heavy rains in Pettimudy, in Kerala state, on August 8, 2020.**

(CNN)At least 43 people, including three children, have died with dozens more feared buried after torrential rains triggered a landslide in the southwestern Indian state of Kerala.

The landslide swept into a settlement housing workers on a tea plantation in Idukki district late Thursday, when most residents were sleeping. Dozens of houses were destroyed and 11 injured people were taken to local hospitals.

The death toll steadily rose as search and rescue workers spent the weekend digging through thick mud and debris, with efforts hampered further by heavy rain.

At least 25 people remain missing, according to district lawmaker Dean Kuriakose. More than 500 personnel from local forces and the National Disaster Response Force have been deployed to sift through the debris, he added.

"Despite inclement weather and harsh conditions, the search for those who went missing is progressing," Kerala's Chief Minister Pinarayi Vijayan tweeted Sunday.

On Monday, the Indian Meteorological Department issued a warning of "heavy to very heavy rainfall" in certain parts of the state for the next 24 hours. On Sunday, a red alert was in place for seven of the state's 14 districts.

Kerala has been battered by rain and flooding for weeks. On Friday, tragedy struck again when an Air India Express plane skidded off the runway and broke into two while landing at Kozhikode Calicut International Airport amid heavy rain.

The flight from Dubai had 190 people on board when it crashed, according to Air India Express. A total of 18 people died, including both pilots and four children.

For centuries, agriculture in South Asia has depended on the annual monsoon, which stretches from about June until September. But intense rains and floods also cause devastation and billions of dollars in damage and economic loss across much of the region every year.

In 2018, Kerala was hit with its worst flooding in almost a century following unusually high rainfall. Flash floods swept through the state, rivers overflowed and sewage lines were blocked, with more than 300 people killed and hundreds of thousands displaced.

Last year, Kerala and neighboring states were inundated again, with at least 150 killed, hundreds of homes destroyed and hundreds of thousands of people forced to take refuge in relief camps.

Since May this year, monsoon rains have triggered deadly flooding in the eastern Indian states of Assam and Bihar, affecting more than 2.4 million people, swamping large parts of a national park, and killing more than 100 wild animals, including a dozen rhinos.

Elsewhere in the region, Nepal has endured massive landslides and severe flooding, while nearly one third of Bangladesh -- and a fifth of its population of 161 million people -- have been affected by floods.

Floods have also engulfed huge swaths of southern China this year, with the Yangtze basin having its heaviest average rainfall in almost 60 years since June.

China's Ministry of Emergency Management put the direct economic cost of the disaster at \$21 billion in destroyed farmland, roads and other property. Some 55 million people have been affected.

## **2.2 Heavy rains trigger landslides, damage roads in Uttarakhand; IMD sounds alert for flash floods**

**Source:** indiatvnews.com,13 August,2020



**Dehradun: View of a road connecting Dehradun and Mussoorie that caved-in following heavy rainfall, in Dehradun, Tuesday, Aug. 11, 2020.**

Heavy rain lashed parts of Uttarakhand on Wednesday and Thursday, which resulted in water logging and landslides at several places. According to the India Meteorological Department, the state is very likely to receive heavy to very heavy rain at isolated places in the coming two to three days.

Heavy rain lashed parts of Uttarakhand on Wednesday and Thursday, which resulted in water logging and landslides at several places. According to the India Meteorological Department, the state is very likely to receive heavy to very heavy rain at isolated places in the coming two to three days. Besides the IMD, various other agencies have also sounded an alert for flash floods, torrential rainfall in the state for Thursday and the coming days.

Earlier on Wednesday, the State Disaster Management Center had warned about the possibility of heavy and very heavy rains in the state on Thursday. All District Magistrates

were also directed to take precautionary measures in order to avoid any untoward incidents.

Central Water Commission Official Flood Forecast in a tweet said, “Flash flood guidance for next 24 hours in parts of Himachal Pradesh, Uttarakhand, Eastern region of Rajasthan, Western region of Madhya Pradesh as given by the India Meteorological Department (IMD).”

Meanwhile, heavy and incessant rainfall in the state, coupled with landslides, led to the temporary closure of the Gangotri National Highway. The key highway was later closed for nearly 30 hours. Areas near the China border were also disconnected following heavy rains.

The national highway leading to Badrinath and Kedarnath shrines was blocked at several points due to falling of boulders after rain lashed Rishikesh in Uttarakhand's Dehradun district early on Wednesday.

The traffic was temporarily stopped to clear the highway, said SHO, Muni ki Reti police station, Kishor Saklani.

Boulders fell on the road at several points between Neer Gaddu and Shivpuri, the station house officer said, adding that an earth-mover machine got stuck while clearing the road for traffic.

The Ganga was flowing 10-cm above the warning level, and its water level continues to rise, Saklani said.

The water level of Henwal river, a tributary of the Ganga, has also risen and families living close to it have been shifted to safer places, the officer said.

## **2.3 Explained: Why Parts of India Are Seeing Extreme Rainfall & Floods**

**Source:** thequint.com,14 August,2020

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There have been 285 reported flooding events in India over 1950-2017 affecting about 850 million people.

Heavy rainfall has been lashing Jaipur since 13 August, continuing on Friday, 14 August, leading to severe waterlogging in several parts of the city. The IMD has also predicted fairly widespread rainfall with heavy to very heavy rainfall at isolated places in Rajasthan over the next two days.





Less than two months ago, the western coast of India was bracing itself for cyclone **Nisarga**, and it is now dealing with a torrential downpour. The Indian Meteorological Department (IMD) predicts active monsoon conditions over the west coast including Mumbai and east coast of India and likely intense rainfall over Gujarat, Madhya Pradesh, Chhattisgarh and Odisha. Southwest Monsoon currently is in Active to Vigorous phase over the Konkan coast and adjoining area of west coasts including Mumbai and east coast of India covering Odisha and Gangetic West Bengal.

## **2.4 Heavy Rain Hits Normal Life In Jammu And Kashmir**

**Source:** [ndtv.com](http://ndtv.com), 27 August, 2020

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Jammu and Kashmir weather: Heavy rain caused landslides and flash floods in Jammu and Kashmir. Flood waters entered houses of people in several areas in Jammu.

Jammu and Kashmir weather news: Incessant rain pounded Jammu and Kashmir since Monday causing landslides and flash floods. According to the India Meteorological Department's (IMD) weather forecast, there will be no immediate relief. The IMD on Wednesday said "intense rainfall activity" is expected over several parts of north India for the next four days. Jammu and Kashmir, Uttarakhand, Himachal Pradesh, eastern Uttar Pradesh, eastern Rajasthan, Punjab, Haryana and Delhi are expected to get more rain till the weekend.





**Jammu weather image: IAF chopper rescued a person stranded in flash floods on Wednesday**

People residing along the river and in the higher reaches of Rajouri district have been advised to stay alert following heavy rain.

"We have alerted people living especially in areas near Tawi river like Thana Mandi, Rajouri district, Nowshera and Manja Kot. If there is heavy rain in a specific area, we will inform them as the flow of the river may increase," senior police officer, Liaqat Choudhary told news agency ANI..

Fifteen people were rescued on Wednesday after they were caught in flash floods in Ujh river in Kathua district of Jammu and Kashmir, the police said.

Timely action saved lives of many, including women and children, who were trapped in temporary shelters near the river in Rajbagh area, news agency Press Trust of India quoted a police official as saying. The district administration in Rajouri has asked people living in the low-lying areas and along the rivers, to be alert.

Most parts of Jammu region have been battered by heavy rain since Tuesday leading to inundation of low-lying areas. Flood water entered homes of many people.



### **Jammu: People throw out flood waters from their house after heavy rain on Wednesday**

The Indian Air Force, in a swift action, rescued a civilian who was stranded on a marooned island in Rajouri yesterday, a defence spokesman said. "A message was received in the evening about an individual stranded on a marooned island south of Naushera. An IAF helicopter, captained by Squadron Leader Ganesh Prasad Honakuppe, was immediately pressed into service to rescue him," the spokesman said.

## **3. Cyclones**



A cyclone is a general term for a weather system in which winds rotate inwardly to an area of low atmospheric pressure. For large weather systems, the circulation pattern is in a counterclockwise direction in the Northern Hemisphere and a clockwise direction in the Southern Hemisphere. There are two types of cyclones: middle

latitude (mid-latitude) cyclones and tropical cyclones. Mid-latitude cyclones are the main cause of winter storms in the middle latitudes. Tropical cyclones are also known as hurricanes. Tropical cyclones are like giant engines that use warm, moist air as fuel. That is why they form only over warm ocean waters near the equator. The warm, moist air over the ocean rises upward from near the surface. As the warmed, moist air rises and cools off, the water in the air forms clouds.

### **Effects of Cyclones :**

- Once a cyclone has hit it can cause mass damage to the human environment. The cyclone's strong winds can rip the roof of a house or destroy it entirely. It can send flying debris into houses. Any objects that have not been tied down will get sent flying most likely never to be found again.
- The impact from cyclones extends over a wide area, with strong winds and heavy rains. However, the greatest damage to life and property is not from the wind, but from secondary events such as storm surges, flooding, landslides and tornadoes.

### **3.1 Cyclone Nisarga: Rare storm in decades pounds India's west coast**

**Source:** aljazeera.com, 3 June, 2020



**Mumbai has not been hit by a cyclone in more than 70 years, raising concerns about its readiness**

Over 100,000 people, including coronavirus patients, moved to safety as rare cyclonic storm lashes Mumbai and suburbs.

Cyclone Nisarga, which intensified into a severe cyclonic storm in the Arabian Sea, is making landfall along India's western coast, forcing a high



alert in the financial hub of Mumbai and evacuation of tens of thousands of people.

“landfall process started and it will be completed during the next three hours. The northeast sector of the eye of the severe cyclonic storm Nisarga is entering into the land,” India’s meteorological department said on Wednesday.

Nisarga dropped heavy rains and winds gusting up to 120km (75 miles) per hour as a category 4 cyclone near the coastal city of Alibagh, about 98km (60 miles) south of Mumbai, the capital of Maharashtra state and home to more than 18 million people.

At least 100,000 people, including coronavirus patients, were moved to safer locations, according to officials. The storm surge threatened to flood beaches and low-lying slums as city authorities struggle to contain the pandemic.



### **Media reports said Nisarga is the worst cyclone to hit the region in more than 70 years**

Live TV coverage showed inky black clouds framing the sea on India’s western coastline. Trees swayed wildly, as the rain pounded the coastal towns and villages of Maharashtra.

In Mumbai, the home of Bollywood and India’s largest stock exchange, high winds whipped skyscrapers and ripped apart shanty houses near the beach.

Reporting from New Delhi, Al Jazeera’s Elizabeth Puranam said there are many dwellings along the coastal areas which are not structurally sound to withstand the storm.

“We have seen many trees uprooted in parts of Maharashtra as India’s west coast, including the states of Goa and Gujrat, are hit by really strong winds and heavy rain and high tides even before Cyclone Nisarga made landfall,” she said.

Media reports said Nisarga is the worst cyclone to hit the region in more than 70 years, raising concerns about readiness in Mumbai and neighbouring areas.

The cyclone threatens to worsen prospects for an economic turnaround as a nine-week-long government-imposed coronavirus lockdown began to ease this week.

India’s largest container port, Jawaharlal Nehru Port Trust, on the outskirts of Mumbai, was ordered to shut for 24 hours, the port said in a statement.



**People scramble to enter a truck during an evacuation of a slum in Mumbai as Cyclone Nisarga makes its landfall**

### **Area grappling with pandemic**

The storm came as the Indian region grapples with the ongoing coronavirus pandemic.

Maharashtra and Gujarat states have reported about 44 percent of India’s more than 200,000 COVID-19 cases nationwide, and 61 percent of all virus deaths.

The metropolis of Mumbai is already struggling with the highest number of coronavirus cases with more than 41,000 infections.



Local news reports have shown an overwhelmed hospital system in Mumbai, with patients resting on hospital floors until beds become available and bodies left in wards.

Maharashtra Chief Minister, Uddhav Balasheb Thackeray, said some 150 coronavirus patients had been moved out of a hospital near the city's beachfront.

Some 100,000 people were evacuated from low-lying areas in Maharashtra and neighboring Gujarat, according to the Press Trust of India news agency.

Both states, already among the hardest hit by the coronavirus pandemic, activated disaster response teams, fearing extensive flooding could further impair overwhelmed health systems.

"If hospitals and clinics are damaged by the cyclone, the city won't be able to cope with the large number of COVID-19 cases, and social distancing measures will become virtually impossible to follow," Bidisha Pillai, chief executive of Save the Children in India, said in a statement.

### **Rare cyclone**

Cyclones often skirt densely populated Mumbai, though every year during torrential rains of the June-September monsoon season roads are submerged, and the suburban railway service that serves millions of people comes to a halt.

But the city has rarely faced the brunt of cyclones – the last severe storm to hit the city struck in 1948, killing 12 people and injuring more than 100.

The NDRF has mobilised 32 teams, and a total of 1,500 men are ready in the two states to help with evacuations and relief.

Nisarga is the second cyclone to strike India in a little less than two weeks. On May 21, Cyclone Amphan battered the country's eastern coast including Kolkata, and neighbouring Bangladesh, killing more than 100 people and leaving a trail of destruction.

Although post-monsoon flooding is common in Mumbai in the fall, some experts fear the city is not prepared for the strong winds and storm surges that come with the cyclone.

"There's been no test of how the city does in a cyclone," said Adam Sobel, a climate scientist at Columbia University who has studied the risk to Mumbai. "It just makes me nervous."

### **3.2 Cyclone Amphan To Turn Extremely Severe In 24 Hours: Weather Agency**

**Source:** ndtv.com,4 June,2020



#### **Cyclone AMPHAN is likely to make landfall off West Bengal coast on May 20**

New Delhi: Cyclone Amphan, a "very severe storm", will turn "extremely severe" in the next 24 hours, weather agency India Meteorological Department said on Sunday.

The weather phenomenon will cause heavy rainfall and high-velocity wind in several coastal districts of Odisha, West Bengals, and Andaman and Nicobar.

"The Severe Cyclonic Storm 'Amphan' (pronounced as UM-PUN) over central parts of South Bay of Bengal and neighbourhood moved slowly northwards with a speed of 05 kmph during past 06 hours. It further intensified into a Very Severe Cyclonic Storm," an IMD statement said.

"It is very likely to intensify further into an Extremely Severe Cyclonic Storm during next 24 hours.



**Residents walk along a street heading to a shelter ahead of Amphan's landfall in Bangladesh's Khulna district**

It is very likely to move nearly northwards slowly during next 12 hours and then re-curve north-northeastwards and move fast across northwest Bay of Bengal and cross West Bengal - Bangladesh coasts between Digha (West Bengal) and Hatiya Islands (Bangladesh) during the afternoon / evening of 20th May 2020 as a Very Severe Cyclonic Storm," it added.

The weather agency said there can be light to moderate rainfall in Andaman and Nicobar in the next 24 hours.

"Rainfall (over Odisha & Gangetic West Bengal) Coastal Odisha is likely to experience light to moderate rainfall at many places with heavy falls at isolated places from 18 May evening. Rainfall at most places with heavy to very heavy rainfall at a few places on 19 May, and isolated heavy rainfall over north coastal Odisha on 20 May 2020," it said.

Coastal districts of West Bengal are also likely to experience light to moderate rainfall at many places with heavy rainfall at isolated places on May 19.

"Squally wind speed reaching 45 to 55 kilometre per hour (kmph) gusting to 65 kmph is likely to commence along and off south Odisha coast from May 18 evening, extending to along and off north Odisha coast from May 19 morning. The wind speed will gradually

increase becoming gale wind speed reaching 75 to 85 kmph gusting to 95 kmph from 20. morning along and off north Odisha and West Bengal coasts," it said.

"It will gradually increase thereafter becoming 110 to 120 kmph gusting to 135 kmph along and on North Odisha coast and 120 to 140 kmph gusting to 155 kmph along and off West Bengal coast from the afternoon of 20 May 2020. Gale wind speed reaching 120-130 gusting to 145 kmph is prevailing over southeast and adjoining southwest Bay of Bengal. It is likely to increase becoming 140-150 gusting to 165 kmph over southern parts of central Bay of Bengal," it added. Cyclone AMPHAN is likely to make landfall off West Bengal coast on May 20. The National Disaster Response Force (NDRF) has sent its 10 teams to Odisha and 7 teams to West Bengal to tackle the cyclone.

### **3.3 Depression in Bay of Bengal intensifies into deep depression, to cross Andhra Pradesh coast on October 13: IMD**

**Source:** timesofindia.indiatimes.com,12 October,2020



**Depression in Bay of Bengal intensifies into deep depression, to cross Andhra Pradesh coast on October 12:IMD**

NEW DELHI: The depression over the Bay of Bengal intensified into a deep depression on Monday and it is likely to cross the north Andhra Pradesh coast between Narsapur and Vishakhapatnam early Tuesday, the India Meteorological Department said.

Under its influence, very heavy rainfall is expected over Telangana, heavy to very heavy falls at isolated places are likely over Karnataka, Rayalaseema, Chawada on Tuesday, the Cyclone

Heavy rainfall at isolated places is also likely over north coastal Andhra Pradesh, south Odisha, and Vidarbha, it said.

"Yesterday's depression over west-central Bay of Bengal moved west-northwestwards, intensified into a deep depression. It is very likely to move west-northwestwards and cross



north Andhra Pradesh coast between Narsapur and Vishakhapatnam, close to Kakinada during the early morning of October 13 as a deep depression with maximum sustained wind speed of 55-65 kmph gusting to 75 kmph," it added.

Deep depression is a stage below any cyclonic circulation intensifies into a cyclone.

October usually witnesses formation of cyclones over the Bay of Bengal that batter the eastern coasts, especially Odisha and Andhra Pradesh.

Squally wind speed would increase to 55-65 kmph gusting to 75 kmph over west central Bay of Bengal and along off the Andhra Pradesh coast and 50-60 kmph gusting to 70 kmph over adjoining northwest Bay of Bengal, southwest Bay of Bengal and along and off the coasts of Odisha, Tamil Nadu and Puducherry from Monday evening, the IMD said.

Sea condition will be "rough to very rough" along and off the Odisha, Andhra Pradesh, Tamil Nadu and Puducherry coasts till October 13 evening and over Gulf of Mannar during October 12-13.

Fishermen are advised not to venture into west-central, northwest and southwest Bay of Bengal, along and off the Andhra Pradesh, Odisha, Tamil Nadu and Puducherry coasts till evening of October 13 evening and over Gulf of Mannar during October 12-13.

Its maximum sustained winds of 195 mph are the strongest in the western Pacific since Super Typhoon Meranti in 2016, which also had peak winds this strong. As it slams into Catanduanes Island early Sunday, east of the Philippines most populous island of Luzon, it may match the intensity of Super Typhoon Haiyan, the catastrophic storm that devastated Tacloban City in the Philippines in 2013.

#### **4. Smog & Urban Air Pollution**



Smog is a kind of air pollution, originally named for the mixture of smoke and fog in the air. Classic smog results from large amounts of coal burning in an area and is caused by a mixture of smoke and sulfur dioxide.

In the 1950s a new type of smog, known as Photochemical Smog, was first described.



## **Types of Smog :**

At least two distinct types of smog are recognized: **sulfurous smog** and **photochemical smog**.

- Sulfurous smog, which is also called “London smog,” results from a high concentration of sulfur oxides in the air and is caused by the use of sulfur-bearing fossil fuels, particularly coal.
- Photochemical smog is a mixture of pollutants that are formed when nitrogen oxides and volatile organic compounds (VOCs) react to sunlight, creating a brown haze above cities. It tends to occur more often in summer, because that is when we have the most sunlight.

## **Health Effects of Smog :**

Smog is a problem in a number of cities and continues to harm human health.

- Ground-level ozone, sulfur dioxide, nitrogen dioxide carbon monoxide are especially harmful for senior citizens, children, and people with heart and lung conditions such as emphysema, bronchitis, and asthma.
- It can inflame breathing passages, decreasing the lungs' working capacity, and causing shortness of breath, pain when inhaling deeply, wheezing, and coughing.
- It can cause eye and nose irritation and it dries out the protective membranes of the nose and throat and interferes with the body's ability to fight infection, increasing susceptibility to illness.

## **4.1 Smog returns to India capital as wind drops, farmers burn stubble**

**Source:** aljazeera.com,16 October,2020

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With industrial activities resuming and cars back on roads – along with less wind – air quality in the city again falls to unhealthy levels.

The Indian capital's air quality levels have plunged to “very poor” and a smoggy haze has settled over the city, days after the state government initiated stricter measures to fight air pollution. The Air Quality Index (AQI) in New Delhi rose past 270 on Friday, according to SAFAR, India's main environment monitoring agency, after agricultural fires in neighbouring states sent smoke billowing across the city.

On Thursday, the AQI level had crossed 300, indicating “very poor” conditions that pose a risk of respiratory problems.

The World Health Organization deems anything above 25 as unsafe.

Since October 1, New Delhi’s average AQI was more than 36 percent higher than the figures for the same period a year ago, according to the data compiled by the Reuters news agency.



### **Rickshaw pullers in New Delhi as a thick layer of smog covers the city**

The Indian capital, one of the world’s most polluted cities, enjoyed a respite from air pollution up until September in part due to a coronavirus lockdown.

But with industrial activities resuming and cars back on the roads – along with the onset of cooler weather and less wind – air quality in the city has once again fallen to unhealthy levels.

Lower wind speeds let deadly pollutants like PM2.5 particles hang in the air.

PM2.5, particles that are less than 2.5 microns in diameter, can be carried deep into the lungs, causing deadly diseases, including cancer and cardiac problems.

October is also the time of year when farmers in neighbouring regions, including the states of Haryana and Punjab, set fire to their fields after having harvested them to clear them, despite there being a ban on it.

That smoke travels to New Delhi, leading to a surge in pollution levels in the city of more than 20 million people and exacerbating what is already a public health crisis.



### **New Delhi's iconic India Gate in the background covered by thick smog**

Health experts say high air pollution levels over a prolonged period have compromised the disease resistance of people living in New Delhi, making them more susceptible to the coronavirus.

Over the years, the pollution crisis in New Delhi has piled public pressure on the government to tackle the root causes.

Authorities have often introduced a system that restricts many private vehicles from taking to the roads for two weeks. It has also ordered firefighters to sprinkle water from high-rise buildings to settle the dust, tried to snuff out rubbish fires and ordered builders to cover construction sites to stop dust from enveloping the area. But the problem continues to persist.

During the peak pollution periods last year, air pollution levels in New Delhi sometimes soared even off the measurable scale. A dark yellow haze blanketed the city for several days, forcing schools to close and flights to be diverted.

The Indian Agricultural Research Institute says it has developed a microbial liquid solution that softens crop stubble and turns it into compost, thus ruling out the need to burn the agricultural crop.

The watery solution is made of four capsules that cost a little less than half a dollar and can be used for the rapid decomposition of crop residue.

K Annapurna, a senior scientist at the public institute, said the solution can help with pollution levels while at the same time retaining the essential nutrients in the soil that are otherwise damaged when the residue is burned.

## **4.2 India's capital chokes on 'severe' smog as farm fires soar**

**Source:** [phys.org](https://phys.org), 23 October, 2020



**The worsening conditions came as Trump complained that action on climate change was unfair to the US**

New Delhi was blanketed in noxious haze Friday as air pollution levels in parts of the city soared to "severe" levels, hours after US President Donald Trump described the air in the vast nation as "filthy".

Smoke from agricultural burning, vehicle fumes and industrial emissions—combined with cooler temperatures and slow-moving winds that trap pollutants over the city—turns air in the Indian capital into a toxic soup every winter.

The air quality index at Delhi's 36 pollution monitoring sites—which monitors tiny PM2.5 and PM10 particles that get into the bloodstream and vital organs—was between 282 and 446, pushing levels into the "severe" category, the Central Pollution Control Board said.

The "good" category is between 0-50, the government's environmental watchdog added.

A "significant increase in stubble fire count" to 1,213 in Haryana and Punjab states was the highest of this season and made up 17 percent of Delhi's PM2.5 levels, the state-run System of Air Quality Weather Forecasting and Research added Friday.

"Further deterioration of (air quality) is expected for the two days," SAFAR said.

This season's burning started earlier because of advanced sowing and harvesting by farmers amid fears of labour shortages during the coronavirus pandemic, officials said.



### **Every winter the air in Delhi turns into a toxic soup**

The worsening conditions came as Trump complained that action on climate change was unfair to the US. "Look at China, how filthy it is. Look at Russia, look at India—it's filthy. The air is filthy," Trump said at his presidential debate with Democratic rival Joe Biden. Scientists warned this year's pollution season would make Delhi's 20 million residents more vulnerable to the coronavirus.



"Air pollution increases the risk of noncommunicable diseases—the same underlying conditions that make people more likely to experience severe illness or death from COVID-19," epidemiologist Sumi Mehta from global non-profit Vital Strategies told AFP. Healthcare systems, stretched by the pandemic, could be further stressed by more hospitalisations from pollution-related illnesses, researchers added.

"There are serious worries that during winter when higher air pollution levels in any case worsens respiratory illness and increases hospitalisation, the vulnerability to COVID-19 may be further enhanced," Anumita Roy Chowdhury of the Delhi-based Centre for Science and Environment told AFP. The chief medical officer of Gurugram city near New Delhi, Virender Yadav, told The Times of India Thursday some recovering COVID-19 patients were experiencing a reoccurrence of respiratory conditions triggered by the heightened air pollution.

#### **4.3 Air pollution as severe in villages as in urban India, reveals study**

**Source:** hindustantimes.com,4 November,2020



**An anti-smog gun sprays water to control air pollution, at ITO in New Delhi on November 3**

Outdoor pollution is not primarily an urban problem and ambient air is as toxic in rural parts of India as in the urban regions, found a new study part-funded by NASA that

combined satellite data with modelling to estimate levels of small particulate matter (PM<sub>2.5</sub> > 2.5 µm) that damage health and lead to early death.

In the rest of India, the average PM<sub>2.5</sub> levels are similar in rural and urban areas, found the study by researchers from the Colorado State University and Indian Institute of Technology Bombay.

It found that most people in India (84% of the population) are exposed to pollution well above the limit of India's standard (40 µg/m<sup>3</sup>), and almost the entire country is exposed to levels higher than the WHO standard (10 µg/m<sup>3</sup>), with "a long tail of very high concentrations (>160 µg/m<sup>3</sup>) in the urban regions in the Indo-Gangetic plains and parts of non-urban areas in eastern and western India".

Around 16% of India's population is not affected by this pollution (below 40 µg/m<sup>3</sup>), and that is mostly confined to the very north-western parts of India, the Western Ghats, and a few regions within India.

The fraction that is below the WHO standards is very small (<0.001%), said the study, which has implications for air quality monitoring, regulations, public health, and policy. It was published in the journal, Proceedings of the National Academy of Sciences (PNAS) on Tuesday.

"I was a little surprised (with the results), though our previous work was indicating this. We calculated these using satellite data, so no, there are no significant gaps," said lead author R. Ravishankara, University Distinguished Professor, Departments of Chemistry and Atmospheric Science at Colorado State University, US, in an email.

"Only the very north western part of India appears to be below the threshold for PM<sub>2.5</sub>. We have used premature mortality as the metric to measure the health impact. In addition to premature mortality, there are other negative impacts such as asthma, hospital visits, medical costs, etc," said Ravishankaran.

The findings are in line with the State of Global Air 2020 report released in October, which said that India had recorded the highest annual average PM<sub>2.5</sub> concentration exposure in the world in 2019, followed by Nepal, Niger, Qatar and Nigeria.

For the PNAS study, researchers calculated the annually averaged aerosol optical depth (AOD) from three satellite instruments (Methods) that were converted to surface PM<sub>2.5</sub> abundances using PM<sub>2.5</sub>:AOD ratios from the GEOS Chem chemical transport model.

They then compared the satellite-derived daily and annual PM<sub>2.5</sub> with the surface PM<sub>2.5</sub> measured by India's Central Pollution Control Board at 20 monitoring sites, most of which were in urban areas.

The annual premature deaths attributable to PM2.5 alone for urban and rural India is 1.05 million, found the study, which factored in six causes of death: ischemic heart disease, stroke, lower respiratory infections, chronic obstructive pulmonary disease, lung cancer, and type-2 diabetes.

Long-term exposure to outdoor and household air pollution contributed to over 1.67 million annual premature deaths from stroke, heart attack, diabetes, lung cancer, chronic lung diseases, and neonatal diseases, in India in 2019 according to State of Global Air Report 2020.

The analysis revealed that the risk of premature deaths attributable to PM2.5 is similar in rural and urban regions, but there were more deaths in rural areas as it is home to 69% of the country's population.

"We have used premature mortality as the metric to measure the health impact. These are quantified in the paper. In addition to premature mortality, there are other negative impacts such as asthma, hospital visits, medical costs, etc," said Ravisankaran.

The findings suggest that efforts to monitor and curtail air pollution should not be limited to India's urban areas.

Enhancing monitoring and regulation in rural areas, which are virtually non-existent, could help better assess the risks and inform policy for pan-India reduction of PM2.5 levels keeping in mind the rural populations lower ability to reduce risks because of economic reasons.

"The Global Burden of Disease 2019 shows us that possibly 100% of India is exposed to air that is not meeting the WHO guidelines, and anywhere between 69% to 85% of the population is exposed to air that doesn't meet the national standard.

Now there is a mix of satellite, chemical transport and ground monitor data to prove this.

There are studies now showing that 30% to 50% of outdoor air pollution is contributed by household sources of emissions.

The health impacts on both rural and urban populations could range from cardio-respiratory, cardiovascular conditions, diabetes, low birthweight, preterm birth and neonatal mortality," said Kalpana Balakrishnan, the director of the Indian Council of Medical Research Centre for Advanced Research on Air Quality, Climate and Health, Chennai.

#### **4.4 India's capital New Delhi suffers most toxic air in a year**

**Source:** aljazeera.com, 5 November, 2020



##### **Smog envelopes the skyline in New Delhi**

New Delhi, the capital city with the worst air quality worldwide, suffered its most toxic day in a year on Thursday, recording the concentration of poisonous PM2.5 particles at 14 times the World Health Organization's safe limit.

A raging coronavirus epidemic, with more than 400,000 confirmed cases in the city of 20 million, has heightened alarm over the health hazard posed by the choking smog, with doctors warning of a sharp increase in respiratory illnesses.

"At this time in Delhi, coronavirus and pollution are causing a major havoc," Arvind Kejriwal, New Delhi's chief minister said in a recorded video on Twitter.

"We are seeing all around the sky is covered with smoke, and because of this, the situation from coronavirus is worsening."

The deadly PM2.5 particles are less than 2.5 microns in diameter, can penetrate the lung barrier and enter the blood system, potentially causing cardiovascular and respiratory diseases including lung cancer, according to WHO.

"Woke up with a feeling that poisonous garbage is stuck in my windpipe," said Rahul Ojha, a resident who tagged government authorities in a tweet, blaming them for inaction.

New Delhi's air pollution typically worsens in October and November due to farmers burning off stubble in surrounding states, traffic fumes and windless days.

On Thursday, the federal air quality and weather monitoring agency recorded 4,135 incidents of farm fires – the highest of the season. Firecrackers ignited for a Hindu festival on Wednesday added to the problem, some people said.

The average PM2.5 level was 370 per cubic metre of air against the WHO's prescribed safe limit of 25 per cubic metre.

The overall air quality index (AQI), which includes other pollutants besides PM2.5 particles, crossed 460 on a scale of 500, the worst since November 14, 2019.

If the air quality stays in the severe zone for 48 hours, authorities could bar vehicles entering New Delhi, shut down construction, and stop half the cars owned by residents from being driven on roads through an odd-even scheme.

#### **4.5 Delhi's air quality remains in 'severe category'**

**Source:** [newindianexpress.com](http://newindianexpress.com), 8 November, 2020



**Vehicles seen moving through thick smog as the air quality deteriorates with the rise of pollutants in the atmosphere, in New Delhi.**



NEW DELHI: Air Quality Index (AQI) continues to worsen in the national capital, it has recorded in the 'severe category' on Sunday, as per Central Pollution Control Board (CPCB).

In Anand Vihar, the Air Quality Index (AQI) was recorded at 431, in Jahangirpuri 465, 426 in Punjabi Bagh, and 424 in Rohini, all were recorded in 'severe category', as per CPCB.

"Several plastic factories are running in Mayapuri, due to which the pollution is rising here. We are facing several problems because of it, we are not able to breathe properly," said a local, Rajesh, in West Delhi.

"Due to pollution, I am having throat problems, and in breathing too, however, to avoid all this, I try to be fit and have not stopped my morning walk," said another local.

"I ride cycle, but due to speed breathing, I am not able to put face mask every time, the situation is really harmful," said a young cyclist.

An AQI between 0-50 is marked good, 51-100 is satisfactory, 101-200 is moderate, 201-300 is poor, 301-400 is very poor and 401-500 is considered severe. According to experts, the severe category affects the health of people and seriously impacts those with existing diseases. According to experts, the severe category affects the health of people and seriously impacts those with existing diseases.

## 5. Wildfire



A wildfire is an unplanned fire that burns in a natural area such as a forest, grassland, or prairie. Wildfires are often caused by human activity or a natural phenomenon such as lightning, and they can happen at any time or anywhere. In 50% of wildfires recorded, it is not known how they started.

### **Effect of wildfire on Human and Animals & Environment :**

- Mortality is most likely when fires are large, intense, and produce a lot of ground smoke. In most cases, habitat modification poses a much greater threat to animals than the fire itself. In the period immediately following a fire, many animals are forced to move to other areas in order to find food and/or shelter.

- Wildfires release large amounts of carbon dioxide, black carbon, brown carbon, and ozone precursors into the atmosphere. These emissions affect radiation, clouds, and climate on regional and even global scales. Wildfires Affect Air Quality.
- It also includes erosion, landslides, debris flows, and altered water quality. The risk of floods and debris flows increases due to the exposure of bare ground and the loss of vegetation.

### **5.1 '2020 Is So Cruel': Heartbreaking Visuals of Uttarakhand Forest Fires Emerge on Twitter, Netizens Appeal For Help**

**Source:** india.com, 27 May, 2020



New Delhi: Seems 2020 is not ready to take a break as yet another disaster in the form of forest fires in Uttarakhand has emerged. As per reports, Uttarakhand is burning for the last 4 days with 46 forest fires reported in the state so far.

A maximum of 21 wildfires has been reported from Kumaon region while the Garhwal region and the reserve forest areas in the state have witnessed 16 and nine wildfires respectively.

As a result of the rising temperatures, forest fires have destroyed nearly over 71 hectares of forest covers and caused tremendous loss of flora and fauna.

As the fire rages, netizens are sharing horrifying visuals of the tragedy and appealing to the authorities to save their forests:

Someday, the whole Mother Nature will be no more. Amazon fire, Australian bushfire, and now Uttarakhand's forest fire. Loss of flora and fauna has been reported. It's time to adopt the pace of Nature now.

## **5.2 Devastating pictures from Uttarakhand forest fires over last four days— forests burn as North India becomes the world's warmest region**

**Source:** [businessinsider.in](https://www.businessinsider.in), 27 May, 2020

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- At least 2 people have reportedly lost their lives due to wildfires in Uttarakhand, whereas one person was injured.
  - The wildfires have affected 71 hectares of forest land, risking the lives of hundreds of species living there.
  - According to the government, this may not be the worst year for wildfires as intermittent rains and high moisture levels have helped in preventing such instances.



As many as 46 forest fires have been wreaking havoc in Uttarakhand for over four days — incurring a loss of ₹1.32 lakhs.

The rising temperature and hot spells have pumped super hot winds all over North India — making it the warmest region around the world on May 26 along with south-east Pakistan. A large number of species of animals living there struggled to survive. According to the forest department, a forest fire first broke out in Srinagar district on May 23 and it is difficult to control the fires due to winds.

The hilly state has 38,000 square kilometers of forest areas — which is home to 1145 plant species ranging from Brahma Kamal to the famous mythological Sanjivani Booti.

This comes at a time when there are 401 confirmed cases of coronavirus, of which 4 patients have died and 64 have recovered. At least 2 people have reportedly lost their lives due to wildfires in Uttarakhand, whereas one person was injured.

The wildfires have affected 71 hectares of forest land, risking the lives of hundreds of species living there. Kumaon region is the worst-hit area with 21 wildfires incidents. Whereas, the Garhwal region reported 16 wildfires and the forest reserve witnessed nine instances.

According to the government, this may not be the worst year for wildfires as intermittent rains and high moisture levels have helped in preventing such instances. "Forest fires have come down a lot this season. Partly due to less anthropogenic activity and partly due to rains," Press Information Bureau said in a tweet. Although devastating, these wildfires take place every year due to rising temperatures. The state recorded 1,590 wildfire cases till May 25 last year.

## **6. Sand or Dust Storms/Thunderstorms**



Sand and dust storms are common meteorological hazards in arid and semi-arid regions. They are usually caused by thunderstorms – or strong pressure gradients associated with cyclones – which increase wind speed over a wide area. These strong winds lift large amounts of sand and dust from bare, dry soils into the atmosphere, transporting them



hundreds to thousands of kilometres away. Some 40% of aerosols in the troposphere (the lowest layer of Earth's atmosphere) are dust particles from wind erosion. The main sources of these mineral dusts are the arid regions of Northern Africa, the Arabian Peninsula, Central Asia and China. Comparatively, Australia, America and South Africa make minor, but still important, contributions. Global estimates of dust emissions, mainly derived from simulation models, vary between one and three Gigatons per year.

Thunderstorm, a violent short-lived weather disturbance that is almost always associated with lightning, thunder, dense clouds, heavy rain or hail, and strong gusty winds. Thunderstorms arise when layers of warm, moist air rise in a large, swift updraft to cooler regions of the atmosphere.

### **Impacts on human health**

Airborne dust presents serious risks for human health. Dust particle size is a key determinant of potential hazard to human health. Particles larger than 10 µm are not breathable, thus can only damage external organs – mostly causing skin and eye irritations, conjunctivitis and enhanced susceptibility to ocular infection.

Inhalable particles, those smaller than 10 µm, often get trapped in the nose, mouth and upper respiratory tract, thus can be associated with respiratory disorders such as asthma, tracheitis, pneumonia, allergic rhinitis and silicosis.

However, finer particles may penetrate the lower respiratory tract and enter the bloodstream, where they can affect all internal organs and be responsible for cardiovascular disorders.

### **Impacts on the environment and society**

Surface dust deposits are a source of micro-nutrients for both continental and maritime ecosystems. Saharan dust is thought to fertilize the Amazon rainforest, and dust transports of iron and phosphorus are known to benefit marine biomass production in parts of the oceans suffering from the shortage of such elements. But dust also has many negative impacts on agriculture, including reducing crop yields by burying seedlings, causing loss of plant tissue, reducing photosynthetic activity and increasing soil erosion.

Indirect dust deposit impacts include filling irrigation canals, covering transportation routes and affecting river and stream water quality.

Reductions in visibility due to airborne dust also have an impact on air and land transport. Poor visibility conditions are a danger during aircraft landing and taking off – landings may be diverted and departures delayed. Dust can also scour aircraft surfaces and damage engines.

Dust can impact on the output of solar power plants, especially those that rely on direct solar radiation. Dust deposits on solar panels are a main concern of plants operators. Keeping the solar collectors dust-free to prevent particles from blocking incoming radiation requires time and labour.

## **6.1 Western disturbance brings dust storm, thunderstorm in northwest India**

**Source:** hindustantimes.com,10 May,2020

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Thunderstorms may continue over the western Himalayan region and some parts of the northern plains till May 12, according to the India Meteorological Department (IMD)'s Sunday bulletin.



**Commuters seen during rain in the evening, at Vijay Chowk, in New Delhi, India, on Friday, March 6, 2020**

Dust storms and thunderstorms were reported in several parts of northwest India, including Delhi, on Sunday with the weather department attributing them to a western disturbance (WD) and a simultaneous cyclonic circulation.

Thunderstorms may continue over the western Himalayan region and some parts of the northern plains till May 12, according to the India Meteorological Department (IMD)'s Sunday bulletin.

Another fresh western disturbance is likely to affect the western Himalayan region from May 14. It is likely to bring rain and thundershowers to the northern plains on May 15 and 16, the weather department said.

There is also an orange alert for parts of Uttarakhand, Haryana, Chandigarh, Delhi, Punjab, Himachal Pradesh and Jammu and Kashmir for May 13 and 14 when thundershowers and gusty winds are expected. An orange alert implies that agencies should be prepared for extreme weather.

The western disturbance on May 14 will be the fourth such weather event in May. Because of consecutive western disturbances and associated clouds and strong winds, the maximum temperature has not risen in most parts of northwest India as it normally does in this time of the year.

"In Delhi, we record maximum temperature of up to 45 degrees during this time of the year. But this May, we have recorded 40.8 degrees Celsius only yesterday (Saturday). Maximum temperature will fall now by a couple of degrees till the impact of WDs weakens. We are not expecting rain or thundershowers in Delhi on Monday, but it will remain cloudy. The northwesterly winds due to WDs are meeting easterly winds in the lower levels — which is enhancing thunderstorm activity here," said Kuldeep Shrivastava, head, the regional weather forecasting centre.

According to him, the maximum temperature may not peak until May 17. Following the dust storms and thundershowers on Sunday, the maximum temperature in Delhi fell to 35.5 degrees Celsius, four degrees below normal.

"In April or May, the intensity of WDs reduce. There could be many reasons for this unusual pattern of active WDs this year. It could be linked to European climate anomalies because WDs originate in the Mediterranean, mid latitude circulation features may also be impacting," M Rajeevan, secretary, ministry of earth sciences, told HT in April.

Western disturbances are low pressure systems that generally originate over the Mediterranean region and are known to bring winter rain in India. Their intensity reduces in summer when they move to upper latitudes. Scientists say changes in their pattern may be due to weather anomalies in Europe, or they could also be linked to favourable sea temperatures over the Pacific.

Due to a trough (area of low pressure), scattered rain and thundershowers are also likely over central and south peninsular India during next four-five days. Thunderstorms

accompanied with lightning, hail and gusty winds (30-40 kmph) at some places are also likely over these regions in the same period. Heavy rainfall is likely over some places in Kerala and Tamil Nadu on Monday, and over Kerala and Coastal Karnataka on May 13 and 14. Thundershowers will continue over northeast India during next four-five days, the IMD's bulletin added.

## **6.2 Dust storms, light showers and squalls at 60 kmph likely in Delhi-NCR today**

**Source:** hindustantimes.com,29 May,2020

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The national capital along with northern India has been reeling under a severe heat wave for the past one week with temperatures crossing 47 degrees Celsius for five consecutive days.



**The India Meteorological Department (IMD) too on Thursday predicted that the Delhi-NCR region is likely to witness very light rain and dust storms on Friday till about 8:30 pm**

Dust storms, thunderstorms accompanied by light rain and squalls at 60 kmph are likely to occur over Delhi and the National Capital Region in the next 2-3 hours, Dr Kuldeep Srivastava, Head of the Regional Weather Forecasting Centre (RWFC) said on Friday.



The national capital along with northern India has been reeling under a severe heat wave for the past one week with temperatures crossing 47 degrees Celsius for five consecutive days.

The IMD earlier in the week had issued an 'orange' warning for parts of Delhi for a heat wave. A 'red' warning is usually issued for a severe heat wave.

Much of north, northwestern and central India including Punjab, Haryana, Rajasthan, parts of Uttar Pradesh and Madhya Pradesh have also been facing severe heat wave conditions.

Isolated light showers on Thursday evening in some parts of Delhi and adjoining areas, however, brought down the temperature by a couple of notches.

The India Meteorological Department (IMD) too on Thursday predicted that the Delhi-NCR region is likely to witness very light rain and dust storms on Friday till about 8:30 pm.

"Very light rain/thunderstorm/dust storms accompanied with gusty winds is the forecast for Delhi NCR till 8.30 pm," the IMD had said.

"The Southwest Monsoon has further advanced into some parts of Maldives-Comorin area, some more parts of south Bay of Bengal, remaining parts of the Andaman Sea and Andaman and Nicobar Islands.

Conditions are becoming favourable for further advance of the Southwest Monsoon into some more parts of Maldives-Comorin area during the next 48 hours," the IMD said in its All India Weather Forecast Bulletin.

In addition, the IMD said Tripura and Mizoram are also very likely to witness heavy to very heavy rainfall during the next 24 hours.

## **7. Locust Attack**



Locusts are a collection of certain species of short-horned grasshoppers in the family Acrididae that have a swarming phase. These insects are usually solitary, but under certain circumstances they become more abundant and change their behaviour and habits, becoming gregarious.

Locusts form enormous swarms that spread across regions, devouring crops and leaving serious agricultural damage in their wake.

### **What is a locust attack/invasion/plague?**

When the locusts start attacking crops and thereby destroy the entire agricultural economy, it is referred to as locust plague/locust invasion.

### **What is the reason behind locust attack?**

Thus, we have had two meteorological drivers behind the current locust invasions: one, unseasonal heavy rains in the main spring-breeding tracts in March-April, and, two, strong westerly winds.

### **How do farmers deal with locusts?**

Farmers used to try to drive away the locusts by lighting fires. They also dug up the eggs. Now crops can be sprayed with insecticides from vehicles or aeroplanes. Scientists are trying to improve the control of locusts, by preventing or dispersing swarms.

Early-detection infrastructure — surveillance, monitoring and rapid target of nymphal bands of locusts — help in keeping a check on the spread of locusts.

Post-outbreak control measures: Using biopesticides help allay earlier environmental concerns.

## **7.1 India Suffers Biggest Locust Attack in 25 Years, Not Fully Controlled Yet**

**Source:** thewire.in, 23 January, 2020

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Estimates say crops were affected in more than 3.5 lakh hectares in districts of Rajasthan and Gujarat.

**Jaipur:** With estimations saying crops were affected in more than 3.5 lakh hectares in various districts of Rajasthan and Gujarat, the damage caused by locust attacks in 2019-20 is believed to be one of the worst in India.

Crops of mustard, cumin and wheat have been devastated in the two states, affecting lakhs of farmers. In Rajasthan, the worst hit districts are Jaisalmer, Barmer, Jodhpur, Jalore, Hanumangarh, Ganganagar, Bikaner and Sirohi.



Locusts, which are part of the grasshopper family, are highly mobile insects that can migrate across different countries and cause extreme damage to crops.

The Food and Agriculture Organisation (FAO) of the United Nations is the international agency that monitors and manages locust invasions. It says a swarm of locusts, which contains about 40 million insects, can eat the same amount of food in one day as 35,000 people, 20 camels or six elephants.

All locust-affected countries transmit data about attacks to the FAO, where the information is analysed in conjunction with the weather and habitat data and satellite imagery. The organisation also provides forecasts for locust attacks up to six weeks in advance and issues warnings for each country.

The Government of India deploys teams to control locust swarms, which spray a chemical called organophosphate in small, concentrated doses.

### **Tracking the locusts**

In January 2019, the first locust swarms left to Yemen, Saudi Arabia, and south-west Iran, where heavy rains were reported, the FAO said. Between February and June, widespread spring breeding in Yemen, Saudi Arabia and Iran caused the formation of large numbers of locust swarms.

Control operations were less successful in Iran and Yemen and swarms invaded the India-Pakistan border between June and December. In India, the extended monsoon provided a favourable environment for the locusts to multiply.

“Each locust lays about 150 eggs. In fact, they lay eggs only in moist soil, therefore, when they arrived in India, the locusts multiplied uncontrollably because of the extended monsoon here,” S.L. Godara, director (research) at the Swami Keshwanand Rajasthan Agriculture University in Bikaner told *The Wire*.

He said when the locust department, during control operations, track areas where locusts stayed overnight to discover their eggs. “Once found, the chemical is sprayed over the eggs. The spray cannot be used over crops,” he added.

Godara also claimed that since the attack was larger than usual, the department was not efficiently equipped to handle the crisis. “Previously, such a large attack was reported in 1993. But it was still manageable. After that, it never occurred, which turned the locust department inefficient,” he said.

Officers of locust departments in India and Pakistan meet regularly to share information about locusts and potential danger of invasion.

The locust department in India has blamed Pakistan for this year’s attack, saying it failed to conduct control operations successfully. “If Pakistan had taken proper control measures, the breeding of locusts could have been stopped. Due to a longer monsoon in India, the swarms got a favourable environment to breed,” K.L. Gurjar, a participant in the India-Pakistan meeting told *The Wire*. He is also deputy director at the directorate of plant protection, quarantine and storage under the Centre.

The FAO’s January 2020 update shows that the invasion may not have been put to rest yet. “A few residual swarms persistent along both sides of [the] India-Pakistan border where control operations are in progress. Adult and swarms were reported to be breeding along parts of the southern coast where heavy rains and flooding occurred earlier this month [January],” the update said. Godara says locusts usually stay in India until the Kharif season, but this time the swarms haven’t left and are even damaging the Rabi crops.

### **Rajasthan government announces compensation**

Recently, the Rajasthan state government announced compensation worth Rs 31 crore for four affected districts – Jaisalmer, Barmer, Jalore and Jodhpur – after conducting a special assessment of losses.

Farmers whose crop was damaged would be entitled to compensation worth Rs 13,500 per hectare of land. However, the administration has put a ceiling on compensation that can be sought. “Compensation will be given for damage suffered, but not beyond two hectares, irrespective of how much land the farmers have cultivated,” C.L. Goel, additional district collector of Jalore told *The Wire*.



The move to limit the compensation has left the farmers upset. “We have heard that the government will pay compensation for only about two hectares of land, which would roughly be Rs 27,000-30,000. This is insufficient to compensate the losses, as farmers spend about Rs 80,000 to cultivate cumin. We borrow money from local lenders at a higher rate of interest,” Saddam, a farmer from Barmer said.

## **7.2 Locust attack: India faces worst-ever pest invasion**

**Source:** [downtoearth.org.in](http://downtoearth.org.in), 5 February, 2020

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Apart from India, the pests have attacked 60 countries including Pakistan and Somalia, that have declared national emergencies

India is suffering one of the worst locust attacks in its history.

Desert or yellow locusts have raided several districts in Rajasthan and Gujarat. These pests entering from Pakistan had damaged standing crops over 370,000 hectares by January 12, 2020. Pakistan and Somalia have declared emergencies to control the pests.

Locusts are short-horned grasshoppers belong to the family Acrididae. They have big hind legs for jumping. Locusts differ from grasshoppers in that they have the ability to change their behaviour and habits and can migrate over large distances. They are capable of forming ‘swarms’ (adult’s congregation) and ‘hopper bands’ (nymphal congregation).

They live for 90 days and eat voraciously — the equivalent to their bodyweight every day. They feed on green, leafy plants and always travel during the day time. An average adult locust swarm eats as much as about 10 elephants, 25 camels or 2,500 people.

When conditions are favourable for reproduction, locust numbers increase 20-fold in three months. The favourable conditions for breeding include moist sandy or sand / clay soil to a depth of 10-15 cm below the surface, or some bare areas for egg-laying, and green vegetation for hopper development.

Locusts take 50 days to develop from eggs to an immature stage. The immature locusts take another 30 days to reach the egg-laying stage. Once egg laying is done, the insects die.

When conditions are not favourable, their numbers decrease either by natural mortality or through migration. It restricts itself to the semi-arid and arid deserts of Africa, west and south Asia that receive less than 200 mm of rain annually. This is an area of about 16 million square kilometres, consisting of about 30 countries.

In the current case, climate change-induced unseasonal rain or frequent cyclones have been considered to be the main reasons for the infestations. Apart from India, the pests have attacked 60 countries in two major continents, comprising 30 million sq km.

### **7.3 Amid Covid-19 scare, Punjab braces up for locust attack**

**Source:** indianexpress.com,23 May,2020

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**The locust attack has been seen frequently in the past six months in Fazilka's villages, including Roopnagar and Barreka.**

Punjab are already engaged in a battle against Covid-19 and if locust attack takes place, it would be another challenge considering that the state is in the process of sowing paddy and has already completed 50 per cent sowing of cotton.

Amid the spread of coronavirus, Punjab is bracing up for locust attack after warning by the Food and Agriculture Organisation (FAO) of possible egg-laying of locusts and swarm attack in eight districts of Punjab bordering Rajasthan and Pakistan.

The fears have been confounded after a swarm attacked crops in Gharsana in Sri Ganganagar in Rajasthan, 125 km from Punjab's Fazilka during the last few days.

The agriculture department of the state has sounded an alarm to all districts bordering Rajasthan and Pakistan after FAO warnings and attack in the neighbouring Rajasthan.

Fazilka's Sadki block has been put on alert after the swarm was spotted in Rajasthan. The concerns are confounded as locusts can cover a distance of 150 km in a day. The administrations of all districts in

Punjab are already engaged in a battle against Covid-19 and if locust attack takes place, it would be another challenge considering that the state is in the process of sowing paddy and has already completed 50 per cent sowing of cotton.

The locust attack has been seen frequently in the past six months in Fazilka's villages, including Roopnagar and Barreka.

Agriculture Secretary Kahan Singh Pannu told The Indian Express, "The threat is looming large. We have assigned the officials of our department for locust duty. We are fearing that as cotton crop is being cultivated and in a few days paddy nurseries will have enough foliage, the hoppers can attack in Punjab as it will be all green."

He said in view of this, they have set up a Locust Control Room and issued instructions to the Deputy Commissioners of eight districts bordering Rajasthan and Pakistan, comprising Bathinda, Muktsar, Fazilka, Faridkot, Ferozepore, Amritsar, Tarn Taran and Gurdaspur, to prepare to thwart a locust attack.

He said a Locust Control Room was set up centrally and a Joint Director-level officer was made the incharge.

The department was now stocking up pesticides to destroy the locusts if they attack the fields in Punjab. "Our biggest worry is that we do not have open spaces like in Rajasthan which is a desert. Our entire land is cultivated. We cannot use the pesticide – Malathion – recommended by the Centre in as too much of concentration of the chemical is required. We have crops, including foodgrains, cotton and fruits, in these eight districts. We need to stock up other pesticides. We are stocking up, have alerted fire brigades, asked Centre for some more spray pumps and are holding meetings with district administrations," said Gurwinder Singh, incharge of the control room.

The wind direction is being watched, there is a vigil at the border to sound an alarm if locusts are spotted, he said. The kinnow and guava orchards are under threat in Fazilka, and cotton in Bathinda and Muktsar. The paddy season is starting in all other districts.

The paddy is the most paying crop in Punjab that gets the state over Rs 40,000 crore from the Centre. In the Covid-19 situation, the state cannot afford crop losses. The FAO in its warning note to the state has said, "The current situation and forecast are alarming as

locust infestations are expected to extend to other areas in the Horn of Africa and southwest Asia.

In southwest Asia , hopper groups and bands are present in Southern Iran and in Pakistan where substantive control operations continue. Adult groups and small swarms from breeding in Baluchistan , the Indus valley, and Punjab in Pakistan will move to desert areas along both sides of Indo-Pakistan border from now onwards. This is expected to be supplemented by several waves of swarms coming from the spring breeding areas during June.”

The agriculture department has asked the DCs to activate control rooms, set up a system of regular coordination meetings of district revenue, agriculture and Locust Control Organisations (LCOs) for assessment of ground situation, exchange of field information, finalising next day /day’s strategy of control operations.

They have also been asked to make teams of local revenue and agricultural officials for field survey and sharing real-time information, a meeting of all gram pradhans to brief them about the serious forecasts of locusts’ incursion, and sanction and provide survey control vehicles as per requirement given by various LCOs.

It has also asked them to identify the places with coordination of BSF and LCOs where teams will be deployed and assist in temporary camps with basic facilities, including boarding and lodging in border and remote areas in the light of Covid situation.

## **7.4 India under worst locust attack in 27 years: Why you should be concerned**

**Source:** [indiatoday.in](https://indiatoday.in), 26 May, 2020

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Locusts eat food, food that farmers grow for humans. Locust swarms devastate crops and cause major agricultural damage, which can lead to famine and starvation.

Social media has been abuzz this week with visuals of locust swarms descending upon residential areas in Jaipur.

These posts, often shared with doomsday speculations, instil merely a moment's concern. Sure, the millions of insects flying across the sky is not a pleasant sight, but they don't bite humans, so why worry. But worry you should.





**A motorcyclist rides through a swarm of desert locusts in Kenya**



**Locust swarm in Rajasthan's Jaipur**

### **WHAT IS A LOCUST SWARM?**

First, let's understand what locust swarms are and how they damage crops. Locusts are insects that travel in large swarms that can travel up to 150 kilometres in a day depending on the wind speed.

Locust swarms devastate crops and cause major agricultural damage, which can lead to famine and starvation.



Locusts devour leaves, flowers, fruits, seeds, bark and growing points, and also destroy plants by their sheer weight as they descend on them in massive numbers.

A small swarm of the desert locust eats on an average as much food in one day as about 10 elephants, 25 camels, or 2,500 people. But swarms are not always small.

In 1875, the US reported a swarm estimated to be 1,98,000 square miles or 5,12,817 square kilometres in size. Delhi-NCR is only 1,500 square kilometres, for comparison.

A swarm the size of Delhi may consume the same amount of food in one day as every inhabitant in Rajasthan or Madhya Pradesh in one day.

### **LOCUST ATTACKS ARE NOT NEW**

Although it may seem like the year 2020 is filled with unprecedented catastrophes, locust attacks are not new. The only reason many on the internet seem to be surprised by the recent locust swarms is that they have come to India in this proportion after 27 years.

Locust attacks have been mentioned in almost all ancient texts, right from wall paintings on ancient Egyptians pyramids to the Bible and Koran. Ancient Greeks talked about locust attacks and so did Sanskrit poems dating back to 747 BC.

The problem that troubled pharaohs, King Ashoka and King Solomon is still a menace in today's age. Within recorded history, India has witnessed several locust plagues and upsurges since 1812.

### **EXTENT OF DAMAGE LOCUST CAUSED DURING PREVIOUS ATTACKS**

As per the Union Agriculture Ministry data, locusts damaged crops worth Rs 10 crore during the 1926-31 plague cycle. During the 1940-46 and 1949-55 locust plague cycles, the damage was estimated at Rs 2 crore per cycle, and at Rs 50 lakh during the last locust plague cycle (1959-62).

The government does not consider locust upsurges during 1978 and 1993 and several in-between as major outbreaks. But as per the government records, 190 locust swarms had attacked an area of at least 3,10,000 hectares in Jaisalmer, Barmer, Bhuj and Jalore districts of Rajasthan in 1993. Large areas in these districts again had to be treated with chemicals to get rid of locust swarms in 1997 and 2005.

### **WHAT'S NEW THEN**

Most of the attacks by locust swarms in India since 1993 have been localised to Rajasthan. But this time, favourable weather conditions have facilitated locusts' travel from Rajasthan to Gujarat, Madhya Pradesh, Uttar Pradesh and even Maharashtra.

Reports of crop damages have been pouring in from these states as farmers try and get rid of locusts by smoking them out, scaring them away by making loud noises or spraying chemicals.

India has a specialised Locust Warning Organisation, headquartered in Jodhpur. The centre is responsible for timely monitoring and planning for locust eradication and providing assistance to state governments in controlling invasions.

The state and central machineries, including the LWO, are actively trying to get rid of the locusts invading India through Pakistan, but their efforts may not be enough.

### **WORST YET TO COME**

The locust swarms currently plaguing Indians crops bred and matured in Iran and Pakistan's Balochistan. But larger swarms that bred in Horn of Africa and parts of the Arabian Peninsula, due to abnormal weather activities caused by two cyclones in 2018, are also likely to move towards India soon.

The United Nation's food and agriculture organisation (FAO) has warned India of an impending locust invasion. As per the FAO, the locust infestation is likely to get severe by next month. The desert locust invasion is expected to move from East Africa to India and Pakistan next month and could be accompanied by other swarms. The FAO's Senior Locust Forecasting Officer Keith Cressman said: "Everybody knows we're facing one of the worst desert locust situations that we've probably had in a number of decades".

### **WHY YOU SHOULD CARE**

Locust swarms eat food, food that farmers are growing for humans. If locust attacks of this proportion continue unabated, the insects will wipe out lakhs of tones of food grains and vegetables meant for human consumption.

Apart from a possible lack of food grains and vegetables, locust attacks on farms will also plunge India into fresh economic trouble.

Plagued by an economic slowdown and Covid-19 lockdown, the Indian economy is already on the edge. While experts hope that things will improve after a vaccine for the novel coronavirus comes into the market, an agrarian crisis due to locust attack will throw the government's plans off-balance.

More relief packages will have to be announced and more money will have to be taken out of government coffers, less and less revenue will be generated and food inflation will skyrocket as supply will fall below demand.

In short, even if you are sharing the locust videos from the safety of your airconditioned living room, you should be worried that it may cost you much more to put food on the table in the coming days.

### **7.5 First major locust attack in Maharashtra since 1993; 3 districts hit**

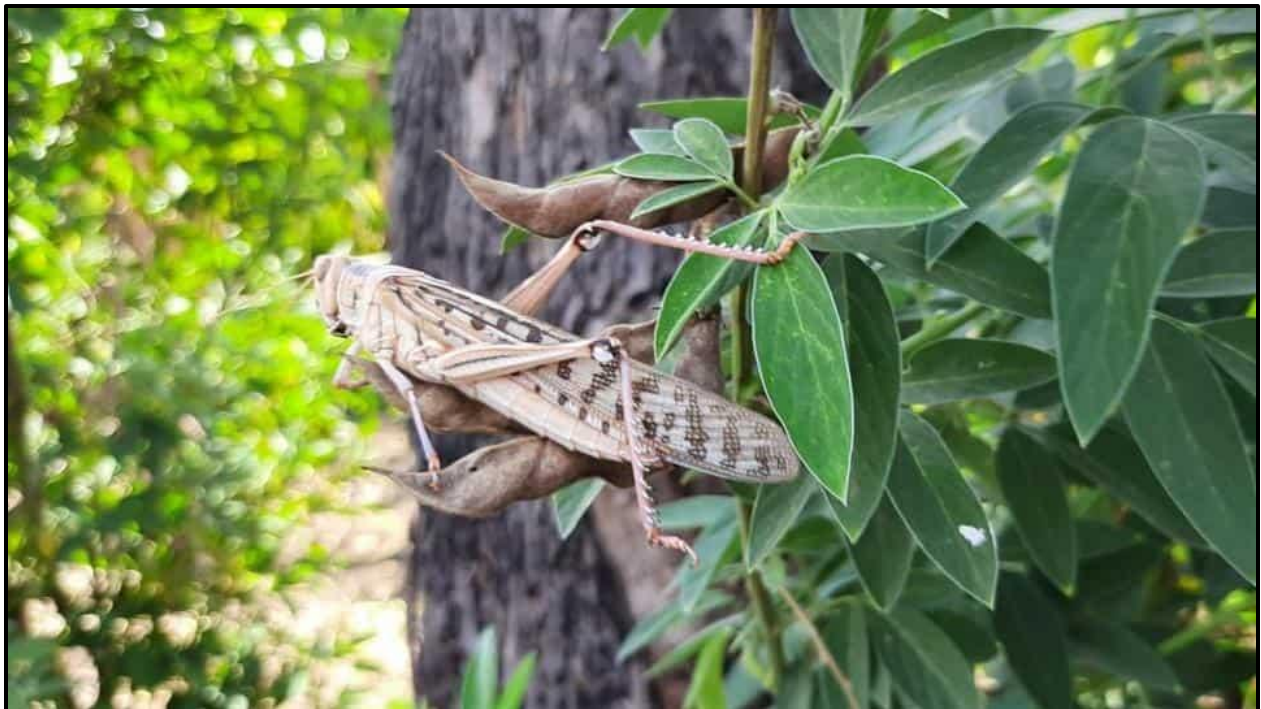
**Source:** hindustantimes.com, 27 May, 2020

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According to the state agriculture department, the swarm is reported to be at least 10-km-long and two-km-wide, which has covered a distance of around 120km between May 24 and 26, and it continues to spread.

Maharashtra is facing its first major locust invasion since 1993, with a swarm of short horned grasshoppers having invaded six talukas across three districts — Amravati, Wardha and Nagpur — in Vidarbha.

While major food crops are not under threat, fruit orchards and vegetable farms are likely to be affected.



**The locusts have invaded six talukas across three districts — Amravati, Wardha and Nagpur — in Vidarbha**

According to the state agriculture department, the swarm is reported to be at least 10-km-long and two-km-wide, which has covered a distance of around 120km between May 24 and 26, and it continues to spread.

The main affected areas include 22 villages across Morshi and Warud talukas in Amravati; Ashti taluka in upper Wardha district; and Katol, Kalmeshwar and Narkhed talukas in Nagpur.

“The invasion began from Katol on Monday morning. While major crop damage is not expected since we are close to monsoon and sowing in these areas begins by June 7, but orange orchards are threatened by the invasion. A 25% loss is being estimated for those owning these orchards,” said Ravindra Bhosale, divisional joint director agriculture, Nagpur division.

“The swarm is now moving further deeper into rural areas of Nagpur division. At Kalmeshwar taluka, on Tuesday, we were informed of damage to vegetable crops across 5-6 hectares,” said Bhosale.

The last time Maharashtra witnessed such an invasion was in 1993 in Dhule district, the Locust Warning Organisation (LWO) under the Union agriculture ministry said.

“An escaping population of desert locusts made their way from Madhya Pradesh into Amravati district on May 24 owing to the current wind direction and the presence of forest patches where they can grow and breed. Over 48 hours, they have covered two more districts, showing an unusual swarming behaviour,” said Dr KL Gurjar, deputy director and national coordinator on mitigating locust attacks, LWO.

Subhash Nagade, divisional joint director agriculture, Amravati division, said, “There is fear and panic among villagers and farmers. With the Covid-19 pandemic underway and extremely hot weather in Vidarbha, the locust outbreak has made the situation worse. We are working with the municipal authorities for awareness drives across all affected areas.”

Between Monday night and early Tuesday morning, district officials with the help of the fire department carried out a six-hour drive to kill the locusts by spraying pesticides on the affected areas in all three districts.

“We learnt that the swarms move during the day and sleep on the fruit bearing citrus trees at night. Villagers informed us about their exact locations, and an overnight extermination drive saw thousands of dead insects across a 17-km stretch at Katol. However, on Tuesday morning, those that survived began swarming other talukas,” said Bhosale. Nagade said a similar thing was witnessed in Amravati.

“The swarm has reduced here and moved towards greener pastures in Wardha and Nagpur. However, we fear the possibility of another swarm making its way from MP,” he said.

“We are constantly in touch with local officers overseeing this. We expect the invasion to be controlled within a few days in Maharashtra.

However, another escaping population from MP cannot be ruled out,” said Gurjar The country is witnessing a severe locust outbreak active across Rajasthan, Gujarat, Uttar Pradesh, Madhya Pradesh, and now Maharashtra.

These rapidly reproducing crop munching pests can eat daily amounts equal to its weight, and can fly up to 150km in a day.

Central and state bodies have stepped up efforts to control the menace as it poses crop vulnerability and threat to food safety if the outbreak is not contained.

## **7.6 Overnight operations in Jhansi to clear swarms of locusts**

**Source:** [newindianexpress.com](https://www.newindianexpress.com), 28 May, 2020

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Instructions have been issued to officials to list elaborate details about the dangers posed by locusts and precautions need to be taken.



**A swarm of locusts**



JHANSI: Overnight operations were carried out by the administration and agriculture department to clear swarms of locusts in Moth and Garautha areas of the district here, official said on Thursday.

A large number of locusts has been eliminated with spraying of chemicals all through the night but a smaller number of those who survived has moved towards Pariksha near Jhansi on Thursday morning, Deputy Director, Agriculture, Kamal Katiyar, said Their further movement would depend on the direction of the wind, he said.

Senior officials including those from a central team were present during the night-long operation and a close vigil is being maintained on further movement of locusts, Katiyar said.

Two fire brigade vehicles loaded with insecticide had been deployed in all four Jhansi tehsils besides six vehicles were kept ready at the district headquarter.

Ten municipal employees with two insecticide spraying machines were posted in every block.

Locusts had earlier attacked some parts of Jhansi district on May 22 and 24.

Taking cognizance of the matter, Chief Minister Yogi Adityanath had on Wednesday issued directions to district magistrates of bordering districts of the state to take appropriate measures to deal with the menace.

Instructions were issued to DMs of Jhansi, Lalitpur, Agra, Mathura, Shamli, Muzaffarnagar, Baghpat, Mahoba, Banda, Chitrakoot, Jalaun, Etawah and Kanpur Dehat.

At the state level, teams have already been formed and control rooms established to track the movement of locusts.

At the district headquarter level, a nodal officer has been appointed, and a task force and control-room already set up.

Instructions have been issued to officials to list elaborate details about the dangers posed by locusts and precautions need to be taken.

These instructions should be circulated to all officials in districts through social media, and should also be made available to farmers and the common public.

An advisory was also issued to beat drums, tin containers, metal plates and create noise to shoo the locusts in case of an attack.

The officials of the agriculture department have been told to coordinate with members of the Locust Warning Team, locals and farmers.

Instructions have already been issued to take assistance of agriculture universities and pest management centres.

### **7.7 Locust attack: Nine Odisha districts under alert, officials asked to keep vigil**

**Source:** [downtoearth.org.in](http://downtoearth.org.in), 3 June, 2020



The government has started control rooms at state- and district- levels to ward off locusts

At least nine districts in Odisha are reportedly under threat of locust invasion, according to state government officials.

In a bid to prepare for the worst, the Odisha government on June 2, 2020 asked its officials to keep a vigil on the locust situation for at least next 10 days. It also directed them to spray medicines, if needed, on crops with the help of fire services.

The districts under threat include Nabarangpur, Nuapada, Kalahandi, Malkangiri, Koraput, Rayagada, Jharsuguda, Sundargarh and Bargarh.

States such as Rajasthan, Uttar Pradesh and Madhya Pradesh are already battling out the worst locust invasion in over 27 years.

A decision in this regard was taken at a high-level meeting in the office of the Chief Minister Naveen Patanaik. It saw top officials, including Chief Secretary Asit Tripathy, Development Commissioner Suresh Mohapatra, Special Relief Commissioner Pradeep Kumar Jena, Farmers' Empowerment Secretary Saurabh Garg and Fire Services Director-General Satyajit Mohanty, in attendance.

The members were informed that an army of locusts invaded crops in Chhattisgarh on June 1 before reportedly returning to Madhya Pradesh. There was speculation that the swarm may turn to Odisha. The government has started control rooms at state- and district- levels to ward off locusts, according to agriculture officials.

“The department has sent six lakh WhatsApp messages to more than eight lakh farmers to make them aware of the impending danger,” said a senior official. Farmers have been advised to create noise by beating utensils or tin boxes to drive the locusts away. They have also been asked to spray neem-based insecticides.

The locusts have raided crops in Maharashtra, Rajasthan, Uttar Pradesh, Madhya Pradesh and Chhattisgarh so far. According to agriculture department officials, the pests are expected to enter Odisha from western states. Crops and trees in Bargarh, Sundargarh, Kalahandi and Balangir district are likely to be most vulnerable, they added.

Officials fear that locusts may also attack paddy crop, harvesting of which is underway in a few districts. Bargarh district, known as the ‘rice bowl’ of Odisha, shares its border with Chhattisgarh. A sizable part of paddy crop has yet to be harvested there.

The Bargarh district agriculture officials have reportedly created a WhatsApp group for all the 253 Gram Panchayats to share all relevant information. The department has also distributed leaflets among farmers.

## **7.8 Locust attack: Bigger swarms to enter India by June end**

**Source:** timesnownews.com,6 June,2020



The Locust Control Organization is expecting bigger swarms by June end, coinciding with the sowing season. The authorities are not only worried about locusts but also about the after-effects of pesticides.

Jaipur: Locust swarms continue to enter India from across the border from Pakistan. Latest swarms have been observed in Nokha and Deshnok in Bikaner

this week while Barmer and Jaisalmer continue to receive swarms of small proportions. Experts say that there has been a widespread breeding of locusts in East African countries and in Pakistan, and these swarms are expected to hit India by the end of June. Sources believe that these locust swarms are going to be larger than ever before. “We are keeping a close watch on the situation and sharing information with the affected state authority.” KL Gurjar Head of Locust Control Organization in Jodhpur said.

Meanwhile, the Union Home Ministry has notified that the states would be able to use fund allocated under State Disaster Relief Fund (SDRF) and National Disaster Relief Fund (NDRF) for locust control activities.

The Rajasthan government has already moved to allocate Rs 1.47 crore to district collectors for purchase of a hundred fire tenders which would be used for locust control also. The Gehlot government has also authorized the district collectors to hire the tractor-mounted sprayers and purchase of insecticide as per the local need. Recruitment of 290 assistant agriculture officers and 1,900 observers will also be done in Rajasthan.

“There will be no paucity of fund for locust control activities. We are working on a district-wise strategy to control the future attacks which are imminent,” said Ashok Gehlot, the Chief Minister of Rajasthan.

But farmers in Rajasthan are a worried lot as the next wave of locust swarm will coincide with the sowing of Kharif crop. Maize, millet, sorghum are the major Kharif crop in Rajasthan while the state also produces large quantities of pulses in this season. As many as 23 districts of Rajasthan have been affected by the locust swarms.

The swarms which have entered India in the last ten days are flying further into the hinterland towards the east and south-east. According to the officials, 43 districts of five states have been severally affected by the attack of locust swarms in the month of May 2020.

This includes 23 districts of Rajasthan, 16 of Madhya Pradesh, Banaskantha and Kutch in Gujarat, Fazilka in Punjab and Jhansi in Uttar Pradesh.

But environmentalists are concerned about the widespread use of pesticide to kill the locust swarms. Experts say that indiscriminate use of pesticides will also affect the fauna such as birds, butterflies and other beneficial insects and could also prove cancerous to human beings in extreme cases.

“We have seen in states like Punjab that diversity of birds and insects have gone down over the years due to the high use of pesticide and insecticide. We need to control locust swarms but should also focus that measures we adopt today has its detrimental side effects and after-effects.” Simrat Sindhu member of Rajasthan wildlife board said.



## **7.9 Fresh locust attack reported from UP, Maharashtra, Rajasthan**

**Source:** hindustantimes.com, 11 June, 2020

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### **A child attempts to chase away a swarm of locusts over a field in the outskirts of Prayagraj on Wednesday**

Over the past two to three days, the wind direction has been favourable for locusts to move towards farmlands adjoining forests towards Nagpur, said Locust Warning Organisation deputy director KL Gurjar.

Swarms of desert locust have entered farm land in Nagpur in Maharashtra and Prayagraj in Uttar Pradesh, even as the worst affected Rajasthan has decided to send agriculture officers to districts to monitor the damage to crops and prepare for the next round of locust attack expected by mid-July.

Over the past two to three days, the wind direction has been favourable for the pests to move towards farmlands adjoining forests towards Nagpur, said Locust Warning Organisation deputy director KL Gurjar.

In UP's Prayagraj, a swarm entered the villages of Koraon and Meja development blocks. "We are trying our best to chase them away," said Akansha Rana, SDM, Karchana.



## **7.10 Locust swarm reaches Agra, attacks 35 villages in district**

**Source:** [indiatoday.in](http://indiatoday.in), 30 June, 2020

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### **The locust swarm reached Agra on Monday night**

The Agra district agriculture department had sprayed pesticides in the fields but it did not have much effect on the locust.

After attacking villages in Rajasthan and Madhya Pradesh, the locust swarm entered Agra on Monday evening, attacking villages in Firozabad, Mathura, Bah and Pinahat tehsils of the district.

By late evening, the swarm had spread over most of Agra and farmers spent the entire night and most of Tuesday morning making noises and lighting fires in their fields to ward off the locusts with smoke. However, despite these efforts, the locusts settled down in at least 35 villages on Monday night.

The district agriculture department had sprayed pesticides in the fields in these villages but it did not have much effect on the locust.

Villagers in Agra said this is the first time that the young generation has seen a locust attack. 104-years-old Imamuddin, a local resident, said in earlier times people used to

primarily grow Arhar (a type of pulses) and if there was a locust attack, they spray a mixture of cow dung and water over the crops and smoked the fields with cow dung cakes. "This irritated the locusts and they would fly away," he said. However, this time the standing crop of bajra has been badly affected by the locusts.

The locust swarm have also attacked the central Paliwal Park of Agra and severely damaged the trees and plants there.

District Horticulture Officer Dr Ram Pravesh Verma said the swarm comprised about 200 crore locusts, spread in an area of 10-12 km.

Keeping in view of the size of the swarm, pesticides were sprayed at the Taj Mahal and other some parks using four fire tenders and 10 tractors. However, the locusts still damaged the greenery.

## **8. Covid 19**

Coronavirus disease 2019 (COVID-19) is a contagious respiratory and vascular disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). First identified in Wuhan, China, it has caused an ongoing pandemic. COVID-19 affects different people in different ways. Most infected people will develop mild to moderate illness and recover without hospitalization.

### **Symptoms :**

Common symptoms include fever, cough, fatigue, breathing difficulties, and loss of smell and taste. Symptoms begin one to fourteen days after exposure to the virus. While most people have mild symptoms, some people develop acute respiratory distress syndrome (ARDS), which can be precipitated by cytokine storms, multi-organ failure, septic shock, and blood clots. Longer-term damage to organs (in particular, the lungs and heart) has been observed, and there is concern about a significant number of patients who have recovered from the acute phase of the disease but continue to experience a range of effects—known as long COVID—for months afterwards, including severe fatigue, memory loss and other cognitive issues, low grade fever, muscle weakness, and breathlessness.

### **Transmission :**

COVID-19 mainly spreads through the air when people are near each other long enough, primarily via small droplets or aerosols, as an infected person breathes, coughs, sneezes, sings, or speaks. Transmission via contaminated surfaces has not been conclusively demonstrated. It can spread as early as two days before infected persons show symptoms (presymptomatic), and from asymptomatic (no symptoms) individuals. People remain infectious for up to ten days in moderate cases, and two weeks in severe

cases. The standard diagnosis method is by real-time reverse transcription polymerase chain reaction from a nasopharyngeal swab.

### **Preventive measures :**

It include social distancing, quarantining, ventilation of indoor spaces, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face. The use of face masks or coverings has been recommended in public settings to minimise the risk of transmissions.

There are no proven vaccines or specific treatments for COVID-19 yet, though several are in development. Management involves the treatment of symptoms, supportive care, isolation, and experimental measures.

## **8.1 Coronavirus cases cross 235 in India; offices shut in Mumbai, strict restrictions in Delhi**

**Source:** [financialexpress.com](https://www.financialexpress.com), 20 March, 2020

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Coronavirus Cases In India: Several fresh positive cases of Coronavirus were reported today taking the total number to over 235. The Maharashtra government has ordered closure of offices, shops in Mumbai, Pune and Nagpur till March 31.



**All shops, except those selling essential commodities, have been asked to remain close till March 31 in Mumbai, Pune and Nagpur**

Coronavirus News: With several new cases of Coronavirus being reported from across the country, several cities have announced virtual lockdown to stop the spread of the deadly infection. Metro services in Delhi, Metro, Bengaluru will not be available on Sunday, March 22 – the day PM Modi has called for Janata Curfew. Jaipur Metro has stopped services till Sunday with immediate effect.

The Maharashtra government on Thursday announced closure of offices and shops in Mumbai, Pune and Nagpur till March 31.

Shops selling essential commodities will only remain open in these cities. Train services across the country would remain curtailed on Sunday.

A number of passenger trains have been cancelled. The number of Coronavirus case continues to jump in India as the government has stepped up preventive measures to prevent the virus from creating more damage to the Indian economy and society.

As of today, there are as many as 236 cases reported in the country out of which 32 are foreign nationals while the rest of them are Indians.

Indian health officials and doctors have been able to cure 19 people who were infected with the COVID-19 but could not save the lives of 4 people.

Prime Minister Modi on Thursday addressed the nation in a bid to bring calmness to the people of India amid the increasing rage from the Coronavirus.

He urged the countrymen to go for a self-imposed curfew- Janata Curfew to bring about isolation in our society, which is very much essential part of containment against the Coronavirus.

The government has also announced that no commercial international flights will be allowed to land in India from Sunday, March 22 for a week as cases of Coronavirus continue to rise in the country.

In developments today, the University Grants Council (UGC) asked universities to postpone exams till March 31. Also, CBSE, ICSE board class 10,12 exams have been postponed till March 31.

In view of the COVID-19 outbreak, Sebi has given a 45-day extension to companies for filing Q4 results — this is a month-long grace for filing FY20 results due to coronavirus pandemic.

## 8.2 India coronavirus, COVID-19, March 29: India's confirmed cases jumped from 5 on March 2, to 1,000 cases on March 29

Source: zeenews.india.com, 29 March, 2020



The coronavirus pandemic has engulfed the entire world and has posed serious challenges for the health and economic security of millions of people worldwide. In India too, the spread of coronavirus has been alarming.

The total number of COVID-19 cases in India on Sunday morning reached 918 out of which 819 are active cases, 79 recovered, 19 deaths and 1 migrated patient. as per Ministry of Health.

The coronavirus pandemic has engulfed the entire world and has posed serious challenges for the health and economic security of millions of people worldwide. In India too, the spread of coronavirus has been alarming.

The total number of COVID-19 cases in India on Sunday reached 979 out of which 867 are active cases, 86 recovered, 25 deaths and 1 migrated patient, as per Ministry of Health.

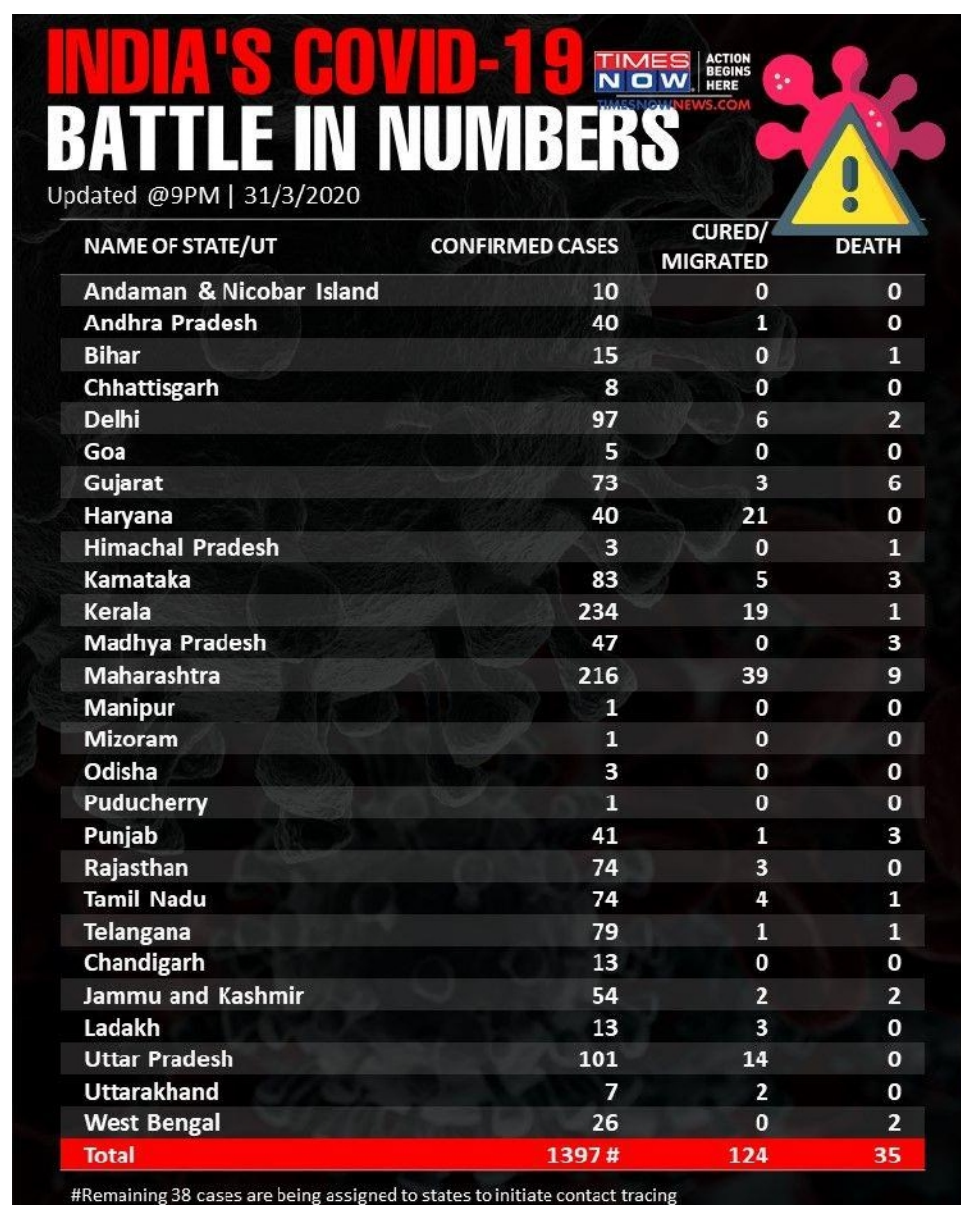
In the wake of rising challenges due to the coronavirus COVID-19 pandemic, Prime Minister Narendra Modi on Saturday announced the Prime Minister's Citizen Assistance and Relief



in Emergency Situations Fund' (PM CARES Fund), a public charitable trust. The fund has been set up so that the people who want to contribute can do so by following a few simple steps which will help the government tide over the major COVID-19 hurdle.

### 8.3 Coronavirus cases in India: 1,397 confirmed COVID-19 cases, 35 deaths, 1,238 active cases as on March 31 @9 pm

Source: timesnownews.com, 31 March, 2020



New Delhi: Cases of coronavirus are rising at an exponential rate, faster than experts and scientists had anticipated a couple of months ago. The 'novel' virus has so far infected around 786,000 people across the world, and close to 38,000 people have succumbed to the Covid-19 pandemic so far.

India has seen a sudden spike in cases over the past couple of days, with 146 people testing positive in just the past 24 hours.

As per the latest bulletin released by the Ministry of Health & Family Welfare, Kerala and Maharashtra have the maximum number of cases at 234 and 216, respectively. Delhi (97), Karnataka (83), Rajasthan (74) and Uttar Pradesh (101) are the other badly-affected states.

Almost all countries and territories in the world have positive Covid-19 cases, the worst affected being the United States of America, Italy, Spain, China, Germany, France, Iran, and the United Kingdom.

The pandemic broke out in Wuhan in China's Hubei province three months ago but has spread across the entire world in less than two months of the first reported case.

The World Health Organisation had declared it a pandemic over a

month ago and issued strict guidelines of hygiene and social distancing. However, several people across the world, including India, continue to defy the directives and put others' lives at risk, as the only way to contain the spread of Covid-19 is by distancing oneself from others.

Since there is no vaccine for the disease so far, the recovery rate of patients testing positive is very low due to the rapid rate of mutating of the virus in the host.

With a population of 130 crore people, India is extremely wary of the impact of the pandemic in case it hits at the rate it has in Europe and the US.

Prime Minister Narendra Modi on March 24 announced a complete lockdown in all states and Union Territories across India for 21 days. Barring essential supplies such as food and medical emergencies, people have been advised to stay indoors.

## **8.4 Covid-19: What you need to know today**

**Source:** hindustantimes.com,13 April,2020

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Till March 23, there were 499 Covid-19 cases in India. The number rose to 2,543 till April 2. On April 12, the count stood at 9,191. The death toll rose from 10 to 72 to 326 in this period.

As India nears the 10,000 cases mark — Covid-19 infections touched 9,191 on Sunday, and there have been 326 deaths so far — it is clear that the virus is still following its own trajectory in India. Many scientists expected that this would change at some point. It hasn't (and to celebrate, this column is going to be repetitive, but with fresh numbers).



**People maintain social distance at a food distribution by Gurdwara Sis Ganj Sahib on day nineteen of the 21 day nationwide lockdown to check the spread of coronavirus, at Chandini Chowk , in New Delhi**

Till March 23, there were 499 Covid-19 cases in India. The number rose to 2,543 till April 2. On April 12, the count stood at 9,191. The death toll rose from 10 to 72 to 326 in this period.

Till March 8, there were 541 cases in the US. The number rose to 9,296 till March 18 and 124,256 till March 28. On Sunday, the count was 545,830. The death toll rose from 22 to 150 and then 2,222. On Sunday, it stood at 21,474.

Or Italy. Till February 27, the number of cases in Italy was 593. This rose to 5,061 till March 7 and 26,062 till March 17. The death toll rose from 17 to 233 to 2,503 in this period. On Sunday, the count was a total of 156,363 cases and 19,899 deaths.

There is no need to get into the math — the Indian curve is a lot shallower, in terms of both infections and deaths. One explanation is that India is not testing as much as some of these countries have done.

Italy has tested 15,935 per million of its population; the US 8,138; and India 137. To be sure, both the US and Italy were laggards in testing to begin with, and then aggressively ramped up as they realised the danger posed by the pandemic.

All the numbers, other than the India tally as of Sunday evening are from the website [worldometers.info](https://www.worldometers.info/). The latest Indian numbers are from HT's dashboard.

It is a fact that India has tested far too few people (the numbers will increase once the rapid test kits arrive). This could mean that there are a lot of infected people out there. Many of them may be symptomatic, but at least some will require hospitalisation, advanced care, perhaps in critical care units, and, some of them may even die. Anecdotally at least, there's no sudden surge in non-Covid mortalities in India that suggests that the disease is silently stalking people in the country's hinterland.

Clearly, India's trajectory is mystifying and needs deeper scientific research. This column has previously pointed to at least three themes being studied by scientists — the impact of temperature and humidity on Sars-Cov-2, the virus that causes Covid-19; the strain of the virus; and the relationship, if any, between immunity to the coronavirus disease and the BCG vaccine.

The coverage of the vaccine is almost universal in India, and Indian children have been given it since the late 1940s. There's more anecdotal evidence about the seeming immunity of those given the BCG vaccine to Covid-19. Spain (163,027 infections 16,606 deaths and 7,593 per million tested) gives the vaccine to children in only one region. The vaccine is universally given in Portugal (15,987 infections, 470 deaths, and 15,966 tests per million). The results of a large experiment involving frontline health care workers in Australia are awaited (they have been given the BCG vaccine).

The findings will be closely studied — especially in India, where the government is working to find a way to protect lives as well as livelihoods affected by the ongoing lockdown.

That won't be easy — a quarter of India's cases are from its two most important cities from the perspective of business, Delhi and Mumbai. Gurugram, home to the local HQs of many Fortune 500 companies, has several hot spots too. It will be a while before it is business as usual in all three.

## **8.5 74% of India's Covid-19 cases reported in May**

**Source:** [hindustantimes.com](https://www.hindustantimes.com/), 23 May, 2020

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India's Covid-19 cases rose 11 per cent over the past two days to 125,101, according to Saturday morning's data from the ministry of health and family welfare (MoHFW).



**By Saturday evening, Maharashtra which is the worst hit state, recorded 2,608 new Covid-19 cases to take the state's tally to 47,190.**

Between Monday morning and Saturday morning the number of cases has gone up by 30 per cent. This is also in line with the rate of growth when compared to the previous five days.

By Saturday evening, Maharashtra which is the worst hit state, recorded 2,608 new Covid-19 cases to take the state's tally to 47,190. Mumbai accounts for 28,817 of those cases.

Maharashtra's death toll now stands at 1,577.

The number of Covid-19 infections and fatalities in the country has risen rapidly this month at a rate faster than in other countries that have been hit badly by the virus. Other than Maharashtra, the states of Tamil Nadu, Gujarat, Delhi, Uttarakhand and Assam have reported a sharp rise in Covid-19 cases this month.

Although India reported its first case on January 30, around 74% of India's total cases have been reported in May alone.

## **8.6 June shoot of Covid-19: Growth of raging coronavirus in India**

**Source:** [indiatoday.in](http://indiatoday.in), 15 June, 2020

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June has been tough for India. The issue of migrants and a worsening economic situation forced central and state governments to exit the coronavirus lockdown. This period has coincided with a shoot in Covid-19 numbers.

Since the turn of June, Covid-19 numbers have gone from 1.76 lakh to 3.32 lakh, recording an absolute rise of 1,55,772 cases of the novel coronavirus as of June 15 morning. On its own, the absolute addition would make a country a member of the worst-10 affected countries group.

In percentage terms, the prevalence of Covid-19 in India has seen an increase of over 88 per cent in just two weeks.





### **People spending their evening on the promenade at Marine Drive in Mumbai on June 14**

Most of these surging new cases have come from Maharashtra, Tamil Nadu and Delhi. Maharashtra saw an increase of 42,793 cases in the month of June, rising from 65,000 to about 1.08 lakh.

Tamil Nadu more than doubled its tally during this period. It had 21,184 cases on May 31. Those have now gone up to 44,661 - an increase of 23,477 cases or over 110 per cent of caseloads.

Delhi too recorded a similar rise of 22,633 cases, or over 122 per cent. Together, these states added 88,903 fresh cases in June itself. This number makes over 57 per cent of the total rise in India's Covid-19 caseload in June.

To put this in perspective, Maharashtra, Tamil Nadu and Delhi have added more cases of Covid-19 during June than the entire caseload of China since the outbreak of coronavirus pandemic sometime in November-December last year.

### **INDIA VERSUS WORSE**

Globally, India was placed at the eighth place on May 31 having already overtaken France and Turkey. India is now placed fourth after the US, Brazil and Russia. But in terms of fresh cases in June, India is placed third.

Russia with the more than double the size of India's base caseload on May 31, added more than 52,000 fewer Covid-19 patients in the two weeks of June. The UK added 22,000 cases while India overtook it during the period.

Germany, Italy and Spain added only 4,000-5,000 cases with a bigger base than India. Spain has a unique scenario. It revised both its caseloads and death toll numbers downward stating it had wrongly identified cases as Covid-19.

As for death toll, India has recorded third highest death toll due to Covid-19 in the first half of June after Brazil and the US. Brazil registered nearly 13,950 Covid-19 deaths, the US 13,899 and India 4,356 during the period.

## **IN THE COURTYARD**

India's June death toll is over 45 per cent of total deaths due to the coronavirus pandemic. Of the total Covid-19 deaths (9,520 as of June 15 morning), around 41.5 per cent has happened in Maharashtra (3,950).

Including Gujarat (1,477) and Delhi (1,322), the three states account for almost 71 per cent of total Covid deaths in the country. These three states have added 3,634 to the overall death toll in June in India. That is about 83.5 per cent of total deaths India has recorded due to Covid-19 pandemic.

The silver lining, however, for India in the dark clouds of coronavirus pandemic is that India has upped its recovery rate beyond 50 per cent. On May 31, India has a recovery rate of 49.2 per cent with 86,980 recoveries. Now, it is over 51 per cent with nearly 1.7 lakh recovered patients of Covid-19. All India figures are from Aarogya Setu app database.

But why did India see this rise in June?

According to a study by an ICMR mandated group, it might have something to do with the coronavirus lockdown. The study found that lockdown shielded India from an immediate outburst of Covid-19 pandemic.

The ICMR research group estimates that the lockdown delayed coronavirus peak by anywhere between 34 and 76 days. So, if the earlier estimate of the Covid-19 cases peaking in July is taken as the departure line, the new peak may now be seen sometime in November.

The researchers estimate that at the peak numbers, India may face a shortage of isolation beds for 5.4 months, ICU beds for 4.6 months and ventilators for 3.9 months.

However, all these projections are based on the current trends - of government intervention, infectivity of the virus, discipline of people and ramping up of tools to fight back a raging pandemic.

### **8.7 India coronavirus numbers explained: New peak powered by southern states**

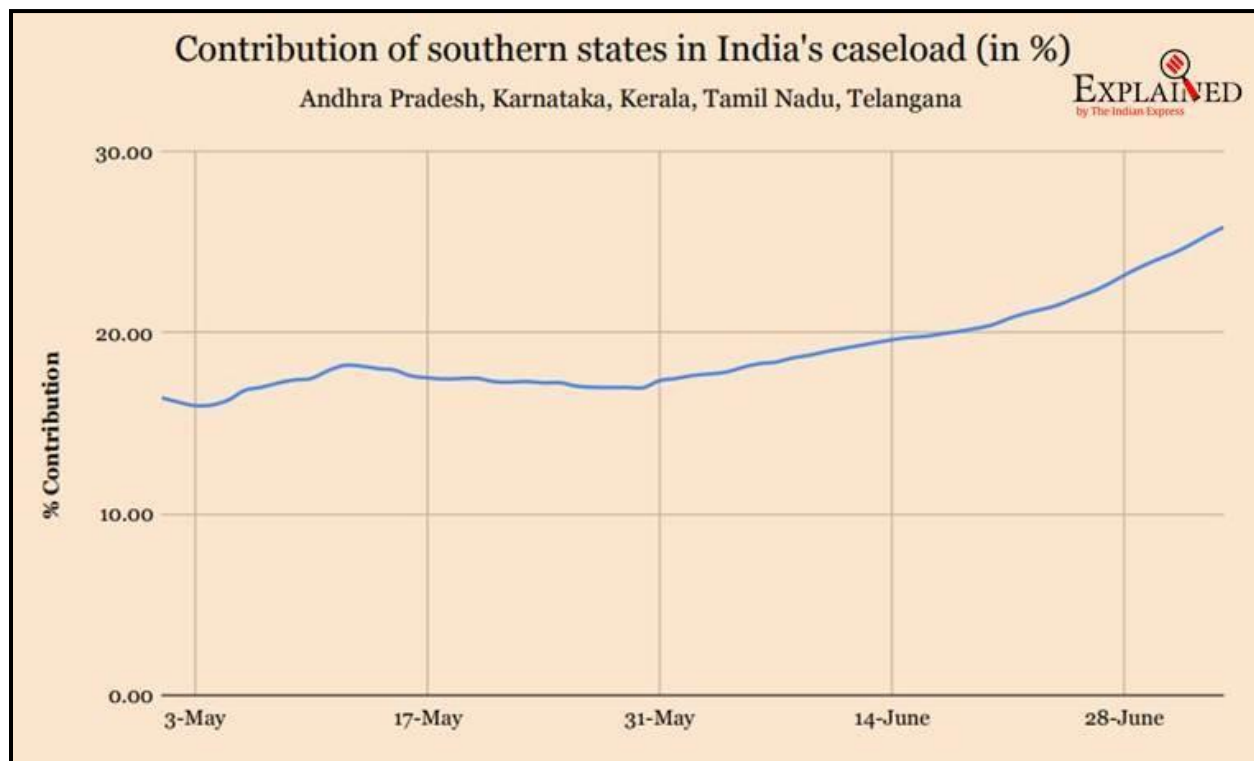
**Source:** indianexpress.com ,7 July,2020

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India Coronavirus Cases Numbers: The surge in Karnataka and Telangana, and also in Andhra Pradesh, along with consistent high numbers from Tamil Nadu has ensured that the contribution of the five southern states has gone beyond 25 per cent.

India Coronavirus Numbers: India was poised to overtake Russia and become the country with the third-largest caseload in the world, as another day's surge in the southern states took India's novel Coronavirus numbers to a new peak on Saturday. As close to 25,000 new infections were added on Saturday, India's caseload reached 6.73 lakh, just a few hundred less than that of Russia. The United States, with more than 28 lakh cases, and Brazil, which has more than 15 lakh, are the only two countries with bigger caseloads than India. Saturday's record number was once again powered by the five southern states, each of which is witnessing a growth that is faster than the national growth rate (7-day compounded daily growth rate). The surge is coming mainly from Telangana and Karnataka, each of which reported more than 1,800 new cases on Saturday, and moved up another ladder in the top ten list of states with highest caseloads in the country.

<b>STATE</b>	<b>TOTAL POSITIVE</b>	<b>NEW CASES</b>	<b>TOTAL RECOVERIES</b>	<b>DEATHS</b>
<b>Maharashtra</b>	200,064	7,074	108,082	8,671
<b>Tamil Nadu</b>	107,001	4,280	60,592	1,450
<b>Delhi</b>	97,200	2,505	68,256	3,004
<b>Gujarat</b>	35,398	712	25,414	1,927
<b>Uttar Pradesh</b>	26,554	757	18,154	773
<b>Telangana</b>	22,312	1,850	11,537	288
<b>Karnataka</b>	21,549	1,839	9,244	339
<b>West Bengal</b>	21,231	743	14,166	736
<b>Rajasthan</b>	19,416	479	15,527	447
<b>Andhra Pradesh</b>	17,699	765	8,008	218



**Saturday's record number was once again powered by the five southern states, each of which is witnessing a growth that is faster than the national growth rate**

Tamil Nadu also reported more than 4,200 new cases, though it was Maharashtra once again that had the maximum number of cases. Maharashtra reported more than 7,000 new cases for the first time on Saturday, and its total confirmed cases crossed the 2-lakh mark.

The surge in Karnataka and Telangana, and also in Andhra Pradesh, along with consistent high numbers from Tamil Nadu has ensured that the contribution of the five southern states in the national caseload has gone beyond 25 per cent for the first time.

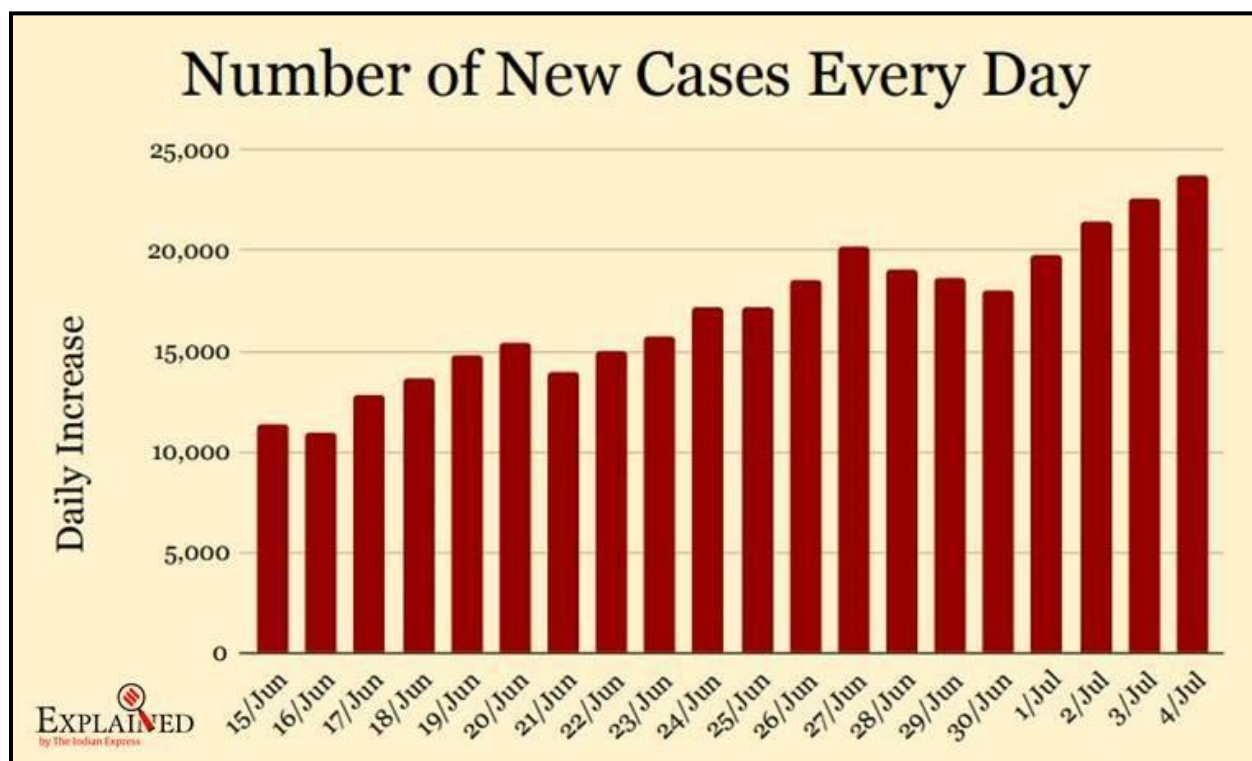
This number has been steadily increasing since the start of June, when it was about 17.5 per cent (see accompanying graph).

The rise has been more pronounced in the last three weeks as Telangana finally increased the number of samples it was testing.

The surge in Karnataka and Telangana happened almost simultaneously, and these two currently are the states with the highest growth rates. Telangana is growing (7-day compounded daily growth rate) at 7.51 per cent while Karnataka is growing at 8.82 per cent.

The current growth rate for India as a whole is only 3.47 per cent. Tamil Nadu, the state with the second-highest caseload in the country with more than one lakh confirmed cases,

has also been consistently contributing high numbers, more than 4,000 for the last one week, through its growth is more sedate, currently 4.56 per cent.



**As close to 25,000 new infections were added on Saturday, India's caseload reached 6.73 lakh, just a few hundred less than that of Russia**

The only exception to the southern surge has been Kerala, which has the lowest caseload and growth rate amongst the five states.

With just over 5,200 confirmed infections as of now, the state has less than one-third of the cases in Andhra Pradesh. The other three states have much higher caseloads. Kerala's current growth rate is 3.57 per cent, marginally higher than the national rate.

Kerala is also the only southern state not to be in the top ten list of states with maximum caseload. The other four are the only ones in the top ten that are growing faster than the national rate. Odisha has also begun to grow faster in the last two weeks.

The state has added almost 2,500 new cases in the last one week, and its current growth rate, 4.61 per cent, is significantly higher than the national rate. The state now has 9,070 confirmed infections out of which almost 6,000 have recovered, and 45 have died.



## **8.8 Maharashtra doubles Covid testing in July as it looks to cut record positivity, death rates**

**Source:** theprint.in, 29 July, 2020

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Maharashtra govt ramped up testing to nearly 20 lakh in less than a month by giving district officials targets and democratising the regime under a single department.



### **Medics walk past a swab testing cabin at Podar hospital in Worli**

Mumbai: Maharashtra added over two lakh Covid-19 positive cases to its cumulative tally in July, but it also significantly ramped up its testing this month, almost doubling the total number of tests conducted so far.

As of 28 July, Maharashtra conducted 19.72 lakh Covid tests, a 98 per cent rise from 1 July, when the total number of tests was at 9.95 lakh, according to data from the Maharashtra medical education and drugs department.

Maharashtra has so far recorded 3,83,723 Covid positive cases, of which 1,47,592 are active.

“Till the end of June, testing was lacklustre across the state. While our department was responsible for setting up the testing infrastructure, the responsibility for actual testing

was with another department,” a senior official from the state medical education and drugs department said.

“The state government then decided to bring both these aspects of testing under one umbrella, making our department solely responsible for the number of tests too,” said the official who didn’t wish to be named.

“Contact tracing was not rigorous. The testing per case was very low. Major centres such as Mumbai and Pune too were testing under 3,500 a day. We realised that the officials in charge were not ramping up testing fearing it will lead to a spike in numbers and they will be blamed for it,” the official said. “End of June, we started fixing these hiccups in testing.”

Currently, Maharashtra has a fatality rate of 3.62 per cent, higher than the country’s average of 2.25 per cent. It also has the country’s highest positivity rate at 20.04 per cent, higher than the national average of 11.59 per cent.

### **Democratising tests, setting targets**

The state government gave district officials certain targets to increase testing. For every positive case detected, officials were asked to test at least 10 individuals.

“Districts that were barely testing, such as those in the Vidarbha region, have now started testing at least 6-7 persons per positive case,” the medical education department official said.

“We also assured the local district health officers and urban civil surgeons that they will not be hanged for a surge in cases due to higher testing, which was one of their main concerns,” he said, adding at the same time collectors were told to plan quarantine and Covid care facilities better.

Meanwhile, the state also took steps to open up testing. In a circular on 23 June, it first allowed all hospitals, whether government, semi government, private or charitable, to conduct rapid antigen tests and antibody tests on any patient as required.

In another circular dated 6 July, the government permitted private establishments to conduct Covid testing for their employees, provided the minimum number of people being tested is 50. The state government also decided to do away with the requirement of doctors’ prescriptions for Covid testing, further democratising tests.

“The state government is helping district collectors procure rapid antigen tests, while civic corporations have been asked to procure their own test kits,” the official said.

### **Testing in Maharashtra close to peak capacity**

Places such as Mumbai, Pune, Thane, Aurangabad and Vidarbha districts such as Nagpur and Yavatmal have rapidly boosted testing over the past month.

The total tests in Mumbai increased by 45 per cent in July — from 3.33 lakh on 30 June to 4.85 lakh as of 27 July.

In the Pune district, 4.57 lakh persons had been tested for Covid as of 27 July, with about 1.16 lakh tests done in the past four weeks itself, an official from the district said.

District Collector Naval Kishore Ram tweeted Tuesday, “Testing, tracing and CFR (Case Fatality Rate). We are assessed on 3 main indicators. We have tested 457608 samples till date . More than 10 persons are being traced against one positive person.”

Similarly, Vidarbha districts, which initially had very few cases and low testing, have also started testing more since the past month. Testing in the Yavatmal district grew phenomenally to 13,407 as of 27 July, from just 4,950 on 1 July, according to the district’s records.

In the Nagpur district too, the number of tests increased to 66,176 as of 27 July from 24,206 as of 29 June.

State government records show Maharashtra has 133 viral diagnostic laboratories, with one RT-PCR test lab in almost every district, and the state’s peak testing capacity is 58,600.

The testing in Maharashtra is currently about 40,000, with the one-day testing on 27 July being 44,013.

“With improved testing, we are also hoping to reduce the mortality rate as more cases are detected right at the outset than on the fourth or fifth day as the case earlier was,” said another state government official.

## **8.9 India’s Covid tally in August highest in world so far**

**Source:** timesofindia.indiatimes.com,8 August,2020

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NEW DELHI: India is emerging as the biggest Covid-19 hotspot in the world in August. The country has so far recorded the most number of fresh cases this month, slightly more than the US and substantially higher than infections reported in Brazil. India has the world’s third highest death toll from the virus in the first six days of August.

The pandemic continued to surge on Friday, with fresh infections in the country crossing 60,000 for the second straight day and fatalities shooting up to 926, the highest single-day toll so far, as per data collated from state governments.

India reported 3,28,903 new coronavirus cases in the first six days of August. The corresponding figure in the US was 3,26,111 and in Brazil 2,51,264, according to worldometers.info.

India's daily cases have been the highest in the world on four of the six days of this month — August 2, 3, 5 and 6. India's caseload crossed the 2 million (20 lakh) mark on Thursday, with the fastest rise in cases from 1 million to 2 million among the three countries that have reached the grim milestone so far. India's infection growth rate of 3.1% was also higher than the US and Brazil at the 2 million stage.

In deaths, however, Brazil and the US have both registered more than 6,000 fatalities so far in August while India's count is 5,075.

On Friday, Maharashtra and Andhra Pradesh continued to register above 10,000 fresh infections. At least five states reported their highest single-day spike in cases — Bihar (3,646 new cases), Telangana (2,207), Odisha (1,833), Punjab (1,063) and Manipur (249).

For the third day in a row, Maharashtra added over 10,000 cases and reported over 300 Covid-19 deaths on Friday. The state added 10,483 new Covid-19 cases and reported 300 deaths, taking the total cases to 4,90,262, very close to the 5-lakh mark while the total fatalities were at 17,092, breaching the 17,000-mark. Mumbai's share in the state's daily addition was 8.2% on Friday as for the second consecutive day the city reported below 1,000 cases at 862. Friday's addition is the lowest in the last 10 days, underlining the city's "stable" Covid curve.

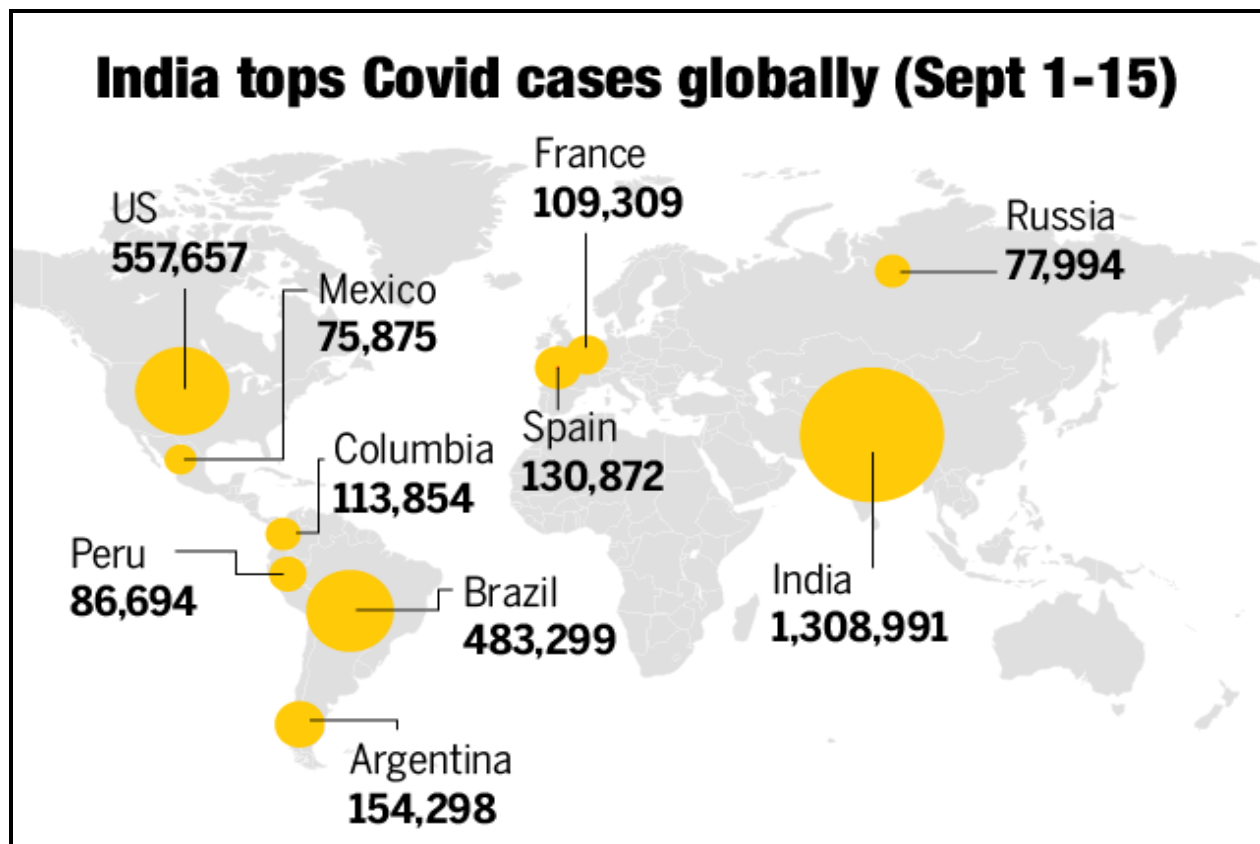
Andhra Pradesh on Friday reported the highest single-day toll of 89 deaths and 10,171 fresh Covid-19 cases, also becoming the third state in the country to soar past the two-lakh caseload. The cumulative tally of the state stood at 2,06,960 cases behind Maharashtra and Tamil Nadu, the two states having clocked the two-lakh coronavirus cases mark long ago. The state's death toll also jumped to 1,842.

Andhra Pradesh breached the one-lakh mark on July 27, nearly 135 days after the state reported its first case on March 12. But it took only 11 days for the state to add the next one lakh cases.

The number of fresh Covid-19 cases in Chennai fell below 1,000 for the first time in 52 days on Friday while Tamil Nadu recorded its highest toll with 119 deaths. Chennai had 984 of the 5,880 fresh cases in the state, which pushed up the case tally to 2,85,024. The cumulative death toll was 4,690. Active cases stood at 52,759.

## 8.10 September surge: India No.1 in Covid cases and deaths in first 15 days

Source: timesofindia.indiatimes.com, 16 September, 2020



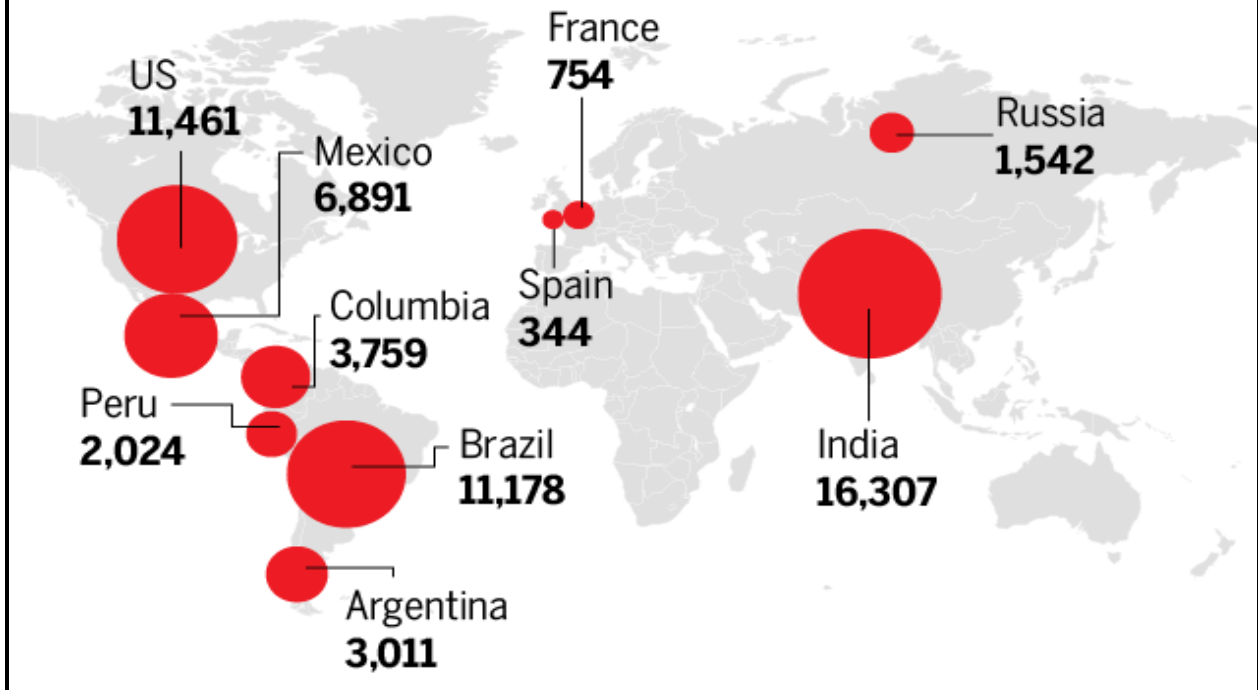
NEW DELHI: September is proving to be a grim month for India in its fight against coronavirus pandemic.

According to Johns Hopkins University data, the number of people who caught the infection in the first fortnight of the month was more than twice the number of new infections in US—the second worst hit country.

Such has been the surge in the daily rise of cases that India added 1 million Covid cases in a record time of 11 days in September.



## India had most Covid deaths in (Sept 1-15)



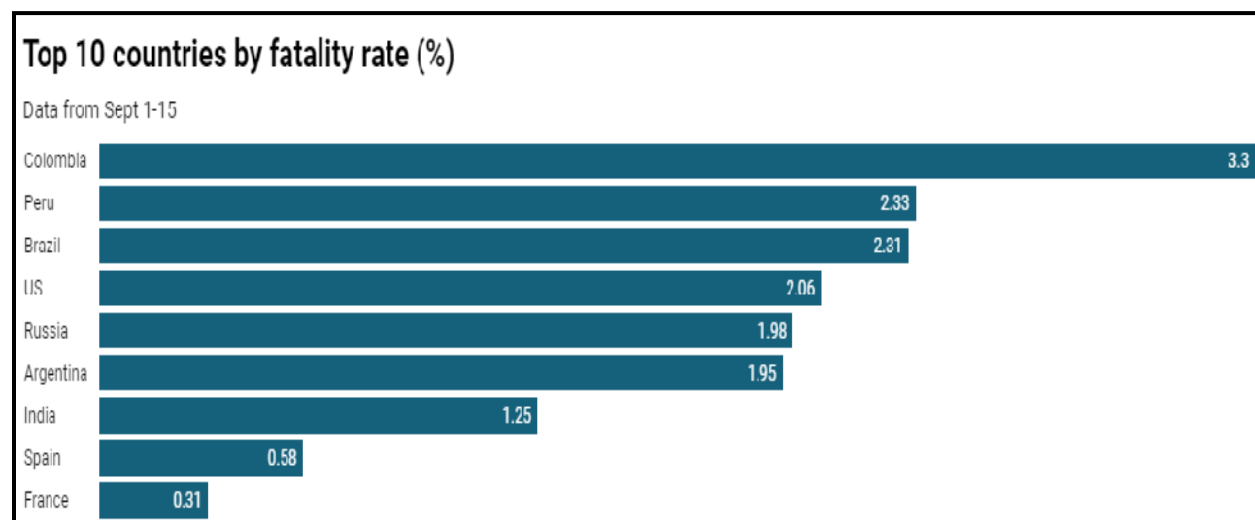
While India added 13,08,991 cases in the 15-day period, the United States registered 5,57,657 cases and Brazil which is third in this list recorded 4,83,299 cases.

India also tops the list of deaths that have happened due to the virus during this period. While India lost 16,307 lives in the 15-day period, the US and Brazil recorded 11,461 and 11,178 deaths respectively.

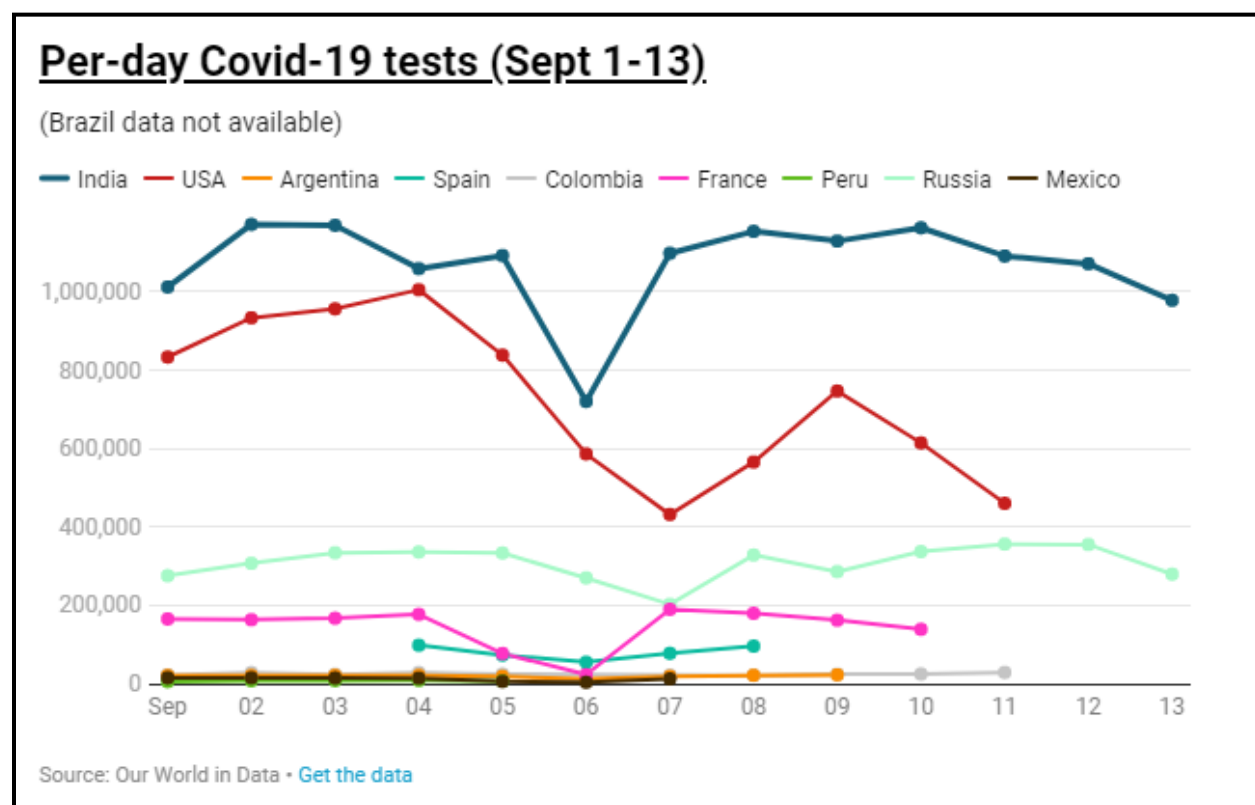
### India's daily count of cases in September

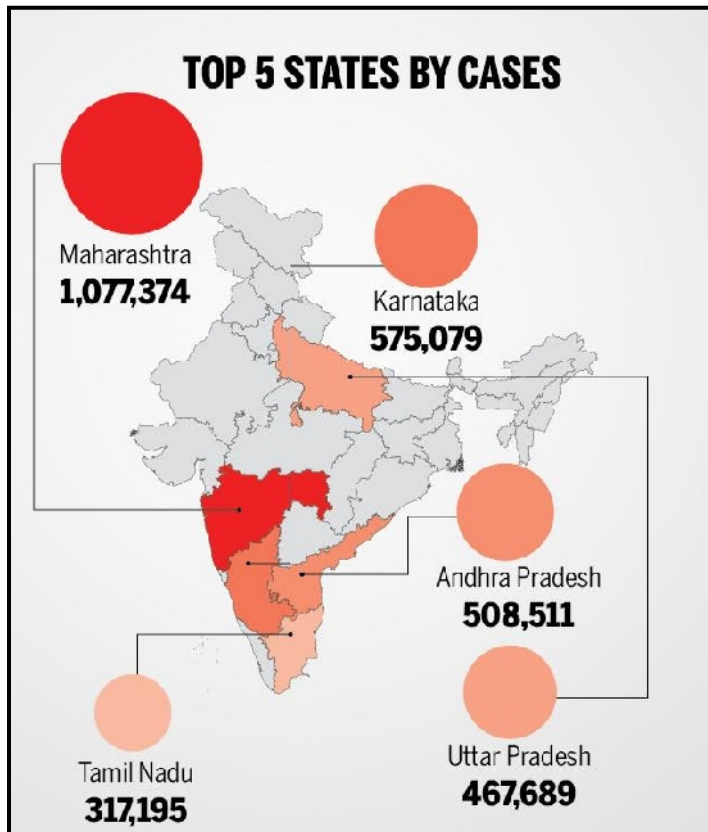


However, when it comes to the fatality rate during this 15-day period, India with a value of 1.25 stands at the 8th position. Mexico, Columbia and Peru occupy the top three positions in the list.



The increase in numbers is partly due to the progressive increase in the Covid-19 testing, which touched the 5.8 crore mark on September 15. India took 27 days to double its testing capacity from 1 crore to 2 crore, but took only 10 days to jump from 4 crore tests to 5 crore tests.





Five states - Maharashtra, Karnataka, Andhra Pradesh, Uttar Pradesh and Tamil Nadu - account for 60 per cent of the total active cases in the country.

While India's Covid numbers are indeed alarming, they could have been worse.

Union health minister Harsh Vardhan on Tuesday said the countrywide Covid-19 lockdown prevented approximately 14 lakh to 29 lakh cases and 37,000 to 78,000 deaths.

Elaborating on the lockdown advantage, Director General of the Indian Council of Medical Research (ICMR) Dr Balram Bhargava said that India has been able to 'distribute the

curve' as compared to other nations that saw a peak.

"We distributed the curve in such a way that we did not have those large number of deaths and that was attributable scientifically because of a very effective lockdown that was imposed in the months late March, April and May. So, we did not really have a huge peak from that perspective," he said.

Another statistics that may provide us some relief in these worrying times is that India's Covid-19 recovery rate has risen to 78.28 per cent. A total of 38,59,399 people have recuperated, exceeding the active cases of Coronavirus by 28,69,338 as on September 15, according to the Union health ministry.

## 8.11 COVID-19 India update for Monday, October 5

**Source:** timesnownews.com, 5 October,2020

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India crossed a landmark milestone as the active cases have been maintained below the 10 lakh mark for 14 days unabated. National recovery rate currently at 84.34%.

Mumbai: India's Covid-19 tally surges past 66-lakh mark with a spike of 74,442 new cases & 903 deaths reported in last 24 hours. The total case tally stands at 66,23,816 including 9,34,427 active cases.



The Deputy CEO of National Health Authority said that India stands out in terms of its COVID response. Our fatality rate is one of the lowest in the world. Our hospitals are capable to handle cases. For a developing country, the response is satisfactory & we're trying to live up to expectations.

Union Health Minister Dr Harsh Vardhan along with Uttar Pradesh CM Yogi Adityanath digitally inaugurated Super Speciality Block (SSB) at Motilal Nehru Medical College, Prayagraj. The 220-bedded facility has been dedicated as a COVID Hospital (DCH) to the nation. The Education Ministry said that schools must ensure a smooth transition of students from home-based schooling during COVID-19 lockdown to formal schooling. The ministry also announced that there will be no assessment till up to 2-3 weeks of schools' reopening and there should be flexibility in attendance norms. The ministry has asked States, UTs to prepare own SOPs for health, safety precautions for reopening of schools as per local requirements. Here's the latest on COVID-19 from your state:

Delhi reported 1,947 new COVID-19 cases, 3,588 recoveries/discharges/migrations and 32 deaths. Total number of cases rose to 2,92,560 including 2,63,938 recoveries/discharges/migrations and 5,542 deaths. Active cases stood at 23,080 according to the Delhi govt.

Maharashtra reported 10,244 new COVID-19 cases, 263 deaths and 12,982 discharges. Total cases in the state rose to 14,53,653, including 38,347 deaths and 11,62,585 discharges. Active cases stood at 2,52,277. Mumbai recorded 1,813 new COVID-19 cases and 47 deaths, taking the number of active cases to 24,199 and death toll to 9,152. 19 new COVID-19 cases reported in the Dharavi area of Mumbai, taking the total number of cases to 3,258 including 185 active cases and 2,781 discharges. Pune-Lonavala local train services to resume from October 12 for essential service providers.

Tamil Nadu reported 5,395 new COVID-19 cases, 5,572 recoveries & 62 deaths, taking total positive cases to 6,25,391, including 5,69,664 discharged cases, 9,846 deaths & 45,881 active cases.

Kerala recorded 5,042 new COVID-19 positive cases in the last 24 hours. Active cases in the state stood at 84,873. Bihar reported 907 new COVID-19 positive cases on October 4. Total count of active cases stood at 12,833.

Haryana reported 1,031 COVID-19 cases, 1,255 recoveries and 21 deaths taking total cases to 1,34,909 with 1,21,596 recoveries, 1,491 deaths and 11,822 active cases.

Rajasthan reported 2165 new COVID-19 cases & 14 deaths. The total number of positive cases rose to 1,46,195 including 21,215 active cases, and 1,559 deaths.

Gujarat reported 1,327 new COVID-19 cases & 13 deaths. Total cases in the state rose to 1,44,027, including 1,23,770 discharges and 3,512 deaths. The number of active cases in the state now at 16,745.

Jharkhand reported 816 new COVID19 cases, 1284 recoveries and 4 deaths, taking total cases to 88,026 including 76,843 recoveries, 747 deaths and 10,436 active cases.

Madhya Pradesh reported 29 deaths and 1,460 fresh COVID-19. The total number of positive cases in the state stood at 1,37,098 including 18,757 active cases, 1,15,878 recoveries and 2,046 deaths.

Karnataka reported 7,051 new COVID-19 cases, 7,064 discharges and 84 deaths, taking total cases to 6,47,712 including 5,22,846 discharges and 9,370 deaths. The number of active cases in the state stood at 1,15,477.



## 8.12 Pune's daily Covid tally remains under 1,000-mark for past one week

Source: hindustantimes.com, 12 October, 2020



**A healthcare worker at a Covid-19 testing centre in Pune, India, on Sunday, October 11, 2020**

This is for the first time after July, when cases have remained under the 1,000-mark throughout the week even as number of tests have been in the range of 4,000-4,600 barring Sunday, when it sees a drop due to it been the weekend.

Pune's tally of daily positive Covid-19 cases has been below the 1,000-mark for the past one week, bringing some respite to the civic administration battling the pandemic for the past seven months.

This is for the first time after July, when cases have remained under the 1,000-mark throughout the week even as number of tests have been in the range of 4,000-4,600 barring Sunday, when it sees a drop due to it been the weekend.

The city's positivity rate, which was 30.5% in the first week of September and 23.9% at the beginning of October has dropped to 20.39% during October 2 to October 11 (see box).

With the daily caseload falling at a time when the state government has increased the bed capacity in the city and rest of the district, the number of non-oxygen beds to remain vacant by October 15 are expected to be 13,020 while oxygen beds to remain unoccupied will be 763, according to the administration's projection.

The projection, prepared based on the statistical model by IIT Bombay and other experts, also indicates 243 ventilators and 1,185 ICU beds to be vacant by mid-October as the situation eases.

The drop in the number of daily cases and positivity rate is being observed even after the state government has allowed restaurants and bars to operate their dine-in facility since October 5. With shop timings also increased and most sectors, including hotel industry and travel allowed, there's increased crowd in the market, which has prompted the administration to ask the citizens to exercise caution.

Dr Subhash Salunkhe, chairman of the Communicable Diseases Prevention and Control Technical Committee, said, "It is too early to say that the infection is coming under control.

The government has only recently opened restaurants and bars and there are festivals planned in the future. It is true that the number of cases is falling daily, but we will know the exact situation only after Diwali."

Despite several attempts, the Pune Municipal Corporation additional commissioner Rubal Agarwal and Pune divisional commissioner Saurabh Rao were unavailable for comment on the bed projections.

"With most things open, many people are stepping out of their home. However, it has been seen that people are still not wearing masks," deputy chief minister Ajit Pawar had said during his Pune visit on Friday.

Chief minister Uddhav Thackeray too on Sunday asked people in the state to be careful and follow norms.

"While the cases have dropped in the past few days, people need to be careful," said Thackeray in his public addresses aired on social media.

Thackeray's caution came a day after Maharashtra health minister Rajesh Tope on Saturday indicated that by the end of November, remaining restrictions under the lockdown will also be lifted in the state and all sectors will be allowed to reopen.

Tope had said, that the government is now planning to give permission of reopening schools and religious places in the coming days.

### **8.13 Compared with September, October sees 70% drop in Covid-19 cases in PCMC areas**

**Source:** indianexpress.com ,2 November,2020

"Till Diwali is over, we cannot say the Covid-19 situation has been fully controlled. But it is true that the situation is improving day by day," said Municipal Commissioner Shravan Hardikar.



**According to the PCMC health department, in July, there were close to 22,000 positive cases in Pimpri-Chinchwad.**

Compare with September, October recorded a staggering 70 per cent drop in Covid-19 cases in Pimpri-Chinchwad. The civic administration, however, reiterated that it is too early to say the situation is fully under control.

"Till Diwali is over, we cannot say the Covid-19 situation has been fully controlled. But it is true that the situation is improving day by day," said Municipal Commissioner Shravan Hardikar.

According to the PCMC health department, in July, there were close to 22,000 positive cases in Pimpri-Chinchwad. In August, in a sharp rise, the number of positive cases recorded were 28,233 while the situation was similar in September when 28,518 were recorded. In

October, however, 9,026 cases were recorded. By the end of September, the total number of positive cases stood at 78,714, while by the end of October, total cases stood at 87,740.

" October has witnessed a big drop of around 70 per cent. Though the overall positivity rate remains 22 per cent, this month, the positivity rate is just around 8 per cent," Hardikar said.

In September, Pimpri-Chinchwad was reporting 1,000 to 1,300 positive cases daily. In October, between 100 and 300 cases were reported daily. On most days, fewer than 200 cases were reported, said Assistant Municipal Commissioner Anna Bodade.

The PCMC chief said the recovery rate had also improved significantly. "As of now, we have a recovery rate of 95 per cent. The mortality rate remains 1.7 per cent," he said, adding that the doubling rate stood at around 400 days. So far, Pimpri-Chinchwad has reported 1,511 deaths of Covid deaths.

Stating that the civic body had started raising awareness on avoiding the possibility of a second wave of infections, Hardikar said, "The possibility of cases rising during Diwali cannot be ruled out. And, therefore, we have launched an awareness drive to ensure that people maintain distancing and do not mingle under the guise of the festive period. Each person will have to take up the responsibility, only then will we be able to keep coronavirus at bay."

### **8.14 Coronavirus Highlights: India's COVID-19 Tally At 94.62 Lakh With 31,118 Cases In A Day**

**Source:** ndtv.com, 2 December,2020

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COVID-19 India Latest New Highlights: India, which reported its first case on January 30, is the second worst-hit country in the world by the pandemic after the United States.

#### **New Delhi:**

India recorded 31,118 new coronavirus cases, the lowest daily tally since November 17, data from the health ministry showed on Tuesday.

India now has 94.62 lakh COVID-19 infections, but the number of new daily cases has stayed below the 50,000 mark since November 7 despite a busy festival season last month. Deaths rose by 482, bringing the total to 137,621.

India, which reported its first case on January 30, is the second worst-hit country in the world by the pandemic after the United States.



### **Coronavirus Cases In India: Total active cases now stand at around 4.46 lakh**

Meanwhile, Union Health Minister Harsh Vardhan on Monday said that up to 30 crore Indians would be inoculated against COVID-19 by August 2021 according to the central government's plans.

However, he also reiterated the need to follow appropriate protocols to fight off the disease.

Distributing masks and soaps at the Old Delhi Railway Station today, the minister, who is also Chairman of the Indian Red Cross Society, said the vaccine will be available before the middle of next year in India.

"In the first 3-4 months of next year, there is a possibility we will be able to provide vaccine to the people of the country.

By July-August, we have a plan to provide vaccines to around 25-30 crore people and we are preparing accordingly," Mr Vardhan told reporters.



## **EXTREME WEATHER EVENTS – GLOBAL**

### **9. Heat Waves**

#### **9.1 Siberian heat wave of 2020 almost impossible without climate change**

**Source:** [worldweatherattribution.org](https://worldweatherattribution.org), 15 July, 2020

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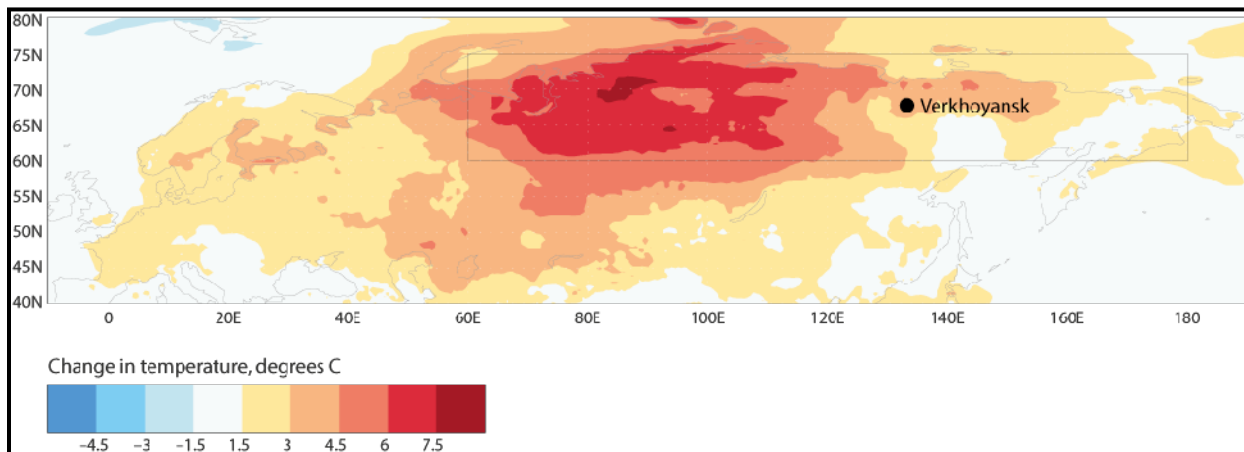
In the first six months of 2020, Siberia experienced a period of unusually high temperatures, including a record-breaking 38 degrees C in the town of Verkhoyansk on 20 June, causing wide-scale impacts including wildfires, loss of permafrost, and an invasion of pests. In our latest study, scientists from France, Germany, Netherlands, Russia, Switzerland and the UK collaborated to examine whether and to what extent human-induced climate change had a part to play in making this heatwave hotter and more likely. In many previous studies we have seen hot spells and heatwaves become hotter and more frequent around the world, consistent with our scientific understanding. In places such as Siberia, a hotter climate can have devastating effects, not just on the local wildlife and people who live there, but also on the world's climate system as a whole, for example through thawing permafrost, reduced snow cover and melting ice.

The current Siberian heat has contributed to raising the world's average temperature to the 2<sup>nd</sup> hottest on record for the period January to May. Using published scientific methods we looked at a large region spanning most of Siberia, inclusive of the area affected by the prolonged six-month heat and the town of Verkhoyansk that recorded the record daily temperature for the Arctic region. We analysed the average temperatures between January and June 2020 for the large region, as well as the hottest maximum daily temperature in June 2020 for Verkhoyansk. We found in both cases that this event would have effectively been impossible without human-induced climate change.

#### **Main findings**

- The results showed with high confidence that the January to June 2020 prolonged heat was made at least 600 times more likely as a result of human-induced climate change.
- We note that even with climate change, the prolonged heat was a very rare event expected to occur less than once every 130 years.

- The results for the town of Verkhoyansk show that the record breaking June temperatures were also made much more likely (upwards of many thousands of times), though there is less confidence in this result.
- Combining the values from the models and weather observations shows that for the large region the same six-months hot spell would have been at least 2 degrees Celsius cooler had it occurred in 1900 instead of 2020. For Verkhoyansk, maximum June temperatures increased due to climate change by at least 1 degree compared to 1900.
- By 2050 the Siberian region could expect to have temperatures increase by at least 2.5 degrees compared to 1900, but this increase could be as high as 7 degrees.
- This would correspond to an additional warming of at least 0.5 degrees and possibly up to around 5 degrees by 2050 compared to today.



**Prolonged Siberian heat: January – June 2020 average temperatures compared to normal (1981-2010) over the Siberian region used in the study, and the location of the town of Verkhoyansk that experienced the record June daily temperature within the Arctic circle**

## Background

Siberia can normally expect to have a series of low and high pressure systems moving over the region allowing warmer and cooler air to affect the weather. However, a strong jet stream in the 2019-2020 winter led to very warm conditions which caused ice and snow to melt and in turn increased the warming with darker surfaces absorbing more heat. Overall, the 6 months from January to June 2020 were more than 5 degrees Celsius warmer than average (1981–2010) over the study region (see Figure 1). This extremely hot period led to local heat records being broken, including at the Verkhoyansk weather station which recorded 38 degrees Celsius on 20 June. The Russian Meteorological Service said that this

measured temperature was the highest ever recorded beyond the Arctic circle, with the World Meteorological Organization carrying out its own research to verify this.

This has resulted in a range of natural and human disasters leading President Putin to declare a state of emergency, as reported in the media including The Guardian, Reuters and The New York Times. Siberian forests have been experiencing wildfires because of the hot, dry conditions that have extended across thousands of miles, and led to the release of 56 Megatons of CO<sub>2</sub> in June. Those areas not affected by the fires have become a breeding ground for large swarms of Siberian silk moths that feed on the trees making them more prone to fire. Fish are swimming deeper in the oceans looking for cooler water making it harder to catch them with current equipment, whilst people on the land have reported an increase in physical and mental conditions as a result of the increased and prolonged heat. The melting of the permafrost has caused infrastructure to collapse leading to fuel leakages and resulting environmental disasters. In addition, the melting could lead to the release of trapped methane gas, a potent greenhouse gas, into the atmosphere.

Heatwaves and hot spells can be defined in a large number of ways and there is not one “right” definition but depending on the impacts different definitions will be appropriate. For this study we used two definitions:

- The large region over Siberia which experienced prolonged higher than normal temperatures over the first 6 months of 2020, and
- The weather station in the town of Verkhoyansk that measured a maximum temperature of 38 degrees Celsius on 20 June.

For the large region we analysed average temperatures over 6 months while looking at maximum June temperatures for the single weather station. The large regional definition is relevant for most impacts whereas the temperature record at an individual place can help people understand their local changing climate.

From a scientific point of view it is always useful to compare different ways to define an event in order to assess how much the results depend on the exact definition. In this case we found for both extreme events (prolonged six-month heat and record daily temperature in June 2020 in Verkhoyansk) that human-induced climate change played a very large role. While we are very confident that the large-scale prolonged event would have been essentially impossible without climate change, our confidence for the daily record at the individual weather station is much lower.

This is due to better data being available and the increased robustness achieved from averaging climate models over large regions.

## 9.2 If you thought July was hot, you were right: It was one of Earth's hottest months ever recorded

Source: [usatoday.com](https://www.usatoday.com), 13 August, 2020

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Last month was a scorcher worldwide.

July 2020 tied with July 2016 as the second-hottest month ever recorded for the planet Earth, according to a report released Thursday by the National Oceanic and Atmospheric Administration.

Only July 2019 was hotter, and only by a fraction of a degree.

“The July 2020 global land and ocean surface temperature was 1.66 degrees above the 20<sup>th</sup>-century average of 60.4 degrees, tying with 2016 as the second-highest temperature in the 141-year record,” NOAA said. “Last month was only 0.02 of a degree F shy of tying the record-hot July of 2019.”

July 2020 also marked the 44<sup>th</sup>-consecutive July and the 427<sup>th</sup>-consecutive month with temperatures above the 20<sup>th</sup>-century average, according to NOAA.

Experts say this is a sure sign of human-caused climate change: “The trend of record heat continues – a trend which we’ve shown in past publications can only be explained by the warming impact of fossil fuel burning,” said Penn State University meteorologist Michael Mann.

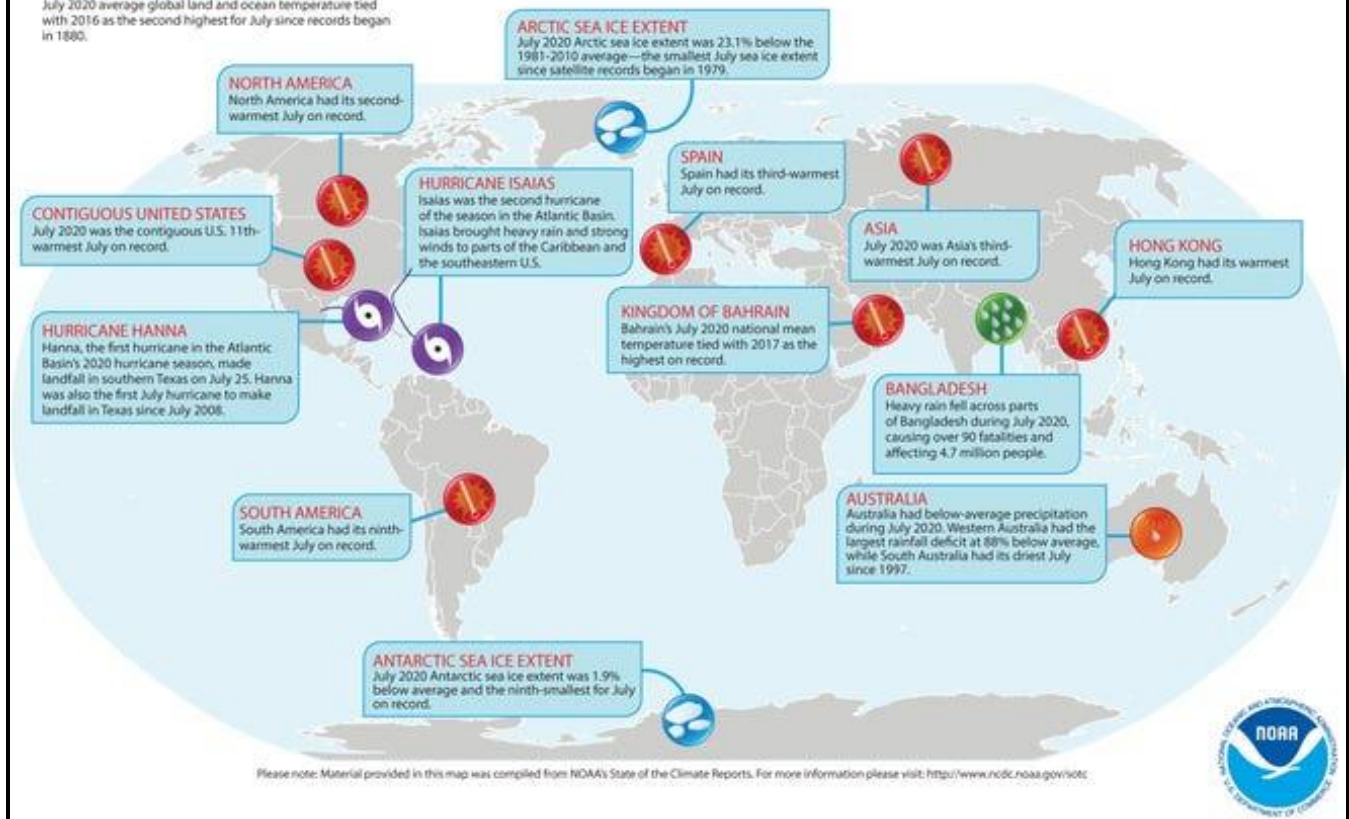
Record-hot July temperatures spread across parts of southeastern Asia, northern South America and North America. In the U.S., several states either set or tied their hottest month on record, including Virginia (tied), Maryland, Pennsylvania (tied), Delaware, New Jersey, Connecticut (tied) and New Hampshire.

What’s more, the Northern Hemisphere saw its hottest July ever – surpassing its previous record high set just last year, NOAA said.

## Selected Significant Climate Anomalies and Events: July 2020

### GLOBAL AVERAGE TEMPERATURE

July 2020 average global land and ocean temperature tied with 2016 as the second highest for July since records began in 1880.



“The unprecedented summer heat waves, droughts, wildfires and floods we continue to witness are all a consequence of the record warmth,” Mann said.

It was also very warm up north, as Arctic sea ice extent for July 2020 was the smallest-July extent in the 42-year record at 846,000 square miles (23.1%) below the 1981–2010 average, according to an analysis by the National Snow and Ice Data Center.

In addition, July continued the pattern of unusually warm months this year. For the year-to-date, 2020 is now the second-warmest year on record, trailing only 2016.

“The year-to-date global land and ocean surface temperature was the second-highest in the 141-year record at 1.89 degrees above the 20<sup>th</sup>-century average of 56.9 degrees,” the report said. “This value is only 0.07 degree less than the record set in 2016.”

It's the hottest year on record across a large portion of northern Asia, parts of Europe, China, Mexico, northern South America as well as the Atlantic, northern Indian and Pacific Oceans.



### 9.3 Three out of the past five Julys were the hottest on record

**Source:** weforum.org,14 August,2020

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- July temperatures in 2016, 2019 and 2020 were the hottest ever.
- The last fully intact ice shelf in Canadian Arctic collapsed in July's heatwave.
- Climate change could double the area of central Europe affected by severe drought by the second half of the century.

The July just gone was the third-hottest ever recorded, according to the Copernicus Climate Change Service. This isn't the result of a one-off heatwave or freak weather front, but part of an alarming trend that has seen three of the hottest July months ever recorded – peaking in 2016, followed by 2019 – occurring within the past five years.

June 2020 saw the joint-hottest average temperatures for this month, together with 2019. Both Junes had average global temperatures 0.5C above the 1981-2010 average.

For more temperate parts of the world, hotter summers are concerning. But what happens when summers get hotter in already very hot places?

#### **Too hot to survive without air conditioning**

This summer, Iraq's capital Baghdad has endured some of the hottest days ever, with temperatures in excess of 50C, during a heatwave that has hit much of the Middle East. While the region is used to hot weather, countries including Israel and Lebanon have experienced unusual heat extremes, a sign of things to come as climate change continues to heat up the planet.

Humans could face a future that's too hot to survive without air conditioning. Exposure to extreme heat can stress the body to the point where organs shut down, presenting potentially life threatening conditions for many people living in developing countries.

But hot weather is only part of the climate crisis story.

Warming temperatures make extreme weather events, such as floods, storms and droughts, both more likely and potentially more intense. Warming temperatures could make extreme droughts as much as seven times more likely, according to new research.

This means the area of cropland affected by extreme drought across central Europe could double in the second half of this century, to more than 40 million hectares (approximately 400,000 square 100ocused100ze), the Guardian reported.



### **A July heatwave brought record-breaking temperatures to Baghdad**

Using precipitation and temperature data from records from as far back as 1766 to inform climate change computer models, researchers from the UFZ-Helmholtz Centre for Environmental Research in the German city of Leipzig forecast that moderate reductions in greenhouse gas emissions could reduce the drought-affected area of central Europe by 40%.

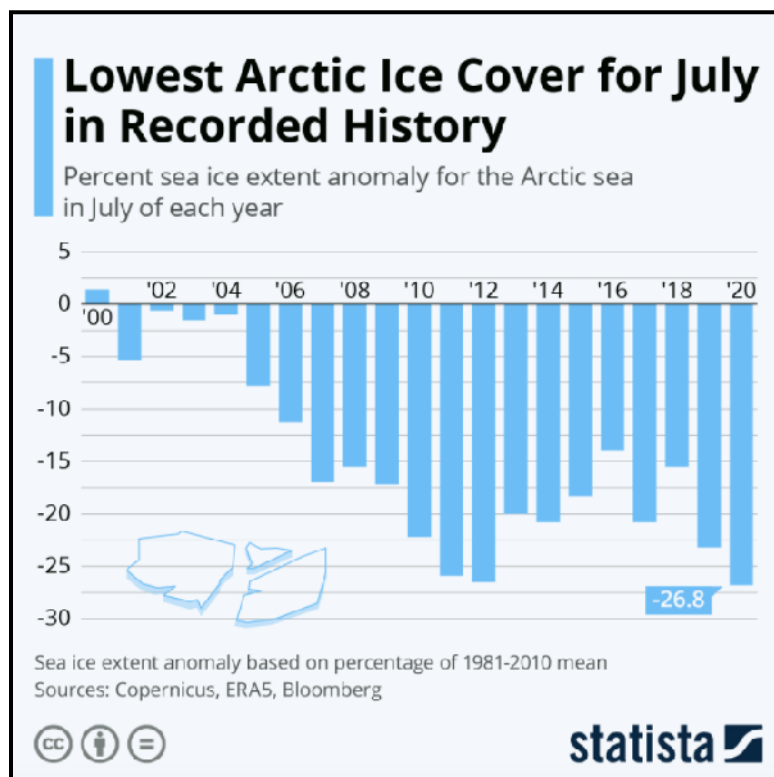
### **Sinking islands**

In the icy wilds of remote northern Canada, the threat of droughts isn't a consideration, but the region is no less affected by climate change.

At the periphery of Ellesmere Island sits the Milne Ice Shelf, the last fully intact ice shelf in the Canadian Arctic. July's extreme heat caused two-fifths of this natural wonder to break up in just two days.



## Intense summer heat is causing ancient ice shelves to collapse



### Lowest arctic ice cover for July in recorded history

lowest recorded ice cover for the month of July since records began in 1981.

While the impact of global warming is clear to see, it's not tackle the climate crisis, but urgent action is needed to accelerate the journey toward net zero emissions.

"This was the largest remaining intact ice shelf, and it's disintegrated, basically," Luke Copland, glaciologist at Canada's University of Ottawa, told Reuters, explaining that summer temperatures in the Canadian Arctic this year climbed 5C above the 30-year average. "You feel like you're on a sinking island chasing these features, and these are large features. It's not as if it's a little tiny patch of ice you find in your garden."

Extreme July temperatures have hit the entire Arctic region, which scientists say is warming more than twice as fast as the rest of the planet. The 2020 summer melt produced the

## 9.4 Heatwaves are becoming more deadly as nights warm faster than days

Source: cnbc.com,12 September,2020



**A photographer takes a picture of the thermometer reading 132 degrees Fahrenheit (55.5 Celsius) at the Furnace Creek Visitors Station in Death Valley National Park, California, August 17, 2020**

The U.S. this summer has experienced stifling hot temperatures that have set all-time records and put millions of people under excessive heat warnings.

During a historic heatwave in the Western U.S., temperatures in Death Valley, California reached 130 degrees Fahrenheit, a potential record for the highest temperature ever reliably recorded on Earth. Oakland, California reached 100 degrees for the first time ever in August and Phoenix had its highest temperature for the month at 117 degrees. And on Sunday, temperatures in one part of Los Angeles hit 121 degrees as the state deals with ongoing wildfires.

The stifling heat is becoming more dangerous with climate change. One reason is because global heating is not occurring evenly: Lower nighttime temperatures that typically provide critical relief from the hot days are disappearing.



Summer night temperatures are warmer now, and they are warming at a faster rate than daytime temperatures, according to the National Oceanic and Atmospheric Administration. This marks a dangerous and potentially deadly combination of high daytime and high nighttime temperatures that doesn't give the human body a chance to cool down during the night.

"Warm nights mean less chance to cool down, exacerbating exposures to high temperatures, particularly for vulnerable people and locations," said Kristie Ebi, a professor of global health at the University of Washington.

In the U.S., heat kills more people than any other weather disaster, from floods to hurricanes.

"Climate change is leading to a dramatic increase in the intensity of heat extremes, and the consequences on human health are already being seen in countries around the world," said Ben Zaitchik, an associate professor at Johns Hopkins University. "If the body can't cool down at night then the health impacts of a hot period can be particularly severe."



**Firefighter Sara Sweeney uses a drip torch to set a backfire to protect mountain communities from the Bobcat Fire in the Angeles National Forest on September 10, 2020 north of Monrovia, California**

Climate change is making heatwaves and droughts more common, intense and widespread. Dry and hot conditions exacerbate wildfires, which have grown more destructive in recent



years. Dozens of major fires are currently burning through the U.S. West Coast, destroying hundreds of homes and wiping out entire neighborhoods in Oregon.

Climate change is also causing more humid heatwaves. Hot and saturated air doesn't allow sweat to evaporate as quickly and causes the body to heat up even more, which can be deadly.

"The trend in California that we have seen since the heat wave in 2006 is heat waves are also more humid, and Californians are generally not acclimated to high levels of humidity and high temperatures — it's this combo that is most deadly," said Rupa Basu, chief of air and climate epidemiology for the California Office of Environmental Health Hazard Assessment.

"Because of power shortages with blackouts, we can not rely only on [air conditioning] as a method to cool down," Basu added.

Daily low temperatures for many parts of the world have been increasing more quickly over the past decades than daily high temperatures, according to Randall Cervený, a researcher at Arizona State University who studies temperature records for the World Meteorological Organization.

Phoenix this summer hit an alarming record when it had 28 nights where temperatures never dropped below 90 degrees, surpassing the old record of 15 days in 2013 and 2003, according to Cervený. The city also experienced two separate week-long streaks of nights not falling below 90 degrees.

The temperature extremes are a result of global climate change as well as a so-called urban heat island, which occurs when heat from the daytime is taken in by heat-absorbing asphalt or concrete, driving hotter nights and early mornings.

"The extent of adverse illnesses and deaths will depend on proactive actions to raise awareness of the health risks of heat, to redesign cities to reduce urban heat islands and to reduce our greenhouse gas emissions," Ebi said.

Poor and minority populations who are more likely to live in neighborhoods without tree cover are disproportionately impacted by extreme heat. Black and Latino people in the U.S. are more likely to reside in hotter areas with more industrial activity and highways.

Hotter nighttime temperatures also leave people who can't afford air conditioning in their homes at elevated risk of heat-related illness. And by sending hot air outside of homes, air conditioners can exacerbate the urban heat island. "During the day, one might seek relief by moving to cooler environments, but at night if you can't air condition your home to a

comfortable temperature then you are at the mercy of the background temperature,” Zaitchik said.

Across the world, every decade over the last 60 years has been hotter than the last. It’s virtually certain that 2020 will be among the top hottest years in recorded history.

## **10. Heavy Precipitation Causing Floods and Landslides**

### **10.1 Climate crisis blamed for rains and floods that have killed 150 in Brazil**

**Source:** theguardian.com,13 March,2020

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#### **Residents and a firefighter dig for victims of a mudslide in Guarujá in Sao Paulo state in Brazil on 4 March**

About 150 people have been killed or are missing following record-breaking heavy rains, landslides and flooding in three Brazilian states this year.

Scientists say global heating is contributing to more “extreme rainfall” events in the country, and warned that such disasters could become “the new normal”.

Monsoon rains kill Brazilians every summer, with floodwaters filling streets and landslides afflicting poorer communities and favelas built on steep hillsides, often without proper drainage or sanitation.

But global temperatures have climbed steeply since the 1980s, and a warming atmosphere causes more evaporation, making more water available for precipitation.

Official data sent to the Guardian showed “extreme rainfall events” – when more than 80mm or 100mm falls within 24 hours – have soared over the past 30 years in the capitals of the south-eastern states of São Paulo, Rio de Janeiro and Belo Horizonte, where the deadly rains happened.

Scientists blame a combination of growing cities and climate breakdown.

“We are seeing more and more extreme events happening in big and important cities,” said Tercio Ambrizzi, a professor of climatology at the University of São Paulo. “There is a relationship with the increase in average global temperatures.”

In Guarujá, a coastal town 25 miles from São Paulo, 282mm fell in just 12 hours last week – more than the total expected for the entire month of March.

“I never saw a day it rained like that,” said Rafael Soares, 22, a tyre factory worker from the town’s hillside Barreira do João Guarda community, hit by a landslide on 3 March that buried dozens of houses, killing 18 people and leaving dozens still missing.

Soares heard a deafening boom at about 1am and ran up the hill behind his house to find that part of his community had been buried.

“You couldn’t see anything, just earth and mud,” he said, describing “just hearing cries, people crying, not knowing what to do. There was no light, there was nothing.”

He spent days with neighbours and rescue workers digging survivors and the dead out of the earth and was housed with hundreds of other residents in a local school before being allowed to go home.

Days earlier, five people died during heavy rains across Rio de Janeiro. One man drowned when the Acari favela in north Rio was flooded. Bruna Aguiar, an activist from the favela’s Fala Akari collective, said rains have worsened there since a flood in 2013.

“Older people talk about other floods in the 1970s, but nothing of this magnitude,” she said.

According to data from Brazil’s National Institute of Meteorology (Inmet), one Rio de Janeiro weather station logged 134 extreme rainfalls from 1960 to 1990, and 221 from 1990 to 2020. A São Paulo weather station reported 15 from 1960 to 1990 and 44 since.

“There’s clearly been an increase of extreme events in the south-east of Brazil,” Ambrizzi said.

His own research from São Paulo – capital of the state where four people died in two days in February following heavy rainfall – backs this up.

Data from two weather stations in the city showed an increase in extreme rain events, according to a paper Ambrizzi and other scientists published in Annals of the New York Academy of Sciences last month. The dry season has begun extending from September into October in recent decades, they found.

“This, together with the inappropriate occupation of risky areas, such as slopes and banks of water-courses, leads to inundation, flooding and landslides,” the paper said. “Changes in extremes can be partly due to natural climate variability but can also be related to global warming and/or focused.”

“Urban heat islands” created by the concrete and lack of vegetation in big cities increase temperatures, scientists said, and lack of permeable ground means more flooding. Global warming exacerbates the effect.

“When it is hotter, it rains more, and this gets worse if you have urban areas, areas of concrete and asphalt,” said José Marengo from Brazil’s National Centre for Monitoring and Alerts of Natural Disasters, and another of the paper’s authors.

Not all scientists hold global warming responsible. Brazil’s Space Research Institute said the rains were “meteorological phenomena typical of summer”, and blamed them on the South Atlantic convergence zone – “a band of clouds that channels moisture from the Amazon and the tropical Atlantic Ocean” for three days or more, producing heavy rain and cold fronts. Nor has the rain increased everywhere: the north-east has seen more extreme droughts, it said.

“You can’t focus everything and blame global warming for everything,” said Josélia Pegorim, a meteorologist from the Climatempo weather service, while noting summer’s rains have been exceptional. “We are breaking records,” she said.

In January, 59 people were killed during heavy rains in Minas Gerais state. According to Inmet data, its capital Belo Horizonte saw 30 “extreme rain” events from 1960 to 1990, and 52 from 1990 to 2020.

In Belo Horizonte, 13 people were killed in January, when 935mm of rain was recorded at one weather station – the highest level since 1910, and more than half the rainfall expected for the whole year. Extreme rain events and consecutive droughts are likely to continue,

said Carlos Nobre, one of Brazil's leading climate scientists and a senior researcher at the University of São Paulo's Institute for Advanced Studies. "This is the new normal," he said.

## **10.2 Heavy rains and flooding hit large parts of Asia**

**Source:** public.wmo.int,10 July,2020

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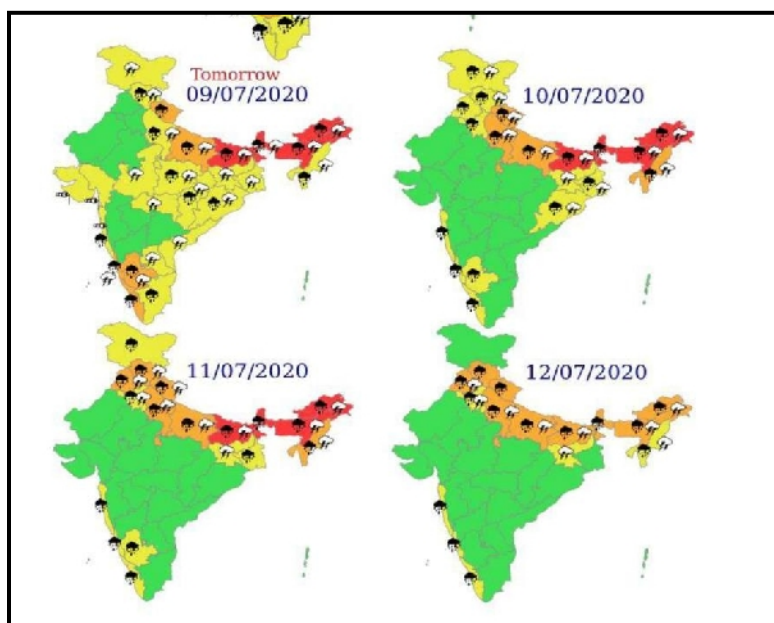
Unusually heavy monsoon rainfall and flooding is affecting India and neighbouring South Asian countries, as well as China and Japan. This has caused major disruption, displacement and loss of life, and once again highlighted the importance of national meteorological and hydrological services in protecting public safety.

The situation is expected to be aggravated by further rain. More than 200mm of rainfall could fall in 24 hours in some mountainous regions of Bhutan/Bangladesh, Northeast India, Myanmar and Nepal according to the South East Asia Flash Flood Forecast System. Additional similar amounts could be possible for the next 4-5 days. Authorities in China are also warning of more rains.

"Challenges posed by the devastating rains and floods in Asia are being complicated by COVID-19. Even though global attention is understandably focused on the pandemic, this should not distract us from the continuing need for investment in multi-hazard early warning systems to boost resilience, said WMO Secretary-General Petteri Taalas.



“This is especially true given that climate change is increasing the risk of extreme rainfall events, flooding and coastal inundation,” he said. “WMO and National Meteorological and Hydrological Services will continue to work to protect lives and livelihoods.”



The India Meteorological Department has issued top-level red warnings for heavy rainfall for many north and northeastern Indian subdivisions for the next 4 days, mainly Assam & Meghalaya, Arunachal Pradesh, Bihar, and East and West Uttar Pradesh, valid through 12 May.

A number of flood warnings have been issued by the Flood Forecast Center in Bangladesh, where many northern parts of

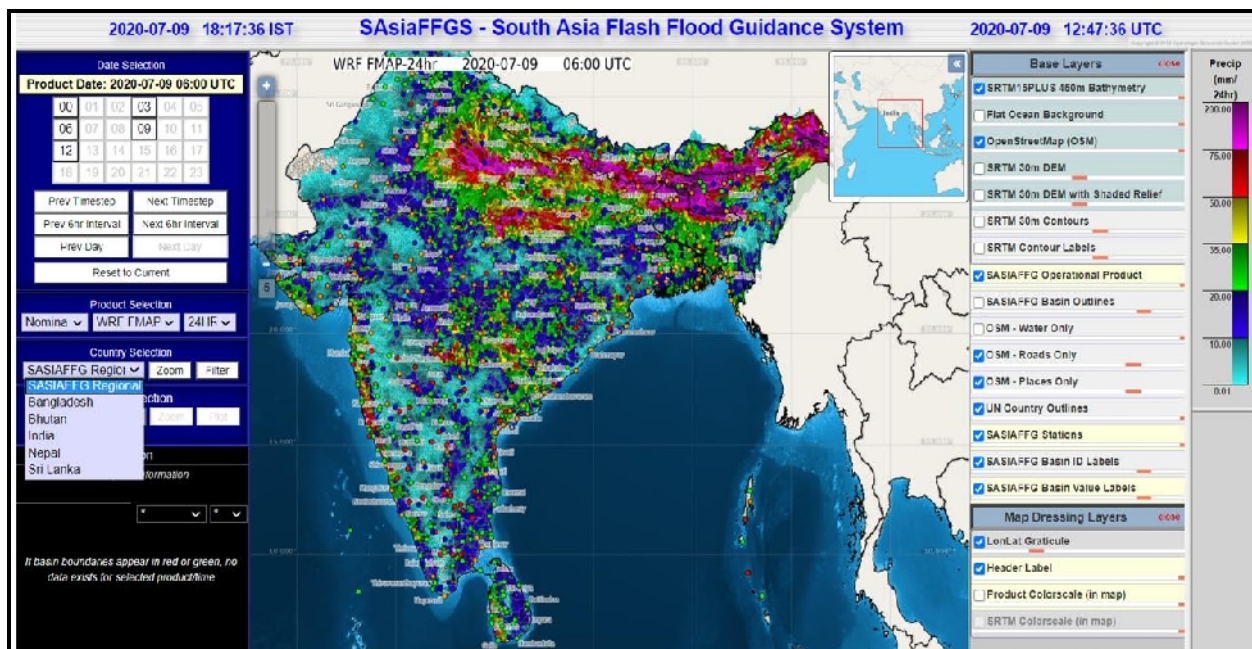
the countries were submerged in late June. The Bhutan National Centre for Hydrology and Meteorology and the Hydrology and Meteorology department in Nepal are also issuing advisories for heavy rainfall, the potential for flash floods and landslides and the risk of rivers breaking embankments.

The South Asian monsoon is the backbone of the regional economy. But in addition to its benefits, it causes loss of life and disruption every year.

Many areas in central and north/northeast India have seen more than 150mm above average monsoon rains so far this year. Tens of thousands of people have been forced out of their homes in the Assam region of India, and there has been coastal flooding in the state of Gujarat.

### **Flash Flood Guidance System**

The warnings of heavy rainfall and flooding in South Asia coincide with an online Flash Flood Guidance System training session from 8-10 July. It was led by the India Meteorological Department, which is the Regional Center of the South Asia Flash Flood Guidance System, and involved more than 100 operational forecasters from 40 IMD sub-offices and from Bhutan, Bangladesh, Nepal and Sri Lanka.



The training program promotes the implementation of the FFGS through regional and national Centers in South Asia, which is prone to natural hazards like flash floods, riverine floods and tropical cyclones. Participants conducted hands-on exercises, discussed regional operations and case studies including India, Bangladesh, Bhutan, Nepal, Sri Lanka.

FFGS was developed to improve the capacity of NMHSs to issue flash flood warnings and alerts about a major natural hazard. As of the beginning of 2020, it provides early warnings to three billion people – 40% of the world’s population – across more than 60 countries.

The global initiative brings together WMO, U.S. National Oceanic and Atmospheric Administration (NOAA), the Hydrologic Research Center (HRC) and U.S. Agency for International Development/Bureau For Humanitarian Assistance (USAID/BHA). “Thousands of people die in riverine and flash floods. Many of them could be saved by improved early warnings, information about the risks of these sudden-onset events and better water resource management,” Hwirin Kim, Head of WMO Hydrological and Water Resources Services Division, told the training session.

## China

Severe flooding has affected millions of people, with dozens of casualties. Since June, continuous downpours have lashed large parts of southern China, and the waters of many rivers – including the mighty Yangtze river – in the affected regions have exceeded warning levels. Dozens of lives have been lost and there has been major disruption.

China’s State Flood Control and Drought Relief Headquarters upgraded the emergency response for flood control from level IV to level III on 7 July, as incessant downpours

continued to wreak havoc across vast stretches of the country. China has a four-tier flood control emergency response system, with level I representing the most severe. The China Meteorological Administration says that until 11 July, rainstorms will still reign over Southwest China, South of the Yangtze River Region, Jiangnan Region, and Jianghuai Region, and then move northwards. Heavy downpour will lash northern Jiangxi, northeastern Hunan, and central and northern Sichuan Basin. There will be severe convective weather like short-range heavy rainfall. The hourly intensity will reach 30-50mm.

## **Japan**

For more than a week flooding has affected southern parts of Japan, with dozens of reported fatalities and missing people. At least 270,000 people were told to evacuate in four prefectures across Kyushu Island. The Japan Meteorological Agency continues to issue many warnings and advisories for heavy rain, thunderstorms and ground loosening rain. It has also set up a dedicated multi-lingual portal on the heavy rainfall event.

## **10.3 Nepal Rain, Landslides Kill 60 People, 41 Are Missing**

**Source:** [ndtv.com](http://ndtv.com), 13 July, 2020



**60 dead, 41 missing in Nepal landslides and heavy rain**

Nepal monsoon news: Landslides and floods are common in the Himalayan country during the monsoon season. As of Sunday, about one thousand people have been displaced.

Kathmandu: Four days of continuous heavy rain and landslides have killed 60 people in Nepal. 41 people are missing, say authorities. Myagdi district in western Nepal is the worst affected with 27 deaths. Rescue operations are under way.

“Two of our wards have been completely swept away due to landslides,” news agency ANI quoted the local body representative as saying. Hundreds have been displaced as landslides buried their homes. Local school buildings and community centres have been turned into shelters for the flood-affected people.

“In the first phase we rescued the injured people and that took us around 30-35 hours to complete. Now, we are continuing our search operation for the missing who are believed to be buried under the debris. Identification of the dead and arrangements for their cremation are being done,” Thamsara Pun, village head of Dhaulagiri in Myagdi said.

Landslides and floods are common in the Himalayan country during the monsoon season. As of Sunday, about one thousand people have been displaced. Landslides have also blocked roads and mudslides are hampering rescue operations, say local news reports.

Last week, at least 12 people were killed in landslides and 19 others missing, the country’s police said on Friday. Three children are among those who died in landslides.

Narayani and other major rivers in Nepal are swollen due to the continuous downpour in the last few days.

Earlier, the meteorological office of Nepal had predicted heavy rain over the weekend across the country. In its latest bulletin, country’s weather office said, a low-pressure belt in the Terai region is causing continuous rainfall.

## **10.4 South Korea floods, landslides kill 21 as heavy rains continue**

**Source:** timesofindia.indiatimes.com,8 August,2020

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SEOUL: At least 21 people have died after 46 days of heavy rains in South Korea, with the country’s longest monsoon in seven years causing more flooding, landslides and evacuations on Saturday.

More than 3,000 people had been evacuated as of 6 a.m. local time on Saturday (2100 GMT Friday), according to Ministry of the Interior and Safety data, as rains battered the southern part of the Korean peninsula. Eleven people are missing.



About 100 metres (109.36 yards) of levee collapsed at the Seomjin River in the southern edge of the peninsula on Saturday and flooded the area, an official at the South Jeolla province said, with about 1,900 people evacuated in the province including about 500 from around the river.

The country's forestry agency has raised landslide warnings to its highest level in every region except the holiday island of Jeju.

Five homes were buried in a landslide on Friday from a mountain behind a village in Gokseong, South Jeolla province, killing five people. Three people have been rescued.

In neighbouring North Korea, state media KCNA reported that Premier Pak Pong Ju, the country's third-highest ranking official, inspected flood damage to submerged fields and crops in southwest regions of the country.

## **10.5 Landslide in Vietnam Kills at Least 20 Military Personnel**

**Source:** nytimes.com, 19 October, 2020



**A photo released by Vietnam's state news media showed military personnel carrying a body recovered from the site of a landslide in Quang Tri Province on Sunday**

A landslide in Vietnam on Sunday killed at least 20 military personnel and left two missing, the local news media reported, following weeks of torrential rains and flooding that have devastated parts of the country and killed dozens of people.

The mudslide began in the early hours of Sunday morning and leveled the soldiers' barracks in Huong Phung Commune, in the central coastal province of Quang Tri.

"There have been four to five landslides, exploding like bombs, and it feels like the whole mountain is about to collapse," Ha Ngoc Duong, the vice chairman of the commune, told VnExpress, an online state-run news outlet.



Mr. Duong added that the mudslides were likely to continue, hindering search-and-rescue efforts.

The deaths could be the country's largest military loss in peacetime, officials said, and came just days after another landslide killed 13 people, most of whom were also members of the military, in neighboring Thua Thien Hue.

"We've never lost so many military members, including two generals and high-ranking officials, in natural disasters," the government said in a statement.

Pham Tan An, a survivor of the Sunday mudslide, told VnExpress he felt "completely powerless" after seeing his colleagues buried beneath the rubble.

"For us who were lucky enough to survive, it's really heartbreaking to know our 22 teammates didn't make it. Now, when closing my eyes, all I can think of is us enjoying a meal together," he told the news outlet.

Rapid development and deforestation have exacerbated the damage caused by seasonal flooding. Floods in 2018 killed more than 20 people and destroyed hundreds of homes.

"Vietnam has the perfect storm," Adam Switzer, a sedimentologist at the Earth Observatory of Singapore, said of Vietnam's susceptibility to flooding and landslides. "It has seas, rainfall, it has very heavily vegetated steep slopes, and it has seismic activity."

Extreme downpours have pummeled Vietnam since early October, causing some of the worst flooding in years. More severe rain is expected this week.

In Quang Tri Province alone, close to 50 people are dead or missing. More than 12,000 residents have been evacuated because of the floods, which have inundated nearly 45,000 homes, the state news media reported.

Seventy schools have also been submerged beneath the floodwaters in areas along the Thach Han River in Quang Tri, according to the government newspaper VGP News.

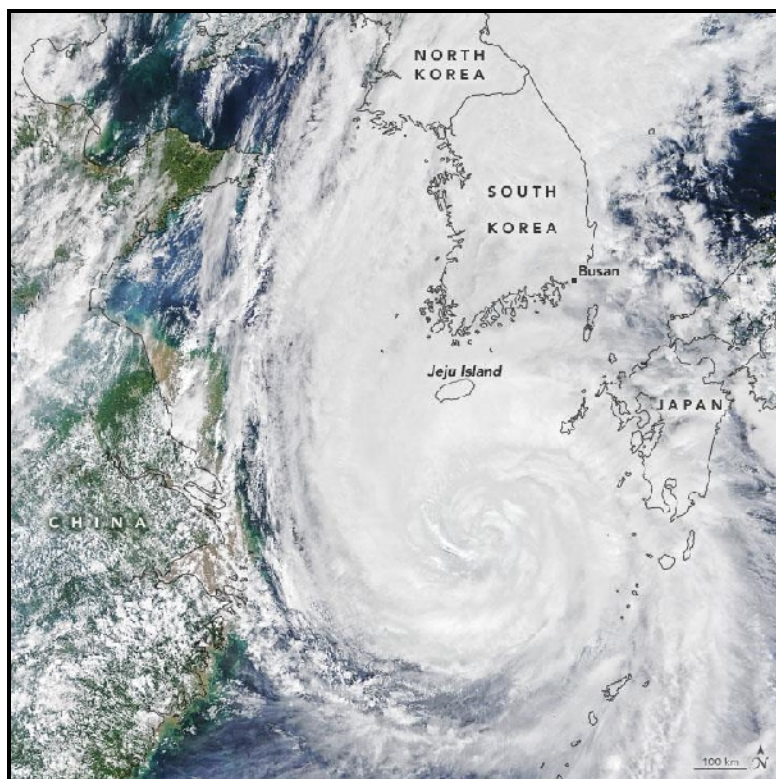
So far, the floods have cost Vietnam around \$520,000, Vo Van Hung, the chairman of the Quang Tri People's Committee, told the paper.

"We need to understand why this happened," said Mr. Switzer, the sedimentologist, who warned that effects of climate change could cause similarly devastating floods in the future, "so that when the next landslide happens, we are better prepared."

## 11. Cyclones

### 11.1 Typhoon Maysak Batters South Korea

**Source:** earthobservatory.nasa.gov, 3 September, 2020



A peninsula that typically sees one typhoon per year might face three landfalling storms in two weeks. One week after Typhoon Bavi brought fierce winds and rain to North and South Korea, Typhoon Maysak plowed into South Korea as a category 2 storm.

The Moderate Resolution Imaging Spectroradiometer (MODIS) on NASA's Terra satellite acquired this natural-color image of Maysak in the late morning on September 2, 2020. At the time, the storm had sustained winds of roughly 190 kilometers (120 miles) per hour.

#### September 2, 2020

Shortly before landfall, in the early hours of September 3, the U.S. Joint Typhoon Warning Center reported sustained winds of 170 kilometers (105 miles) per hour as the eye of the storm was southwest of Busan, South Korea's second-largest city and the world's fifth-largest port. It is believed to be just the sixth typhoon of category 2 strength or higher to hit the Korean Peninsula since 1951. Maysak reached typhoon strength on August 29 and intensified to become the strongest typhoon so far in the 2020 Western Pacific season. At peak intensity on September 1, Maysak's winds measured 230 kilometers (145 miles) per hour, a category 4 storm. The typhoon battered Okinawa, the Ryukyu Islands, and Jeju Island before moving ashore on the Korean Peninsula. Forecasters called for widespread rainfall of 100 to 200 millimeters (4 to 8 inches). That rain will fall upon ground that has been soaked by South Korea's second-wettest monsoon season on record and by rains from Typhoon Bavi. The storm troubles may not be over for North and South Korea. Another

typhoon, Haishen, has been developing south of Japan, and several potential storm tracks have it making landfall on the Korean Peninsula on September 6 or 7. As of the evening of September 2, Haishen had sustained winds of 130 kilometers (80 miles) per hour, with predictions that it could strengthen to category 4 strength while moving over the extremely warm water of the tropical Western Pacific.

## **11.2 World's strongest storm in 2020 makes landfall in the Philippines**

**Source:** [livemint.com](https://www.livemint.com), 1 November, 2020

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- An average of 20 cyclones pass through disaster-prone Philippines every year
  - Categorized by the US Joint Typhoon Warning Center as a super typhoon, it's now packing maximum sustained winds of 225 kilometers per hour.



**This Saturday, Oct. 31, 2020, satellite image released by NASA Worldview, Earth Observing System Data and Information System (EOSDIS) shows a typhoon locally known as Goni moving around the Philippines. The super typhoon slammed into the eastern Philippines with “catastrophic violent winds” early Sunday and about a million people have been evacuated in its projected path, including in the capital where the main international airport has been ordered closed, officials said. (NASA via AP) (AP)**

The world's strongest storm this year repeatedly slammed into the eastern part of the Philippines on Sunday, bringing "catastrophic violent winds" in what weather experts say is set to be the hardest landfall on record.

Super Typhoon Goni first hit land before dawn Sunday over Catanduanes province, and subsequently pummeled Albay, according to the weather bureau. It's expected to cross the southern Luzon and Metro Manila area from the afternoon before exiting land this evening or Monday, bringing "intense" rain to the capital.

"Catastrophic violent winds and intense to torrential rainfall associated with the region of the eyewall and inner rainbands of the typhoon is prevailing or expected within the next 12 hours," according to the 8 a.m. advisory. "This a particularly dangerous situation."

With winds of 195 miles per hour, "Goni is the strongest landfalling tropical cyclone" in history, said Jeff Masters, a meteorologist with Yale Climate Connections and co-founder of Weather Underground. The previous record was held by Super Typhoons Meranti and Haiyan, which also made landfall in the Philippines in 2016 and 2013 respectively.

Categorized by the U.S. Joint Typhoon Warning Center as a super typhoon, it's now packing maximum sustained winds of 225 kilometers per hour and gusts of 310 kilometers per hour, up from 280 kilometers an hour at the 5 a.m. update when it first made landfall.

Authorities will shut Manila's international airport to all flights for 24 hours from 10 a.m. local time Sunday as Goni approaches, the Manila International Airport Authority said on its website. The capital, along with other areas, will face "heavy to intense with at times torrential rains," according to the advisory for the storm.

Flag carrier Philippine Airlines canceled 20 international and 25 domestic flights for Sunday and Monday, according to its advisory.

Nearly 800,000 people have fled their homes in Albay province in the main Luzon island, while 200,000 more have been evacuated in nearby provinces, Ricardo Jalad, executive director of the Philippines' disaster risk-monitoring agency said. Dozens of areas, including Metro Manila, were placed under storm alert.

The cyclone comes days after Typhoon Molave lashed the Southeast Asian nation, leaving at least 22 dead and causing a minimum of 1.81 billion pesos (\$37.4 million) of damage to crops, before heading to Vietnam. Goni is tracking a similar route.

An average of 20 cyclones pass through disaster-prone Philippines every year, which will likely complicate the nation's fight against the coronavirus as hundreds of thousands of people are evacuated from typhoon-hit areas. In 2013, Haiyan, one of the strongest typhoons recorded, struck the Southeast Asian nation and killed more than 6,300 people.

Coconut, rice and corn plantations may suffer severe losses. Typhoon Goni could damage more than 928,000 hectares of land planted with rice and 58,431 hectares of corn, the Department of Agriculture estimates.

The storm can have a "high humanitarian impact," the Global Disaster Alert and Coordination System said on its website, adding that nearly 50 million people are at risk. Another typhoon, Atsani, is forecast to enter Philippine territory on Sunday but is less likely to bring severe weather over the next three days, according to the nation's weather forecaster.

The Philippines' first catastrophe bond, which provides \$150 million of tropical cyclone disaster insurance protection sourced from the capital markets, may be triggered, according to Artemis, which monitors catastrophe bonds, insurance-linked securities and weather risk markets.

### **11.3 'Extremely dangerous' Hurricane Eta makes landfall in Nicaragua as Category 4 storm**

**Source:** [usatoday.com](https://www.usatoday.com), 3 November, 2020



**Children sit on a beach house window as Hurricane Eta approaches in Bilwi, Puerto Cabezas, Nicaragua on Nov.2.2020 Eta rapidly intensified to a category 4 hurricane on Monday as it bore down on Caribbean coast on Nicaragua and Honduras threatening the Central America countries with catastrophic winds and floods.**

Hurricane Eta made landfall Tuesday afternoon along the northeastern coast of Nicaragua as an "extremely dangerous" Category 4 hurricane.

The storm was expected to bring "life-threatening storm surge, catastrophic winds, flash flooding and landslides across portions of Central America" this week, the National Hurricane Center said.

Heavy rain from Eta's outer bands already were causing rivers to overflow across Central America. As of 4 p.m. ET Tuesday, the center of Hurricane Eta was about 15 miles south-



southwest of Puerto Cabezas, Nicaragua, the Hurricane Center said.

The storm had strengthened rapidly Monday. Winds at one point hit 150 mph.

Tuesday afternoon, maximum sustained winds were near 140 mph with higher gusts. Weakening will begin after the center moves inland later Tuesday. Hurricane-force winds extended outward up to 25 miles from the center, and tropical-storm-force winds extended up to 125 miles.

Early Tuesday, Guillermo González, director of the Nicaragua's emergency management agency, said in a news conference that as Eta began to make landfall there were reports of corrugated metal roofs flying off homes, trees, poles and power lines falling, and rivers rising in the coastal area.

No deaths or injuries were reported, he said.

The storm made landfall near Bilwi, the main coastal city in the region. About 10,000 people were in shelters in that city, and an equal amount were sheltered in smaller towns across the region, he said. The area had been lashed with strong winds and heavy rain for hours.

Authorities in Nicaragua and Honduras had moved people Monday from outer islands and low-lying areas to shelters. Residents scrambled to shore up their homes, but few structures along Nicaragua's remote Caribbean coast were built to withstand such force.

At a shelter in Bilwi, farmer Pedro Down waited late Monday for Eta's arrival. "When it comes it can rip off all the (roof) and destroy the house, so you have to look for a safer place," he said, cradling a baby in his arms. "So I came here to save our lives."

Along Honduras' northern Caribbean coast, torrential rains from Eta's outer bands caused some rivers to overwhelm their banks Monday, forcing evacuations.

It could be only the beginning of Eta's destruction. The storm was forecast to spend the week meandering over Central America, dumping rain measured in feet, not inches.

Forecasters said central and northern Nicaragua into much of Honduras could get 15 to 25 inches of rain, with 35 inches in isolated areas. Heavy rains also were likely in eastern Guatemala, southern Belize and Jamaica.

A storm surge of about 21 feet above normal tides was possible for the coast of Nicaragua, forecasters said.

Forecasters say Eta could have similar impact on Central America to that of Hurricane Mitch from 1998, according to AccuWeather. Mitch struck around the same point of the

season, meandered over Central America for days and unloaded torrential rainfall. More than 11,000 people lost their lives because of catastrophic flooding from Mitch, AccuWeather said.

Eta is the 12th hurricane of the 2020 Atlantic hurricane season and the 28th named Atlantic storm this season, tying the 2005 record for named storms, said Philip Klotzbach, meteorologist at Colorado State University, who specializes in Atlantic basin hurricane forecasts. Eta is the strongest Atlantic hurricane this late in the calendar year since Otto in 2016, Klotzbach said. Hurricane season continues until Nov. 30.



**Hurricane Eta makes landfall in Bilwi, Puerto, Cabezas Nicaragua, on Tuesday. The storm lashed the north coast of Nicaragua with heavy rains and winds of more than 130 mph**

#### **Will Eta affect the US?**

It's still too early to determine whether the United States will feel any impact from Hurricane Eta. After landfall, Eta is forecast to curve back into the Caribbean, and most models showed it passing over or through Cuba.

Beyond Central America, Eta or a spin-off storm from Eta may meander northeast over the Caribbean Sea. In that case, effects in Florida, Cuba and the Bahamas would not be out of the question during the second week of November, according to AccuWeather. It also is possible that Eta dissipates over Central America.



**Florida remains in Forecast path of Tropical Depression Eta**

## 12. Smog & Urban Air Pollution

### 12.1 Air pollution in world's major cities back to pre-lockdown levels

**Source:** [airqualitynews.com](https://airqualitynews.com), 24 September, 2020

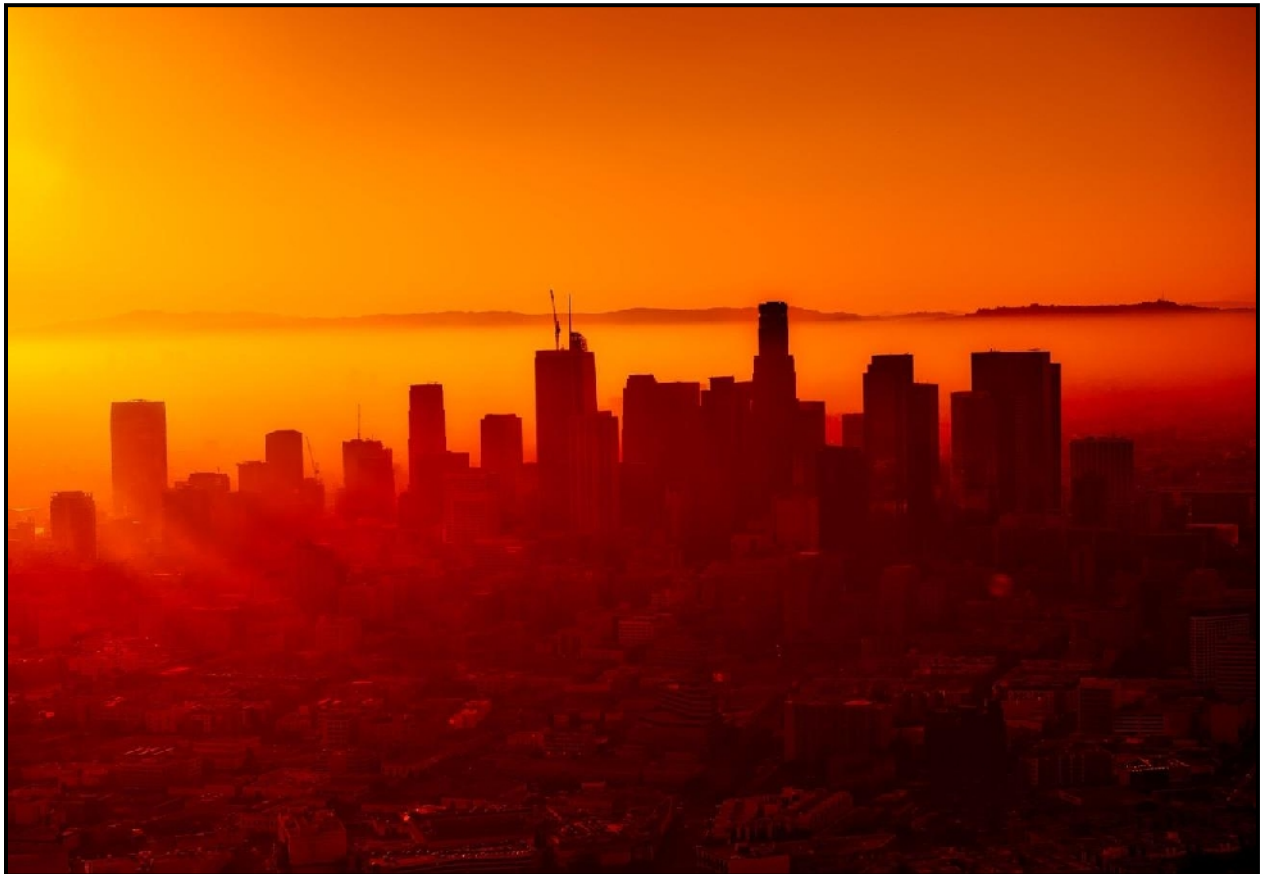
Air pollution in major global cities has seen a significant surge following the easing of lockdown restrictions, according to recent analysis conducted by Instant Offices.

Instant Offices used data from the World Air Quality Index in order to compare particulate matter (PM<sub>2.5</sub>) levels in 15 major cities between February and May and June and July.

During peak lockdown, air pollution fell in Hong Kong by 16%, in Sydney by 13%, and in Singapore by 14%.

However, the researchers found that as lockdown restrictions were eased Beijing, Los Angeles, Melbourne, Madrid, Cape Town and New York saw a double-digit increase in PM2.5 levels.

New York saw a considerable dip in PM2.5 during peak lockdown when pollution levels plunged by 59%. However, as things in the city slowly started to return to normal there has been a 33% increase in air pollution with pollution almost reaching pre-lockdown levels.



John Williams, head of marketing at The Instant Group said: 'Earlier this year, we saw an unprecedented pause in global activity as most countries went into lockdown to stop the spread of COVID-19.

'Just two weeks in, PM2.5 levels plunged across some of the world's busiest cities, leading to improved air quality, increased visibility and even some historical moments, like the Himalaya's becoming visible for the first time in 30 years in India.

'Now, as life slowly returns to normal around the world, our air quality comparison across 15 major cities reveals that while some are still benefitting from cleaner air, others have seen pollution skyrocket.'

In related news, researchers from the University of Leeds found that the two most harmful air pollutants, particulate matter (PM2.5) and ozone, hardly declined during the lockdown period in China.

The researchers found that while concentrations of nitrogen dioxide (NO2) did show improvements, the two most harmful pollutants to human health hardly declined.

## **12.2 Smog Tied to Raised Risk for Parkinson's, Alzheimer's Disease**

**Source:** usnews.com, 20 October, 2020

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TUESDAY, Oct. 20, 2020 (HealthDay News) -- As the air people breathe gets dirtier, their odds for serious neurological disorders such as Parkinson's disease, Alzheimer's and other dementias rises, new research shows.

The long-term study of more than 63 million older Americans can't prove cause and effect, but does show a strong association between air pollution and brain disorders. The researchers said the link was seen even at levels of fine particulate (PM2.5) pollution that are deemed safe by the U.S. Environmental Protection Agency.

"Our study builds on the small but emerging evidence base indicating that long-term PM2.5 exposures are linked to an increased risk of neurological health deterioration, even at PM2.5 concentrations well below the current national standards," researcher Xiao Wu, a doctoral student in biostatistics at Harvard T.H. Chan School of Public Health in Boston, said in a school news release.

Dr. Alessandro Di Rocco directs the Movement Disorders Program at Northwell Health in Great Neck, N.Y. He wasn't involved in the new study, but said the findings aren't surprising.

"Over the past few years there has been growing evidence that environmental exposure to chemical substances, including pesticides and air pollution, may cause or facilitate the biological changes leading to neurodegeneration," said Di Rocco.

In the new study, Wu's team looked at data on hospital admissions in 2000 to 2016 from more than 63 million Medicare patients. The researchers linked these with estimated PM2.5 concentrations by the ZIP code where each patient lived.

The investigators found that for each 5 microgram per cubic meter increase in annual PM2.5 concentrations, there was a 13% greater risk for hospital admissions for Parkinson's disease, Alzheimer's disease and other dementias.



Women, white people and urban dwellers were particularly susceptible, the researchers noted.

The highest risk for Parkinson's disease was among older adults living in the Northeast, while those in the Midwest showed the strongest risk for Alzheimer's and other dementias.

The bottom line, according to co-researcher Antonella Zanobetti: "Our U.S.-wide study shows that the current standards are not protecting the aging American population enough, highlighting the need for stricter standards and policies that help further reduce PM2.5 concentrations and improve air quality overall." Zanobetti is a principal research scientist in the Harvard Chan School's department of environmental health.

For his part, Di Rocco said the new study is "unique in its scope and size, demonstrating a strong nationwide correlation between degree of air pollution and risk for neurological disorders of aging."

He believes that the rise in neurodegenerative disease among Americans can't be explained by age alone. That means that "identifying air pollution as an important environmental risk factor can lead to a public health intervention that may diminish over time the occurrence of these neurological disorders," Di Rocco said.

### **12.3 Air Pollution Responsible for Over 6.6 Million Deaths Worldwide in 2020, Study Finds**

**Source:** [ecowatch.com](https://www.ecowatch.com/21-October-2020), 21 October, 2020

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An annual comprehensive report on air pollution showed that it was responsible for 6.67 million deaths worldwide, including the premature death of 500,000 babies, with the worst health outcomes occurring in the developing world, according to the State of Global Air, which was released Wednesday.

The State of Global Air 2020 looked at the effects of air pollution on health outcomes in 2019 and found that conditions are getting worse, as it moved up from the fifth leading cause of death worldwide to the fourth leading cause. Only high-blood pressure, smoking and poor diet surpass air pollution.

The State of Global Air 2020 is a joint collaboration produced annually by the Health Effects Institute and the Institute for Health Metrics and Evaluation's Global Burden of Disease project.



**Rashtrapati Bhavan engulfed in smog, at Rajpath, on Oct. 12, 2020 in New Delhi, India.**

One reason that air pollution moved up in the list of leading causes of death is that this year's report was able to account for infant death due to air pollution. The report noted that roughly half a million babies died due to poor air quality, with roughly two-thirds of those deaths due to poor indoor air from burning charcoal, wood and animal dung for cooking, according to The Guardian.

"We don't totally understand what the mechanisms are at this stage, but there is something going on that is causing reductions in baby growth and ultimately birth weight," said Katherine Walker, principal scientist at the Health Effects Institute, as The Guardian reported. "There is an epidemiological link, shown across multiple countries in multiple studies."

India was the worst hit country with 116,000 infant deaths linked to air pollution, while Sub-Saharan Africa saw 236,000 infant deaths due to poor air quality, according to the report, as Agence-France Presse (AFP) noted. Most of the complications were due to low birth weight and premature birth, which leaves a baby's lungs fragile.

It is not just babies that need to be protected. Recent studies have also noted that exposure to air pollution for mothers contributes to low birth weight and premature births, according to The Tribune in India.

"An infant's health is critical to the future of every society, and this newest evidence suggests an especially high risk for infants born in South Asia and sub-Saharan Africa," said Dan Greenbaum, president of the Health Effects Institute, the AFP reported.

According to the report, the most smog or PM2.5 air pollution for 2019 was in India, followed by Nepal, Niger, Qatar and Nigeria. The report noted that India's air quality has been steadily decreasing since 2010. While most of the 20 most populous countries have decreased air pollution over the last decade, India, Nigeria, Pakistan, Bangladesh, and Japan have seen air pollution increase, as The Hindustan Times reported.

Long-term exposure to air pollution contributed to 1.67 million deaths in India last year.

"Given the high exposure and staggering health burden of air pollution, India must show urgency and recognize air pollution as a regional-scale problem," said Sagnik Dey, associate professor at the Indian Institute of Technology in Delhi, to The Hindustan Times. "The National Clean Air Program should be expanded beyond the urban centers with an air-shed approach prioritizing the local and regional mitigation measures to achieve clean air goals for India."

Epidemiologists have compared the state of air in developing countries to Victorian London from 150 years ago.

"This is not the air pollution we see in modern cities [in the rich world] but that which we had 150 years ago in London and other places, where there were coal fires indoors," said Beate Ritz, professor of epidemiology at UCLA, to The Guardian. "Indoor air pollution has not been at the forefront for policymakers, but it should be."

## **13. Wildfire**

### **13.1 19 Killed In Massive China Forest Fire**

**Source:** [ndtv.com](http://ndtv.com), 31 March, 2020

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State television footage showed large flames shooting into the sky from the mountains above the city of Xichang in Sichuan province, turning the sky orange.

Beijing, China: Eighteen firefighters and one forestry guide died while fighting a huge forest fire in southwestern China, the local government said Tuesday.



### **18 firefighters and one forestry guide died while fighting a huge forest fire in southwestern China**

State television footage showed large flames shooting into the sky from the mountains above the city of Xichang in Sichuan province, turning the sky orange.

Heavy clouds of smoke billowed above the buildings and roads of the city, which has a population of some 700,000 people.

The blaze started near Xichang in the southwestern province's mountainous Liangshan prefecture at 3:00 pm (0700 GMT) on Monday, "directly threatening the safety of Xichang city", the city government said in a Weibo statement on Tuesday morning.

More than 140 fire engines, four helicopters and nearly 900 firefighters have been sent to tackle the blaze, according to local officials.

In total over two thousand emergency workers are involved in rescue efforts to contain the blaze and more than 1,200 local people have been evacuated.

Helicopters were still battling the blaze Tuesday morning.

Several forest fires have broken out in the same prefecture in recent days, reported state news agency Xinhua.

Last April, twenty-seven firefighters were killed in a huge forest fire in Muli County in the same prefecture. Authorities deployed 700 firefighters to the scene.

### **13.2 First big Southern California wildfire of 2020 keeps on raging**

**Source:** indiatoday.in, 4 August, 2020

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As of Monday morning, wildfire was just 5% contained and along with coronavirus, precautions were made for added stress at an evacuation center.



#### **A brush fire burns at the Apple Fire in Banning, Calif., Saturday, Aug. 1, 2020**

A huge wildfire in mountains east of Los Angeles that is Southern California's biggest blaze so far this year was still raging Monday, with thousands of people forced to evacuate their homes.

The blaze in Riverside County, among several wildfires across California, had consumed more than 41 square miles (about 106 square kilometers) of dry brush and timber since it broke out Friday evening, according to the California Department of Forestry and Fire Protection.



As of Monday morning, it was just 5% contained and the fire along with coronavirus precautions made for added stress at an evacuation center, said John Medina, an American Red Cross spokesman.

Volunteers used to “close contact” with evacuees have had to adjust their approach during a time of social distancing, Medina said.

“I mean, that’s part of the recovery of a disaster, is that you have to show warmth and love and caring. And that’s hard when you’re standing six feet away. So that’s the biggest challenge,” Medina told KESQ-TV.

Bill Boehm helped his mother evacuate her home with her three horses and said the pandemic hasn’t stopped people from coming together to assist each other.

“Everyone seemed to be wearing masks and such, so that type of precaution was still going on,” Boehm told the news station.

Investigators are trying to determine the cause of the blaze that began as two adjacent fires in Cherry Valley, a rural area near the city of Beaumont, about 85 miles (137 kilometers) east of downtown Los Angeles.

Flames raced along brushy ridge tops and came close to houses while firefighters attacked from the ground and air.

One home and two outbuildings were destroyed, California fire officials said. No injuries were reported.

In Northern California, evacuations were ordered after a wildfire that sparked Sunday afternoon spread quickly and burned near homes near the East Park Reservoir in Colusa County. Complicating firefighters’ efforts were temperatures in the area north of Sacramento were expected to hit the upper 90s (around 36 Celsius) by Monday afternoon.

On California’s central coast, a fire in San Luis Obispo County was 60% contained Monday after burning more than 2 square miles (6 square kilometers) of brush east of the community of Santa Margarita. Two structures were destroyed but officials said it was unclear whether they were homes.

In Riverside County, officials allowed flames from the so-called Apple Fire to run up the side of Mount San Gorgonio, an 11,000-foot (3,350-meter) peak, because it wasn’t safe to let crews work in such steep, rugged terrain, said Lisa Cox, a spokeswoman for the U.S. Forest Service.

Evacuation orders and advisories were issued for about 2,500 homes in mountain, canyon and foothill neighborhoods. Campgrounds and hiking trails were closed in the San Geronio Wilderness area of the San Bernardino National Forest.

A huge smoke plume was visible for miles around and contributed to poor air quality.

The temperature hit 109 degrees (43 Celsius) Sunday in nearby Palm Springs but conditions were expected to cool slightly on Monday.

### **13.3 The Amazon is burning in 2020 again. It can just lead to more pandemics**

**Source:** theprint.in,4 October,2020

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According to the Global Fire Emissions Database project run by NASA, fires in the Amazon in 2020 surpassed those of 2019.



#### **Smoke rises above the Amazon rainforest**

The fires in the Amazon region in 2019 were unprecedented in their destruction. Thousands of fires had burned more than 7,600 square kilometres by October that year. In 2020, things are no better and, in all likelihood, may be worse.

According to the Global Fire Emissions Database project run by NASA, fires in the Amazon in 2020 surpassed those of 2019. In fact, 2020's fires have been the worst since at least 2012, when the satellite was first operated. The number of fires burning the Brazilian Amazon increased 28 per cent in July 2020 over the previous year, and the fires in the first week of September are double those in 2019, according to INPE, Brazil's national research space agency.

Despite the surge in fires, international attention has waned in 2020, likely due to the COVID-19 pandemic. Yet the degradation of the Amazon rainforest has profound consequences from climate change to global health.

### **Global climate implications**

The Amazon rainforest covers approximately eight million square kilometres — an area larger than Australia — and is home to an astounding amount of biodiversity.

It helps balance the global carbon budget by absorbing carbon dioxide from the atmosphere, and plays a key role in the global water cycle, stabilizing global climate and rainfall. A nine nation network of Indigenous territories and natural areas have protected a massive amount of biodiversity and primary forest.

Yet these lands are under siege. As of 2019, an estimated 17 per cent of the Amazon's forest cover has been clear-cut or burned since the 1970s, when regular measurements began and the Amazon was closer to intact.

As the rainforest bleeds biomass through deforestation, it loses its ability to capture carbon from the atmosphere and releases carbon through combustion. If the annual fires burning the Amazon are not curtailed, one of the world's largest carbon sinks will progressively devolve into a carbon faucet, releasing more carbon dioxide than it sequesters.

While the global impacts are dire, the local impacts of these fires are also significant. Persistent poor air quality, which extends far into Brazil and other regions of South America, including in metropolitan centres like São Paulo, can lead to health problems.

As roads are built and forests are cleared for timber production and agriculture, a checkerboard of tropical forest edges is created. These destructive activities can lead to rapid extinctions and a severe loss of species richness anywhere that human encroachment occurs.

Many researchers predict that deforestation is propelling the Amazon towards a tipping point, beyond which it will gradually transform into a semi-arid savanna. If the deforestation of the rainforest continues past a threshold of 20-25 per cent total

deforestation, multiple positive feedback loops will spark the desertification of the Amazon Basin.

### **Global health implications**

Zoonotic diseases, like SARS-CoV-2, the virus that causes COVID-19, are on the rise. Understanding the root causes of these spillover events that move viruses from animals to humans gives us insight into how to prevent future zoonotic outbreaks. The degradation and fragmentation of tropical rainforests such as the Amazon may be a key factor in this process.

The checkerboard of forest edges increases the potential points of contact between humans and wildlife, which in turn increases the likelihood of viral transmission and the emergence of novel human diseases. Intact forests and high levels of biodiversity, on the other hand, can provide a “dilution effect” associated with a lower prevalence and spread of pathogens.

The present pandemic may well have had an environmental genesis. Maintaining the Amazon’s current high level of biodiversity is vital, both for the health of the global ecosystem and because, otherwise, the Amazon could become a future hotspot of emerging diseases. When we protect the global ecosystem, we also protect ourselves from emerging zoonotic diseases.

Interventions are complex, but the protection of Indigenous territories, the restoration of already degraded lands and, most importantly, continued international awareness of political dynamics and consumer choices, all offer us ways to avert oncoming tragedy. If we do not take a longer view of this pandemic and look upstream for drivers and causes, pandemics will continue to emerge.

## **13.4 It’s Not Just the West. These Places Are Also on Fire**

**Source:** nytimes.com,16 September,2020

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Extreme temperatures and more severe droughts, the result of human-caused climate change, have created a world that’s ready to burn.

Wildfires are devastating the American West, but the United States isn’t the only place on Earth that’s burning. This year, other countries have also experienced their worst wildfires in decades, if not all of recorded history.

In each case, the contributing factors are different, but an underlying theme runs through the story: Hotter, drier seasons, driven by the burning of fossil fuels, have made the world more prone to erupt in flames.

“We don’t have a fire problem; we have many fire problems,” said Stephen J. Pyne, an emeritus professor at Arizona State University who studies wildfires and their history. “One, obviously, is a deep one. It has to do with fossil fuels and climate.”

Here’s a look at some of the worst recent blazes and how humans played a role in them.

### **The Arctic and Siberia**



**The Khanty-Mansi region of western Siberia in July.Credit...Russia's Aerial Forest Protection Service, via Reuters**

The Arctic as a whole is experiencing warming at more than twice the pace of the rest of the world. Record-low snow cover, high temperatures and dry soils, almost certainly a result of human-caused climate change, have all contributed to the fires.

This summer, portions of the Arctic shattered wildfire records set just last year, which at the time was the worst fire season in 60 years. The Russian town of Verkhoyansk became the first place above the Arctic Circle to experience temperatures over 100 degrees



Fahrenheit, or about 38 Celsius, in June. Record heat also thawed combustible, but usually frozen, peatland, which fed wildfires that burned an area roughly the size of Belgium.

While no lives were lost, smoke smothered the Russian countryside and the burned land emitted a surge of planet-warming carbon dioxide — about as much as Norway emits annually.

## **Indonesia**



### **The Sebangau National Park in Central Kalimantan Province, Indonesia, last year**

In the humid tropics, climatic conditions play a smaller role in wildfires. There, clearing and burning land for agriculture is the primary cause of fires.

In July, Central Kalimantan Province on Borneo declared a state of emergency as fires burned out of control.

That followed severe fires in Indonesia last year and in 2015, the year of a drought in the country that was linked to El Niño, the periodic warming of the tropical Pacific Ocean that can affect weather worldwide.

Even without dry conditions, though, agricultural practices played a crucial role in the fires.

“It’s very, very rare to see fires naturally,” said Ruth DeFries, a professor of sustainable development at Columbia University. “When we see fires in the humid tropics, there is a human ignition source behind it.”

“Without the land use, you could have dry conditions associated with El Niño and not have fires,” Dr. DeFries said.

## **Brazil**



### **A scorched section of the Pantanal wetlands in Brazil on Monday**

The worst fires on record are burning now in the Pantanal wetlands in the country’s south. Farther north, in the Amazon rain forest, tens of thousands of fires are still burning after a summer of blazes. In June, Brazilian officials called the Amazon fires the worst in 13 years.

As in Indonesia, deforestation for agriculture is a primary culprit. Farmers and ranchers cut down trees on the edge of the rainforest and set them on fire to clear the land for crops or grazing. But climate change is a force multiplier: During droughts like the current one in the country, those fires penetrate farther into forests, burning more trees and causing more damage.

Unlike the wildfires in California, which burn tree canopies, fires in the Amazon often creep along the forest floor “essentially no higher than my knee,” said Jennifer Balch, an associate professor of geography at the University of Colorado Boulder and director of the university’s Earth Lab. “And they can go for a very long period of time.”

## **Argentina**



### **Wildfires raged across the Paraná River from Rosario, Argentina, in July**

Fires are raging now across grasslands in the Paraná Delta and around farmland in central Argentina, where farmers and ranchers have been burning fields for a century to improve their soil. This year, the fires got out of control.

“It’s easy for fires to leave the perimeters of someone’s property and just burn huge areas,” said Virginia Iglesias, a research scientist at the Earth Lab at the University of Colorado Boulder who lived in Argentina most of her life.

“It’s the end of winter, and it’s been a really, really dry winter,” Dr. Iglesias said. “These exceptionally dry conditions in central Argentina, and in many other areas of the country, create conditions that are perfect for fires once you have fuel.”



## Australia



### **Wildlife rescuers in Peak View, Australia, tranquilized a kangaroo that was burned in a wildfire in February before transporting it to a recovery center**

At the beginning of this year, Australia was just emerging from its worst wildfire season on record. Thousands of homes were lost and millions of acres burned. At least 30 people died. Estimates of the number of animals killed range between a few hundred million and a billion.

Researchers found that human-caused climate change played a significant role in the fires, making the high-risk conditions that led to widespread burning at least 30 percent more likely than in a world without global warming.

Now, as the Southern Hemisphere heads into spring, Australians are bracing themselves for a new season of blazes. Officials say they doubt this year's fires will be as severe, because there is simply not much left to burn, but homeowners are still hastening to clear shrubs and weeds, and complete prescribed burns.

In the short term, Dr. Pyne said, we can mitigate fire risks by designing more fire-safe communities, creating better evacuation plans and improving fire management on wild lands.

“Prescribed fire is clearly going to be a part of that,” he said. “If you think of fire as a contagion, which in many ways it is, prescribed burning is part of herd immunity.”

When it comes to human causes of climate change, “We need to take action, but that will take a long time,” Dr. Pyne said. “We are going to be living with an enhanced fire world for decades, at least.”

## **14. Volcanic Eruption**

### **14.1 Eruption at Kuchinoerabujima volcano, Japan**

**Source:** watchers.news, 11 January, 2020



**Japan's Kuchinoerabujima volcano erupted at 06:05 UTC on January 11, 2020, ejecting volcanic material up to 300 m (984 feet) from the crater of Mount Shindake. This is the first eruption at the volcano since February 2, 2019. Kuchinoerabujima is a volcano island in Satsunan Islands, Japan, about 120 km (75 miles) SSW of Kagoshima city and about 1 100 km (685 miles) WSW of Tokyo. A series of eruptions with pyroclastic flows were recorded in December 2018 and January 2019.**

Volcanic ash cloud reached up to 2.7 km (9000 feet) above sea level.

There were no pyroclastic flows produced and no evacuation orders were issued, the Japan Meteorological Agency (JMA) said.

The Alert Level remains at 3 (on a scale of 5) since 15:15 UTC on October 27, 2019 (00:15 JST, October 28), after a large earthquake hit the island.



"There is a possibility that an eruption will occur of a magnitude similar to the one in January when pyroclastic flows reached a point 1.9 km (1.2 miles) from the crater," JMA said at the time.

In 2015, pyroclastic flows reached all the way to the coast, forcing all residents to evacuate.

Residents (currently about 100 of them) and tourists are warned not to approach the danger zone.

### **Geological summary**

A group of young stratovolcanoes forms the eastern end of the irregularly shaped island of Kuchinoerabujima in the northern Ryukyu Islands, 15 km (9.3 miles) west of Yakushima. The Furudake, Shindake, and Noikeyama cones were erupted from south to north, respectively, forming a composite cone with multiple craters.

The youngest cone, centrally-located Shintake, formed after the NW side of Furutake was breached by an explosion. All historical eruptions have occurred from Shintake, although a lava flow from the S flank of Furutake that reached the coast has a very fresh morphology.

Frequent explosive eruptions have taken place from Shintake since 1840; the largest of these was in December 1933. Several villages on the 4 x 12 km (2.5 x 7.5 miles) island are located within a few kilometers of the active crater and have suffered damage from eruptions. (GVP)

## **14.2 What the Philippines volcano 'worst-case scenario' could look like**

**Source:** [nationalgeographic.com](https://www.nationalgeographic.com/news/2020/1/13-philippines-volcano-erupts/), 13 January, 2020

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With millions of people at risk, experts are looking to past big eruptions to better understand the unique hazards this peak can produce.

Normally, the view from the webcam sitting inside Lake Taal in the Philippines shows clouds drifting over the lake's placid waters, as verdant slopes rise in the distance. But on the afternoon of January 12, this peaceful scene was suddenly interrupted by a torrent of hot ash and gas, before the camera was smothered by darkness.

The outpouring marked the beginning of an unnerving eruption sequence at Taal Volcano, which sits on the island of Luzon. On the first day, steam-driven blasts flung ash nine miles into the sky. Startling displays of volcanic lightning ricocheted around this dark maelstrom, and a myriad of intense volcanic earthquakes rocked the region. On January 13, the

eruption became somewhat more magmatic, as lava fountains started shooting up from the main crater.



**An ash cloud rises over the lake as Taal Volcano erupts in the Philippines on January 12. The ongoing eruption is blanketing the region with debris and has already spurred evacuations, school closings, and flight cancellations.**

Ash continues to blanket the Philippines as of press time, including in the capital city of Manila, about 62 miles north of the volcano. Flights have been cancelled, schools and other public institutions have closed, and tens of thousands of people have been evacuated from both the volcanic isle within Lake Taal and from the vast shorelines around it.

So far, no casualties have been reported, and there is a chance this eruption could fizzle out. Still, many people likely remain in high-risk zones, and “the biggest bang is not always at the beginning of an eruption,” says Jenni Barclay, a volcanologist at the University of East Anglia. “On a timescale much longer than the threat of a hurricane, something else could happen that’s even bigger.”

Past eruptions at Taal demonstrate that this volcano has a profoundly lethal capability, claiming thousands of lives throughout recorded history. If the latest event does become

more explosive—a possibility that has scientists deeply concerned—it could yield a surfeit of volcanic hazards, from rocky debris bouncing across the lake to overwhelming tsunamis.



“This is definitely a volcano to be taken seriously,” says Beth Bartel, an outreach specialist at UNAVCO, a geoscientific consortium of universities and scientific institutions.

### **Telling Taal tales**

With a plentiful supply of magma, Taal is one of the Philippines’ most active volcanoes, having erupted dozens of times in the past few centuries. Some of those past eruptions rank among the most powerful in the country’s history. But Taal Volcano is visually deceptive.

Many of these historical eruptions took place on the volcanic island in the middle of the more expansive Lake Taal. However, the entire volcano is far larger than this rocky outpost; it is a giant cauldron-shaped edifice known as a caldera. Much of the caldera is hidden by Lake Taal, and only a small portion of the volcano sits above the waves.

This is a problem not only for those who live on the central volcanic isle, but also for the 25 million people living within 60 miles of the volcano, including a huge number on Lake Taal’s shorelines.

Due to the continuing intense volcanic earthquakes and eruptive activity, the Philippine Institute of Volcanology and Seismology, or PHIVOLCS, has set the alert level to four, meaning that a hazardous explosive eruption is possible within hours to days.

### **A link to the past**

To understand what that might mean, experts can look to the past for hints. The most recent past eruption at Taal was a minor steam-driven event in 1977, notes Ed Venzke, the database manager at the Smithsonian Institution's Global Volcanism Program.

While there may not have been an eruption for four decades, the volcano has “clearly been restless for a very long time,” says Amy Donovan, an expert in volcanic risk at the University of Cambridge. Although often moderate when compared to other volcanic eruptions, many of Taal's paroxysms have been violently explosive and, due to the huge number of people living on or close to it, frequently fatal.

Greater ash production that often accompanies bigger booms will exacerbate matters. Ash can pollute water supplies, damage electronic infrastructure, smother agriculture, and kill off farm animals and pets. It can also kill people if they inhale enough of it; breathing in glassy ash is always bad, but people with pre-existing respiratory ailments are most at risk, as are the very young and the elderly.

Either through explosive mixing of magma and water, or through magmatic activity alone, Taal has also previously produced thundering, high-velocity clouds of hot ash, debris, and gas named pyroclastic flows that have killed thousands of people in mere moments. Boris Behncke, a volcanologist at Italy's National Institute of Geophysics and Volcanology, shared some examples on Twitter, including flows from a 1911 eruption that killed 1,335 people on the central island.

A reasonable worst-case scenario would not just feature pyroclastic flows, but also low-altitude surges of ash and scorching gas that, due to their low density, can literally bounce over the water, says Donovan. These base surges—a term borrowed from nuclear explosion science—“can sandblast everything in their path, including the lake shore on the other side,” Bartel says.

What's more, if explosions dislodge parts of the volcanic island that then fall into Lake Taal, that could generate tsunamis that will swamp the lake's shorelines. As an eruption at Indonesia's Anak Krakatau showed in December 2018, it only takes a small volcanic collapse to generate a lethal tsunami.

Even if there is no tsunami, falling debris and volcanic earthquakes can cause peculiar and potentially destructive waves known as seiches; if that debris has enough energy, it can miss the lake entirely and instead land directly on shore.

## **Back to Taal's future**

Of course, forecasting eruptions is fraught with difficulty. Donovan points out that we don't know how the properties of the magma under Taal have changed since the 1977 eruption. And while looking to old eruptions for clues is helpful, the past can only tell you so much.

"Every eruption is different," Venzke says. "There's nothing guaranteed."

It's possible that this grim future may not transpire, and that we've seen the worst of what Taal has to offer this time, Donovan says: "It might just generate a bit of ash, have a few fire fountains, then go back to sleep again."

Alternatively, what we are seeing here could perhaps be the opening salvo of a far longer eruption sequence, says James Hickey, a geophysical volcanologist at the University of Exeter. And even if the eruption becomes more explosive, some, all, or none of these hazards may occur.

Still, it is sensible for people in the region to assume the worst-case scenario is unfolding and to take reasonable, responsible action, Donovan says. If you are still around Taal and haven't yet heeded instructions to evacuate, it's best to immediately get away from low-lying areas near the volcano. Always listen to local authorities for updates.

In the meantime, volcanologists will wait with bated breath, since lessons from the past show just how dangerous this particular peak can be.

"When I saw yesterday that Taal was in eruption," Bartel says, "I was somewhat horrified."

## **14.3 Volcano erupts on ecologically sensitive Galapagos island**

**Source:** [phys.org](https://phys.org), 14 January, 2020

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A volcano erupted on an uninhabited island in the Galapagos, Ecuadorian authorities said, spewing lava on the ecologically sensitive environment.

La Cumbre volcano on Fernandina island, one of the youngest in the archipelago, began erupting Sunday evening, Galapagos National Park (PNG) officials said in a statement.

The 1,467 metre high (4,813 feet) volcano has a crack along its south-eastern flank and "a lava flow descends to the coast", PNG added.

The island is home to a number of species including iguanas, penguins, flightless cormorants, snakes and an endemic rat, and has "very important" ecological value, PNG said.





#### **Map of the Galapagos islands locating La Cumbre volcano which erupted on Jan**

Before the eruption, an earthquake with a magnitude of 4.7 was felt, according to the local Ecuadorian Geophysical Institute, followed by 29 aftershocks.

The volcano also erupted in June 2018.

The unique fauna of the UNESCO-listed Galapagos Islands—located 1,000 kilometres (620 miles) east of mainland Ecuador—helped English naturalist Charles Darwin develop his theory of evolution by natural selection.

#### **14.4 April 25, 2020 - Karymsky Volcano on the Kamchatka Peninsula**

**Source:** [modis.gsfc.nasa.gov](https://modis.gsfc.nasa.gov), 25 April, 2020

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Russian's Karymsky volcano is one of the most active volcanoes on the mountainous, volcano-studded peninsula of Kamchatka. Moderate gas-steam activity continued at Karymsky in mid- to late-April, 2020. On April 21, the Smithsonian Institution's Global Volcanism Program reported that a minor amount of ash was present in the volcano's gas-and-steam plumes and trace ash deposits were visible on the surrounding snow. Tokyo Volcanic

Ash Advisory Center (VAAC) reported that on

April 18 an ash plume rose to 1.5 km (5,000 feet) above sea level. The Aviation Color Code was raised to Yellow (the second lowest level on a four-color scale) on April 19.



The Kamchatka Volcanic Eruption Response Team (KVERT) warned that explosions up to 10,000- 13,100 ft (3-4 km) a.s.l. could occur at any time. Ongoing activity could affect low-flying aircraft.

The Moderate Resolution Imaging Spectroradiometer (MODIS) on board NASA's Terra satellite acquired a true-color image of snow-covered Kamchatka on April 18. A bright red "hot spot" marks a thermal anomaly, which is where the thermal bands on the instrument detected high temperatures. Located at Karymsky, this hot spot indicates volcanic activity. A gray steam-and-gas plume loaded with volcanic ash can be seen tracking to the northeast from Karymsky.

## 14.5 New eruption at Raung volcano, first since 2015, Indonesia

**Source:** watchers.news,16 July,2020



**A new eruption occurred at the Indonesian Raung volcano at 06:53 UTC (13:53 local time) on July 16, 2020. This is the first reported eruption of this volcano since its last eruptive phase ended in August 2015.**

According to Raung Volcano Observatory VONA issued 07:45 UTC, the eruption was recorded on seismogram with a maximum amplitude of 10 mm and a duration of 56 seconds.

The best estimate of ash-cloud top is around 3 432 m (10 982 feet) above sea level but may be higher than what can be observed clearly. The ash height data was supplied by ground observers. Ash-cloud moved to the north.

The Aviation Color Code was raised to Orange.

A new VONA (Volcano Observatory Notice for Aviation) was issued at 08:49 UTC, noting that ash emissions continue.

According to the Darwin VAAC advisory released at 08:30 UTC, volcanic ash is unidentifiable on satellite imagery due to meteorological clouds.

The last eruptive phase of this volcano took place from February 1 to August 22, 2015 -- Volcanic Explosivity Index (VEI) 3. Ash and lava emissions started after several weeks of tectonic rumblings beneath the surface.

At least 900 airplane flights into and out of Bali and other regional airports were canceled due to concerns about the ash clouds, which rose up to 6 km (20 000 feet) a.s.l. from July 15 - 21 and drifted as far as 340 km (211 miles) in multiple directions.

On July 16, BNPB reported that a dense gray-to-black ash plume rose as high as 2 km (6 560 feet) above the crater rim and drifted WNW. Incandescent lava at the summit was visible and tremor was continuous. Roaring and thumping sounds were reported by residents. Ashfall was reported in areas downwind, including Cumedak (19 km / 11.8 miles W) and Sumberjambe (13 km / 8 miles NW).

### **Geological summary**

Raung, one of Java's most active volcanoes, is a massive stratovolcano in easternmost Java that was constructed SW of the rim of Ijen caldera. The unvegetated summit is truncated by a dramatic steep-walled, 2 km (1.2 miles) wide caldera that has been the site of frequent historical eruptions. A prehistoric collapse of Gunung Gadung on the W flank produced a large debris avalanche that traveled 79 km (49 miles), reaching nearly to the Indian Ocean. Raung contains several centers constructed along a NE-SW line, with Gunung Suket and Gunung Gadung stratovolcanoes being located to the NE and W, respectively. (GVP)

## **14.6 Langila spews ash to 2.4 km (8 000 feet) in its first explosive eruption since 2018, Papua New Guinea**

**Source:** watchers.news, 3 August, 2020



Papua New Guinea's Langila volcano emitted ash that rose to an altitude of about 2 400 m (8 000 feet) on August 2 and 3, 2020. The last explosive eruption at this volcano took place in 2018.

According to the Darwin VAAC, the plume of ash rose to 2 400 m (8 000 feet) above sea level and drifted northwest at around 07:50 UTC (17:50 LT) on Sunday, August 2.

The volcano showed continuous activity as another eruption occurred at 19:40 UTC (05:40 LT on Monday, August 3).

Langila's last eruptive phase lasted from April 2, 2016 to October 30, 2018 (VEI 2). The volcano has only one known VEI 3 eruption -- in 1954.

### **Geological summary**

Langila, one of the most active volcanoes of New Britain, consists of a group of four small overlapping composite basaltic-andesitic cones on the lower eastern flank of the extinct Talawe volcano.

Talawe is the highest volcano in the Cape Gloucester area of NW New Britain. A rectangular, 2.5-km-long (1.5 miles) crater is breached widely to the SE; Langila volcano was constructed NE of the breached crater of Talawe.

An extensive lava field reaches the coast on the north and NE sides of Langila. Frequent mild-to-moderate explosive eruptions, sometimes accompanied by lava flows, have been recorded since the 19th century from three active craters at the summit of Langila.

The youngest and smallest crater (no. 3 crater) was formed in 1960 and has a diameter of 150 m (492 feet).

## **14.7 Mount Sinabung eruption in Indonesia sends smoke flying 5 km**

**Source:** [downtoearth.org.in](http://downtoearth.org.in), 10 August, 2020

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The Mount Sinabung volcano in Indonesia erupted on August 10, 2020 morning spouting ash at least 5,000 metres high into the sky. No casualty or injuries have been reported so far, according to news agency Associated Press.

The ash destroyed several nearby plantations, according to media reports. Meanwhile, the villagers have been advised to stay five kilometres from the crater's mouth, according to the agency.

Officials, along with local military and police personnel, distributed 1,500 masks and assisted locals in cleaning the volcanic ash. The local fire department despatched five trucks to help with the cleaning, according to Jakarta Post.



“This is an alert for all of us to avoid red-zone areas near Sinabung,” Agence-France Presse (AFP) quoted Armen Putera, a local official with Indonesia's Volcanology and Geological Hazard Mitigation Centre, as saying.



According to some residents, the village went dark for about 20 minutes and was coated with ash in a matter of a few minutes, reported AFP.

Mount Sinabung erupted in 2010 after a 400-year-long hiatus and has been continuously active since September 2013.

In 2016, seven people died after Mount Sinabung erupted, spewing ash about three kilometres into the sky. More than a dozen people were killed when it erupted in 2014.

Activity increased starting around April 2017, with a large ash eruption on August 2, 2017. Additional activity, including ash plumes, were observed over the next several months.

The largest eruption of the year occurred during the last week of December and continued into early 2018.

## **14.8 AVO Downgrades Alert Level At Cleveland Volcano Following Pause In Volcanic Unrest**

**Source:** [kucb.org](http://kucb.org), 3 September, 2020

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Scientists have downgraded the alert level at one of Alaska's most active volcanoes after a sustained pause in volcanic unrest.

This comes after the Alaska Volcano Observatory raised Cleveland Volcano's alert level to "advisory" early in the summer, after a short-lived explosion on the evening of June 1.

According to Aaron Wech, a seismologist with the AVO, Cleveland Volcano usually stays at an elevated color code and alert level. But scientists lowered both the aviation color code and alert level to "unassigned" on Wednesday, since the volcano — which is located on an uninhabited island in the central Aleutians, west of Umnak Island — had gone three months without signs of activity. "Pretty much nothing has happened since that explosion in early June," Wech said. "So it's been a really long pause. We've seen no signs of any surficial activity from satellite data or signs of seismicity. It's just been really quiet."



**Cleveland Volcano (center of photo), on June 3, 2020. Cleveland is a stratovolcano that comprises the entire western half of Chuginadak Island, 25 miles west of Umnak.**

How the AVO approaches the classifications of color code and alert level is complicated. Wech said scientists generally like to have three or more instruments on a volcano to monitor its activity. But Cleveland only has two seismometers on it, which, he said, isn't sufficient to pinpoint the exact location of something like an earthquake, which can cause volcanic unrest.

So, when activity decreases at Cleveland, like it has recently, rather than lowering the alert level from "advisory" to "normal," and the color code from "yellow" to "green," like they would at a more monitored volcano, scientists have to classify it as just "unassigned" in color and code.

"The color code, from our perspective, and how we monitor it, doesn't really change what we're doing," Wech said. "It's just what the public needs to know about the level of activity at the volcano."

When Cleveland erupted in early June, it had gone nearly a year and a half without an eruption, which is the longest time Cleveland has gone without one since 2005. And it seems that similarly now, the volcano is having a quiet period.

According to Wech, this lack of activity is not unusual at the unpredictable volcano. He said Cleveland has a long history of cycles of explosions and inactivity.

Despite the current pause, the eruptive period at Cleveland — dating back to 2001 — remains ongoing and future explosions are likely, he said.

These occur without warning and typically generate small clouds of volcanic ash that are a hazard in the immediate vicinity of the volcano. Though, Wech said, more significant ash emissions are possible.

"This volcano is very tricky because it doesn't have a lot of precursory activity," he said. "So it tends to go from just really quiet to exploding."

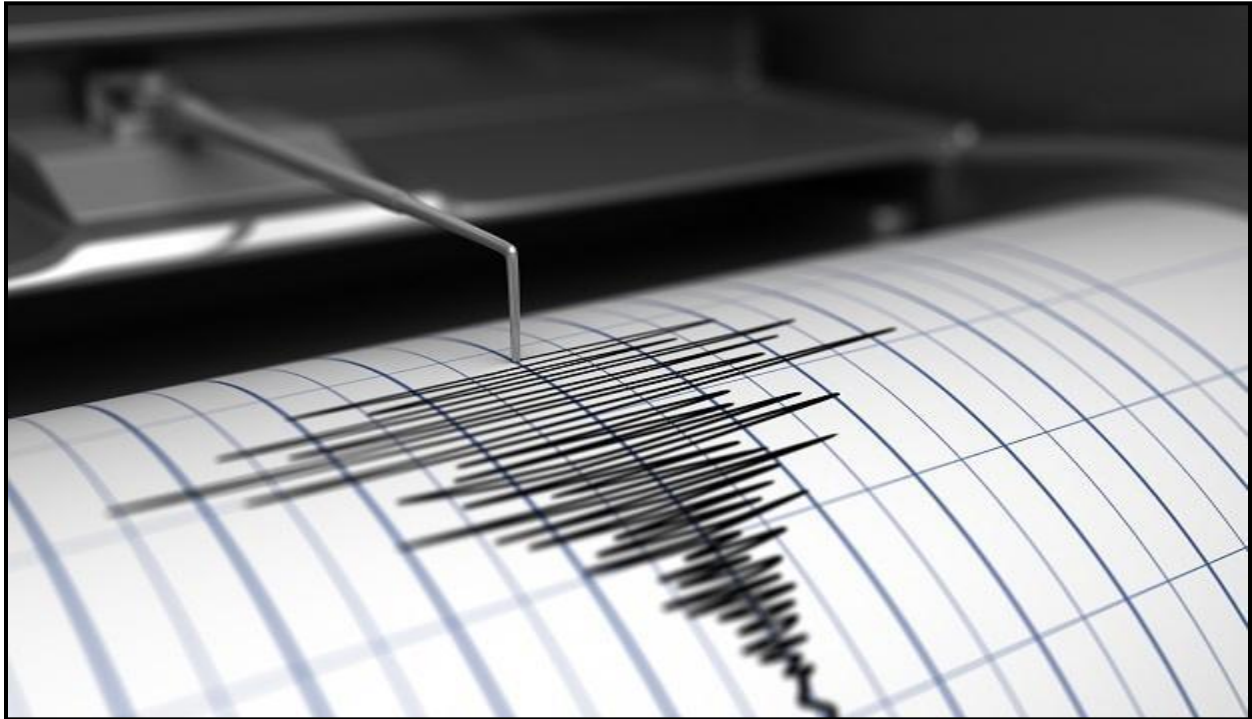
And sometimes we will see some things in satellite data, we can see signs of the summit crater becoming a little bit warmer, which may mean there's some magma intruding up higher into the conduit, but we can definitely have months of pauses or breaks between explosions."

Wech said the AVO will continue to monitor the volcano closely.

## 14.9 Powerful earthquake of 5.7 magnitude strikes off shore of Greece's Crete

**Source:** business-standard.com,19 September,2020

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A 5.7 magnitude earthquake has been registered off the shore of the Greek island of Crete, the European-Mediterranean Seismological Center (EMSC) said.

The tremor was recorded at 16:28 GMT, with the epicentre of the earthquake located 55 kilometres (34 miles) of the city of Heraklion at a depth of 60 kilometres.

No tsunami alert has been declared. There are no reports about any damages or victims caused by the earthquake.

Greece lies in a seismologically active region as the Mediterranean Sea is a border between the African and Eurasian plates. The movement of the African plate to the north - where the Eurasian plate lies - sometimes causes earthquakes and has already resulted in the formation of several mountain ranges in Europe, including the Alps.

The seismic activity in Greece resulted in the so-called Late Bronze Age eruption of the Santorini volcano in the 2nd millennium BC, which triggered huge tsunami waves and caused the decline of the Minoan civilization.

## **14.10 Hundreds evacuated as Indonesia's most active volcano rumbles**

**Source:** [aljazeera.com](https://www.aljazeera.com), 6 November, 2020

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### **Mount Merapi's last major eruption in 2010 killed 347 people and caused the evacuation of 20,000 villagers**

About 500 people evacuated near Mount Merapi after authorities raise the volcano alert to the second-highest level.

Indonesian authorities have evacuated hundreds of people living on the volatile Mount Merapi volcano's fertile slopes on Java island following an increase in volcanic activity.

The head of Yogyakarta's Volcanology and Geological Hazard Mitigation Center, Hanik Humaida, on Friday warned Merapi, Indonesia's most active volcano, could erupt at any time, possibly sending hot gas clouds down its slopes up to five kilometres (three miles).

Edy Susanto, a local disaster mitigation agency official, said about 500 people from four villages, mostly the elderly, pregnant women and children, were taken to emergency shelters in Central Java's Magelang district in Central Java province.



Susanto said emergency measures to evacuate people living within 6km (3.7 miles) of the crater's mouth were being prepared as local administrations in Central Java and Yogyakarta provinces closely monitor the situation.

On Thursday, Indonesia's geological agency raised Merapi's alert level to the second-highest level after sensors picked up increased activity.

The 2,968-metre (9,737-foot) mountain is about 30km (18 miles) from the Yogyakarta city centre. About a quarter-million people live within a 10km (6-mile) radius of the volcano.

Merapi spewed ash and hot gas in a column as high as 6 km (3.7 miles) into the sky in June, but no casualties were reported.

Its last major eruption in 2010 killed 347 people and caused the evacuation of 20,000 villagers.

Indonesia, an archipelago of more than 270 million people, sits on the Pacific "Ring of Fire" and is prone to earthquakes and volcanic eruptions. Government seismologists monitor more than 120 active volcanoes.

### **14.11 Indonesia: Thousands evacuated as volcano erupts**

**Source:** dw.com,30 November,2020



Thousands of Indonesians have been forced to flee as Mount Ili Lewotolok pumps ash and noxious gas into the air. The volcano is one of three to erupt recently, prompting panic among local residents.

Indonesia's Mount Ili Lewotolok erupted on Sunday sending 4 kilometers (2.5 miles) of ash and smoke up into the air and forcing the evacuation of thousands of people, the country's Disaster Mitigation Agency said.

More than 2,700 people were evacuated from 28 villages on the slopes of the volcano, which is located on the eastern island of Lembata in the East Nusa Tenggara province.

Muhammad Ilhan, a 17-year-old who saw the eruption, told Reuters that local residents were "panicked and they're still looking for refuge and in need of money right now."

Despite the panic among locals, there were no reports of deaths or injuries following the eruption.

### **Threat level raised**

The local airport closed as ash continued to fall across parts of the island. The Transportation Ministry also issued a flight warning for the region.

Authorities from the country's Volcanology and Geological Hazard Mitigation Center raised the level of alert in the area from three to four — the second-highest — and recommended the use of masks in order to protect the eyes and skin from the damaging effects of the ash.

They also warned residents to stay 4 kilometers away from the volcanic crater as the area was likely inundated with "hot clouds, lava stream, lava avalanche, and poisonous gas."

### **'Ring of fire'**

The 5,423 meter Mount Ili Lewotolok is the third volcano to erupt in recent months following the Merapi volcano on the island of Java and the Sinabung volcano on Sumatra.

Indonesia has 400 volcanoes across its 17,000 islands. There are 129 active volcanoes, of which some 65 are classified as dangerous.

The archipelago nation lies on the so-called "Ring of Fire" — a series of volcanoes and fault lines along the rim of the Pacific Ocean.

## **14.12 At least 50 explosions in 9 hours at Telica volcano, Nicaragua**

**Source:** [watchers.news](https://www.watchers.news), 2 December, 2020

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At least 50 explosions were recorded within 9 hours on November 30, with a maximum height of ash between 100 and 400 m (330 - 1 300 feet) above the crater. This is about 1.5 km (5 000 feet) above sea level.



**An uptick in activity has been observed at the Nicaraguan Telica volcano on Monday, November 30, 2020, with low-level ash emission and dozens of explosions at regular rates. Ashfall was reported in nearby communities, including El Panal, Cristo Rey, Los Cocos, and Los Ángeles.**

"This activity is part of the normal behavior of an active volcano and it is very likely that similar explosions will occur in the next few days," the Nicaraguan Institute for Territorial Studies (INETER) said.

Volcanic ash emissions ended by 06:34 UTC on Tuesday, December 1, and resumed at around 12:41 UTC on the same day.

At 18:31 UTC, the Washington VAAC reported constant ash emissions, moving SW from the summit.

This activity continued through the rest of the day and into December 2, although no ash was visible early Wednesday due to meteorological cloud cover.

No incandescence was observed on the webcam. However, given the recent activity level, volcanic ash emission is certainly possible, Washington VAAC noted in their advisory issued 05:39 UTC today.

Three explosions were reported at the volcano on October 29, INETER reported. The events ejected rock fragments onto the flanks and produced gas-and-ash plumes that rose as high as 1 km (3 300 feet) above the crater rim and drifted W.

Ashfall was reported in areas downwind including the communities of El Bosque, Jacinto Baca (15 km / 9.3 miles WSW), Filiberto Morales (15 km / 9.3 miles WSW), Carlos Huete, Linda Vista, and Divino Niño (31 km / 19 miles W). Three explosions on October 30 and 31 produced gas-and-ash plumes that rose 250 - 600 m (820 to 1 970 feet) above the rim. A minor amount of ash fell on the flanks.

## **Geological summary**

Telica, one of Nicaragua's most active volcanoes, has erupted frequently since the beginning of the Spanish era. This volcano group consists of several interlocking cones and vents with a general NW alignment.

Sixteenth-century eruptions were reported at symmetrical Santa Clara volcano at the SW end of the group.

However, its eroded and breached crater has been covered by forests throughout historical time, and these eruptions may have originated from Telica, whose upper slopes in contrast are unvegetated.

The steep-sided cone of 1061-m-high (3 480 feet) Telica is truncated by a 700-m-wide (2 296 feet) double crater; the southern crater, the source of recent eruptions, is 120 m (393 feet) deep. El Liston, immediately SE of Telica, has several nested craters.

The fumaroles and boiling mudpots of Hervideros de San Jacinto, SE of Telica, form a prominent geothermal area frequented by tourists, and geothermal exploration has occurred nearby. (GVP)

## **15. Sand or Dust Storms/Thunderstorms**

### **15.1 Huge dust storms in Australia hit central New South Wales**

**Source:** theguardian.com,19 January,2020

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Damaging winds produced by thunderstorms across central New South Wales have whipped up dust storms that turned daytime into night in some towns.

The Bureau of Meteorology issued a series of severe thunderstorm warnings on Sunday evening for inland NSW with the associated winds generating massive dust clouds.

Videos posted to social media showed dust storms descending on Dubbo and nearby towns that were so thick they blocked out the sun.

A gust of 94 km/h was recorded at Parkes about 6.30pm while a gust of 107 km/h was recorded at Dubbo about 7.45pm, the bureau said.



A bureau meteorologist, Rose Barr, said Sunday's significant rain was concentrated across central and northern parts of the state on, and east, of the ranges.

Rain and hail also lashed Victoria, sparking almost 1500 calls for assistance with more severe weather on the way as bushfires continue. The State Emergency Service received 1453 calls for assistance since Sunday morning, more than 1000 of them for building damage.

Many towns on the NSW mid-north coast and the northern rivers regions received between 100mm and 180mm from 9am to 10.30pm on Sunday.

In the southern part of the state, high winds saw storms race overhead quickly, resulting in lower measured falls.

Downpours over the past few days have provided relief for parts of drought-stricken NSW and helped firefighters slow the spread of bushfires and build containment lines before increased fire danger mid-week.

In Victoria, rain fell hardest in East Gippsland, with 56.6mm falling at Mount Elizabeth and 55mm at Mount Wellington.

In Melbourne, the northeast and inner east were hit with severe thunderstorms, including giant hail. Most areas copped between 10 and 15mm of rain, while Doncaster received 27mm.

The thunderstorms will continue on Monday. "Tomorrow we have a very active thunderstorm day forecast, particularly across south-eastern and central-eastern parts of [NSW], as well as parts of the south-west slopes," Barr said.



But again they were likely to move quickly with some “extremely strong wind gusts”. There could also be large hailstones.

There are 14 bushfires still burning in Victoria, mostly at an advice level.

An emergency warning was issued on Sunday evening for a bushfire in central Victoria threatening lives and homes in Pastoria, but it was downgraded to a “watch and act” early on Monday.

As the effort to put out the remaining fires continues, a severe weather warning is in place for central and eastern parts of the state, including fire-ravaged East Gippsland. Widespread falls of between 10 and 30mm are expected, but some areas could see isolated totals of up to 80mm or 100mm.

The wet conditions could lead to flash flooding in some areas, but the weather bureau says rainfall is unlikely to put out remaining blazes. The weather comes as up to 70 people are preparing to return to Mallacoota on Monday, where bushfires had trapped thousands on the beach.

Victorian emergency services minister Lisa Neville says people who were reuniting with family members that stayed in the stranded East Gippsland coastal town were the priority.

“300 people want to fly back in and that’ll be our first priority and we’re looking at around 70 people to fly back in (Monday),” Neville said.

Winds will shift and come more from the north and west midweek, bringing drier and warmer air on Wednesday and Thursday.

“That means on both of those days we may end up seeing fire dangers increasing again and causing more problems for our fire agencies,” Barr said. But moisture will return on Friday and the weekend.

## **15.2 Sandstorm Wreaks Havoc in Canary Islands**

**Source:** nytimes.com, 24 February, 2020

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Red sands carried by winds from the Sahara have forced airports to close, leaving thousands stranded.

MADRID — Winds from the Sahara continued to send streams of sand drifting over the Canary Islands on Monday, creating chaos as the swirling sands forced planes to be grounded, disrupted traffic and exacerbated wildfires.



**A beach on Gran Canaria on Saturday**

Ángel Víctor Torres, the regional president of the islands, a Spanish archipelago, told Spanish national television that it was the worst such storm to hit the islands in 40 years. He described its arrival as “a nightmare weekend.”

He said on Monday that the situation remained worrying on at least four islands, including Gran Canaria, which faces the greatest threat of wildfires.

The Spanish airport operator, Aena, reopened the archipelago’s airports on Monday, although it said that traffic would resume gradually and advised passengers to check with the airlines before heading to the airport. All of the islands’ airports were shut on Saturday because of strong winds and low visibility, leaving thousands of tourists stranded.

Primary schools remained closed on Monday, with the authorities also advising residents to keep their windows shut and stay indoors, particularly people with respiratory problems.

The weather phenomenon, known as a calima, occurs when a burst of dusty, warm wind forms during sand storms in the Sahara and then crosses over from the African desert. The Canary Islands are in the Atlantic off the western coast of Morocco.

The weekend arrival of the calima brought wind speeds of more than 80 miles per hour to many parts of the archipelago and shrouded cars and buildings in red sand dust. In the smaller island of La Palma, fierce winds tore down lamp posts, palm trees and a wall along a main road, burying parked cars in debris. The sandstorm reduced visibility so heavily in some places that many roads were closed, and drivers who did venture out crawled nearly to a halt as they struggled to see.

Manuel Campos, a 71-year-old entrepreneur who lives in Las Palmas, the capital of Gran Canaria, said by telephone that he had canceled a planned weekend beach outing and stayed in his house, in line with the authorities' recommendation to avoid being outdoors.

"I'm old enough to know all about the calima, but I don't recall it that strong," he said. "Everything just turned red." In the archipelago's main towns, those who braved the winds and took to the streets mostly shielded their faces with masks or neckerchiefs to avoid inhaling the red dust particles.

The dust resulted in Gran Canaria having the worst air quality in the world over the weekend, according to local news reports, with about 40 times the density of particles considered safe by the World Health Organization.



**At the airport in Santa Cruz de Tenerife on Sunday**

The strong winds also fueled the spread of wildfires on the islands of Tenerife and Gran Canaria, with one blaze consuming a banana plantation on La Palma. On Gran Canaria, a fire destroyed hundreds of acres of land over the weekend and forced the evacuation of hundreds of people.

With pilots unable to fly aircraft to assist firefighters on the ground, the fire continued to burn, threatening to spread further into the Inagua nature reserve. One helicopter was able to briefly join the firefighting efforts on Monday. If wind conditions improve, the Spanish authorities hope to deploy further helicopters and two firefighting aircraft on Tuesday.

The Canary archipelago is one of Spain's main tourist destinations, particularly in the winter months, when it attracts sun seekers from colder parts of Europe.

The weekend airport closings brought chaos for holiday makers trying to leave or reach the islands, particularly for thousands of British families as it coincided with a British school holiday.

On Sunday, 745 flights were canceled and an additional 84 were diverted to other airports, according to the Spanish airport operator. Many people spent the night in the airport because nearby hotels were fully booked in the midst of the carnival holiday season. One of Spain's main airlines, Vueling, offered to reimburse passengers who found their own accommodations.

While some tourists told British news outlets that they had faced surreal weather in the Canary Islands, comparing it to an apocalypse, locals said it was not a major natural disaster. "There's less visibility on the street, but nothing that stops normal life," said Santiago Ceballos, a resident of Gran Canaria.

Canary islanders are familiar with the orange hue provoked by a calima, but it is rarely felt with such intensity.

Local newspapers compared the weekend chaos to that of January 2002, when another calima also forced the temporary closing of the airports. The latest Saharan winds also disrupted the preparations of carnival festivities, one of the highlights of the year on the islands.

Several early events were canceled and some outdoor structures were temporarily dismantled, though organizers said they were confident that the main street parades would take place as scheduled this week.

With rain forecast in the coming days on the islands, Spain's weather agency said that red rain, in the form of downpours filled with red dust, could help put out the fires and remove the dust from the air.

### 15.3 'Apocalyptic' sand storm engulfs Niger's capital city

Source: 9news.com.au, 7 May, 2020

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**In this photo taken Monday, May 4, 2020, a dust cloud rolls over the capital Niamey, Niger**

Footage has shown what many have called an 'apocalyptic' wall of dust and sand engulf Niger's capital city, Niamey, in West Africa. The dust storm enveloped streets and buildings





across the entire city, turning night into day and the giving the sky a 'blood red' tint.

Dust The dust storm enveloped streets and buildings across the entire city, turning night into day and the giving the sky a 'blood red' tint.

Dust storms are common in the region during the dry season, but the city has not seen such enormous plumes of sand and dust - in some areas reaching over hundreds of metres high - like these for some time.



**Dust fills a street after a dust cloud swept over the capital Niamey, Niger**

Drylands across the African continent see airborne dust turn into storms such as the one seen in Niger, and less than a year ago, a dust storm in southern Africa was even picked up by NASA satellites.

As the dust storm accosted the city, residents reported that the wind whipped up incredibly quickly, carrying the sand across the city to the Atlantic Ocean.

The South African Weather Service reported that the winds brought up enough particles into the air to produce 'moderate to poor visibility', explaining why the light of day had turned to a deep red.

## 15.4 NASA Observes Large Saharan Dust Plume Over Atlantic Ocean

Source: nasa.gov, 19 June, 2020

NASA-NOAA's Suomi NPP satellite observed a huge Saharan dust plume streaming over the North Atlantic Ocean, beginning on June 13. Satellite data showed the dust had spread over 2,000 miles.

At NASA's Goddard Space Flight Center in Greenbelt, Maryland, Colin Seftor, an atmospheric scientist, created an animation of the dust and aerosols from the plume using data from instruments that fly aboard the Suomi NPP satellite.



**On June 18, 2020, NASA-NOAA's Suomi NPP satellite captured this visible image of the large light brown plume of Saharan dust over the North Atlantic Ocean. The image showed that the dust from Africa's west coast extended almost to the Lesser Antilles in the western North Atlantic Ocean.**

"The animation runs from June 13 to 18 and shows a massive Saharan dust cloud that formed from strong atmospheric updrafts that was then picked up by the prevailing westward winds and is now being blown across the Atlantic and, eventually over North and South America," Seftor said. "The dust is being detected by the aerosol index measurements from the Suomi-NPP Suomi NPP satellite's Ozone Mapping and Profiler Suite (OMPS) data overlaid over visible imagery from the Visible Infrared Imaging Radiometer Suite (VIIRS)."

On June 18, 2020, the VIIRS instrument aboard NASA-NOAA's Suomi NPP satellite captured a visible image of the large light brown plume of Saharan dust over the North Atlantic

Ocean. The image showed that the dust from Africa's west coast extended almost to the Lesser Antilles in the eastern North Atlantic Ocean. The image showed that the dust had spread over 2,000 miles across the Atlantic.

Normally, hundreds of millions of tons of dust are picked up from the deserts of Africa and blown across the Atlantic Ocean each year. That dust helps build beaches in the Caribbean and fertilizes soils in the Amazon. It can also affect air quality in North and South America.

NASA continues to study the role of African dust in tropical cyclone formation. In 2013, one of the purposes of NASA's HS3 field mission addressed the controversial role of the hot, dry and dusty Saharan Air Layer in tropical storm formation and intensification and the extent to which deep convection in the inner-core region of storms is a key driver of intensity change.

Suomi NPP represents a critical first step in building the next-generation Earth-observing satellite system that will collect data on long-term climate change and short-term weather conditions. NPP is the result of a partnership between NASA, the National Oceanic and Atmospheric Administration, and the Department of Defense.

For more than five decades, NASA has used the vantage point of space to understand and explore our home planet, improve lives and safeguard our future. NASA brings together technology, science, and unique global Earth observations to provide societal benefits and strengthen our nation.

Advancing knowledge of our home planet contributes directly to America's leadership in space and scientific exploration.

## **15.5 'Godzilla dust cloud' travels 5,000 miles from Sahara to US, engulfs Florida, Texas**

**Source:** [hindustantimes.com](http://hindustantimes.com), 28 June, 2020

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The current dust storm is expected to hang over the region until the middle of next week, deteriorating the air quality in Texas, Florida and other states. A massive dust storm from the Sahara desert engulfed parts of the mainland United States on Saturday, travelling over a distance of 5,000 miles.

A massive dust storm from the Sahara desert engulfed parts of the mainland United States on Saturday, travelling over a distance of 5,000 miles.



### **The movement of the expansive dust storm**

NASA, which is tracking the plume of dust, said that such storms travelling across the Atlantic Ocean are nothing new but the one has been quite expansive.

The 3,500-mile-long cloud was dubbed the “Godzilla dust cloud” by climatologists.

An animation of various images gathered by NASA satellite shows the dust plume streamed from Africa’s west coast over the Atlantic into the Caribbean Sea and up through the Gulf of Mexico.

“It’s a really dry layer of air that contains these very fine dust particulates. It occurs every summer,” said National Weather Service (NWS) meteorologist Patrick Blood.

This year, the dust is the most dense it has been in a half a century, news agency Reuters reported quoting several meteorologists.

The current dust storm is expected to hang over the region until the middle of next week, deteriorating the air quality in Texas, Florida and other states where the number of Covid-19 cases has recently spiked.

“There’s emerging evidence of potential interactions between air pollution and the risk of Covid, so at this stage we are concerned,” said Gregory Wellenius, a professor of environmental health at Boston University’s School of Public Health.

Air pollution can be especially detrimental for people who are at risk for or suffer from cardiovascular and respiratory illnesses, Wellenius added. Heart and lung problems



heighten the risk of severe Covid-19. The plume created hazy skies and lower visibility, according to the pictures shared by many residents of FLorida, Texas and other US States.

On June 18, NASA noted the thickest parts of the dust storm appeared to stretch about 1,500 miles across the Atlantic Ocean. By June 24, the plume extended over 5,000 miles.

### **15.6 Yellow dust from China could spread Covid-19: North Korea warns people to stay inside**

**Source:** ptcnews.tv, 24 october,2020

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North Korea warned its citizens to remain indoors over fears that yellow dust from China could carry COVID-19 with it.



As per the report, the Yellow dust refers to a sand from Mongolian and Chinese deserts that blows into the Korean Peninsula and the parts of Japan.

Reportedly, the dust carries industrial pollutants, viruses, fungi, bacteria, and heavy metals, that may lead to respiratory issues.

North Korea's official party newspaper Rodong Sinmun, on Thursday, said that as COVID-19 infections continue to spread across the world, it has become more crucial to deal with the yellow dust and take precautionary measures.



The North Korean newspaper also stated that the citizens should refrain from outdoor activities and must wear masks while going outside.

North Korea is the only country that has reported no confirmed cases of the COVID-19, a claim that is questioned by the health experts.

The country has imposed strict border controls and quarantine measures to prevent the spread of novel virus. According to the analysts, the outbreak could be devastating for economically and politically isolated country.

On Thursday, the Russian embassy in North Korea wrote on Facebook that North Korea had ordered all the visitors to the country and its staff to wait out the dust storm inside.

## **16. Locust Attack**

### **16.1 East Africa is suffering its worst invasion of desert locusts in 25 years**

**Source:** [edition.cnn.com](https://edition.cnn.com), 25 January, 2020

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**Nairobi (CNN):** The Horn of Africa has been hit by the worst invasion of desert locusts in 25 years, the UN's Food and Agriculture Organization (FAO) said Friday.

The invasion poses an unprecedented threat to food security in the entire sub region, where more than 19 million people in East Africa are already experiencing a high degree of food insecurity, the agency said.

In Kenya, it is the worst invasion in 70 years, and the government is spending \$5 million to manage the swarms of locust and prevent spreading.

Invasions of desert locusts are irregular in the region, the last instance occurred in 2007 at a much smaller scale.

"This current invasion of desert locust is significantly larger in magnitude and scale than previously experienced in Kenya and across East Africa," said Dr. Stephen Njoka, the Director General of Desert Locust Control Organization.

Irregular weather and climate conditions in 2019, including heavy rains between October and December, are suspected to have contributed to the spread of locusts in the region.

A cyclone that swept through northeastern Somalia and eastern Ethiopia in December, bringing heavy rains to the area, created ideal conditions for the insects to breed for the next six months, said Keith Cressman, FAO's senior locust forecasting officer.

Large swarm areas of northeastern Somalia and eastern Ethiopia are not being detected or treated, leaving the area vulnerable to new generations of locusts.

If locusts are left untreated by control measures, swarms can potentially grow 400 times larger by June, Cressman said.

Unexpected and unpredictable rainfall in northern Kenya that carried into January also continues to enable favorable breeding ground. As large swarms continue to move into Kenya and multiply, "you have a recipe for the situation to deteriorate further," said Cressman.

"Under a worst-case scenario," the invasion could become a plague if it is not contained quickly, the FAO said in a statement.

### **Emergency action plan**



**A man walks through a locust swarm in Kenya on 22 January 2020, Samburu County, Ololokwe, Kenya.**

The locusts have already devastated large swaths of food and pasture in the region, but the extent of the damage cannot yet be determined since new swarms are spreading across

borders everyday, said Njoka. While Njoka remains positive the pesticides are working, the rapid and constant movement of the locusts makes it difficult to assess just how effective it has been.

The FAO has escalated the situation to the highest disaster level, leading the agency to put in place a six month emergency action plan and suggest it will take USD \$70m to contain the swarms across the region.

The desert locust is the most destructive of all food-eating locust species because of its speed and ability to multiply rapidly. According to the FAO, the insects do not attack people or animals and there is no evidence they carry diseases that can harm humans. Desert locusts swarms can stay in the air for very long periods of time, traveling up 130 kilometers (80 miles) or more a day, the FAO said.

A swarm can vary from one square kilometer to several hundred square kilometers with up to 80 million adult locusts in each square kilometer of a swarm. A swarm the size of Paris can devour as much food as half the population of France, according to the FAO.

## **16.2 After East Africa locust attack threatens South Asia**

**Source:** [dailysabah.com](http://dailysabah.com), 20 February, 2020



Nibbling their way across a large part of Africa in the worst outbreak, locust swarms are now threatening South Asian countries with India taking extra measures to ward off a new outbreak that could ravage crops.

India is buying drones and specialist equipment to monitor the movement of locusts and spray insecticides.

Earlier this year, Indian authorities were able to bring swarms of desert locusts under control, but an outbreak in neighboring Pakistan has again raised concerns about the safety of crops such as wheat and oilseeds in India.

Pakistan has declared a national emergency to battle the swarms of desert locusts which are eating crops on a large scale and raising fears of food insecurity.

Villages in India's western states of Gujarat and Rajasthan states, which share a border with Pakistan's desert areas, are especially susceptible to the locust invasion.

Locust swarms can fly up to 150 kilometers a day with the wind, and adult insects can consume roughly their own weight in fresh food per day. A small swarm eats as much in one day as about 35,000 people.

The plague has already caused extensive damage to pastures and crops and threatened food security in several countries over the Indian Ocean in East Africa, including Somalia, Ethiopia, Kenya Eritrea and Djibouti.

Swarms have also spread into Tanzania, Uganda and now South Sudan. Officials have warned that the outbreak, could lead to famine in Africa already struggling with food insecurity.

### **16.3 Plague-Like Locust Swarms Sweep Saudia Arabia, East Africa, Asia**

**Source:** interestingengineering.com,13 March,2020

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Swarms of locusts are sweeping through Saudia Arabia, East Africa, and Asia, and they may be about to breed.

Locusts are swarming across East Africa, Asia, and the Middle East, threatening local food supplies and basic livelihood, reports the journal Nature.

At least 20 million people are in danger as scientists and governments rush to bring the insects under control.





### **Locust swarms sweep the 'cradle of civilization'**

The outbreak today coincides with cyclones in 2018, and the warm weather at the end of 2019, compounded by unseasonably heavy rains. Scientists detected vast swarms at the beginning of 2020 in Somalia and Ethiopia, and afterward they insects spread wild across countries like Kenya — where they've been a constant plague-like presence for 70 years — Sudan and Uganda. Swarms were also detected in Saudi Arabia, Iran, Pakistan, and India.

Previously, Kenya saw an incredibly large swarm occupy an area of 2,400 square kilometers (926 square miles), more than three times the size of New York City. A swarm of locusts typically occupies 100 square kilometers, but even at this smaller size, between 4 and 8 billion locusts are flying and buzzing around inside, collectively capable of eating the equivalent of what 3.5 million people can eat in a single day.

The swarm could even spread as far north as Turkey, according to the country's Head of Chamber of Agricultural Engineers, Özden Güngör.

The United Nations' Food and Agriculture Organization (FAO) has appealed for US\$138 million in immediate funding.

Meanwhile, researchers have stressed the need for better monitoring to predict insect movement and growth, adding that alternatives to synthetic chemical pesticides are necessary to attack locust populations before they breed into an even larger swarm.



## **Locust population explodes**

The desert locust — also known by its scientific name, *Schistocerca gregaria* — is found in more than 65 of the world's countries, and doesn't normally join into large swarms in the deserts that stretch from West Africa to India. Locusts breed following periods of rainfall, when soil is moist — ideal for locusts to lay eggs.

But when it pours rain, locust populations build up incredibly fast, into vast, maddening swarms.

## **Additional swarm factors**

There are of course other factors in play, said Director-General Segenet Kelemu of the International Centre of Insect Physiology and Ecology in Nairobi, which has advised the Kenyan government on control measures.

For example, continuing war and violence in the region has made much of Yemen inaccessible to research workers and humanitarians, slowing the world's ability to combat outbreaks.

"Swarms also develop when control efforts break down or political or natural disasters prevent access to breeding areas, and interventions do not start early enough," Kelemu said, to Nature.

"Countries like Yemen, where there are human catastrophic situations due to conflict, are in no position to take care of invasive pests."

## **16.4 Pakistan locust situation worsens as swarms enter via Afghanistan**

**Source:** [newindianexpress.com](http://newindianexpress.com), 12 June, 2020

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Minister for National Food Security and Research Syed Fakhr Imam said the government was keeping a vigil on the movement of swarms of desert locusts.

ISLAMABAD: The desert locust situation in Pakistan was fast deteriorating and swarms have found a new corridor from Afghanistan to attack agricultural fields in Khyber Pakhtunkhwa, it was reported on Friday.

Crop loss have been reported in several areas of Khyber Pakhtunkhwa, particularly in Dera Ismail Khan district, from where these locust swarms were entering Punjab thereby posing a serious threat to the food basket of the country, said the Dawn news report.



### **Locusts swarm above a mango tree orchard**

Winding up the debate on locusts in the National Assembly on Thursday, Minister for National Food Security and Research Syed Fakhr Imam said the government was keeping a vigil on the movement of swarms of desert locusts entering Pakistan from four countries: Ethiopia, Somalia, Eritrea and Djibouti via Saudi Arabia, Yemen and Iran.

He said that new swarms of desert locusts would enter Balochistan from Iran over the next two weeks, adding that the province was already the worst-hit with its 33 districts already invaded by insects.

In Balochistan, he said, ground operation against locusts had been carried out over 85,000 hectares by ground teams and aerial sprays had been carried out over 500 hectares.

The Minister added that the federal government was in close coordination with the Food and Agriculture Organisation (FAO) which was keeping Pakistan informed on a daily basis on the movement of locust swarms in the region.

## 17. Covid 19

### 17.1 Coronavirus outbreak 'just beginning' outside China, says expert

**Source:** reuters.com,12 February,2020

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SINGAPORE (Reuters) - The coronavirus epidemic may be peaking in China where it was first detected in the central city of Wuhan but it is just beginning in the rest of the world and likely to spread, a global expert on infectious diseases said on Wednesday.

The Chinese government's senior medical adviser has said the disease is hitting a peak in China and may be over by April. He said he was basing the forecast on mathematical modelling, recent events and government action.

Dale Fisher, chair of the Global Outbreak Alert & Response Network that is coordinated by the World Health Organization, said that predicted "time course" may well be true if the virus is allowed to run free in Wuhan.

"It's fair to say that's really what we are seeing," he told Reuters in an interview. "But it has spread to other places where it's the beginning of the outbreak. In Singapore, we are at the beginning of the outbreak."

The flu-like virus has killed more than 1,100 people and infected nearly 45,000, predominantly in China and mostly in Wuhan.

Singapore has reported 50 coronavirus cases, one of the highest tallies outside China, including mounting evidence of local transmission.

"I'd be pretty confident though that eventually every country will have a case," Fisher said.

Asked why there were so many cases in Singapore, he said there were comparatively more tests being conducted on the island.

"We have a very low index of suspicion for testing people so...we do have higher ascertainment," he said, but added that there was a lot about transmission of the virus yet to be understood.

Kenneth Mak, director of medical services at Singapore's health ministry, told a news conference it was difficult to be confident in projections that the epidemic will peak in China this month but, in any case, peaks in other countries will lag China by one or two months.

Fisher said there was no justification for the kind of panic buying of essentials like rice and toilet rolls seen in Singapore.

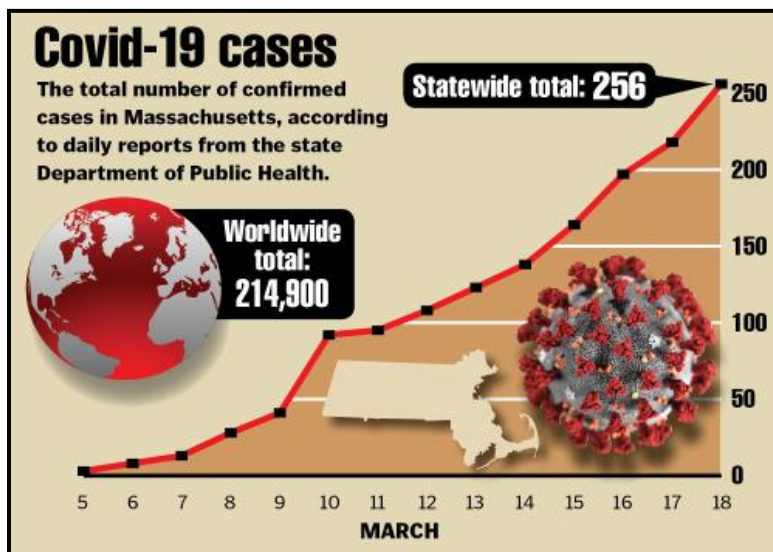
“There’s no suggestion we are going to run out of anything,” he said. “I would just stay level-headed.”

He said the elderly and those with diabetes were most at risk of serious illness.

“For the vast majority of people it will just be a mild illness but still treat it with respect,” Fisher said.

## 17.2 Coronavirus by the numbers in Massachusetts, U.S. and the world

Source: bostonherald.com, 18 March, 2020



### Coronavirus by the numbers in Massachusetts, U.S. and the world

More than 200,000 cases around the world. The total number of confirmed coronavirus cases in Massachusetts topped 250 on Wednesday as the total around the U.S. approached 8,000 — and the world figure eclipsed 200,000.

Thirty-eight new coronavirus cases were confirmed in Massachusetts from the previous day, bringing the Bay State’s total to 256 confirmed cases, according to a state Department of Public Health update on

Wednesday. In comparison, the number of confirmed cases 10 days ago in Massachusetts was 28.

Of the 256 confirmed cases in the Bay State, 97 cases are tied to the Biogen employee conference in Boston’s downtown waterfront in late February.

Of the remaining cases, 38 are tied to local transmission, 26 are travel-related, and 95 are under investigation.

Middlesex County has the most confirmed cases with 100. Suffolk County has 51 confirmed cases, and Norfolk County has 45 confirmed cases.

Among the Massachusetts cases is a House of Representatives' staff member, Speaker Robert DeLeo confirmed on Wednesday.

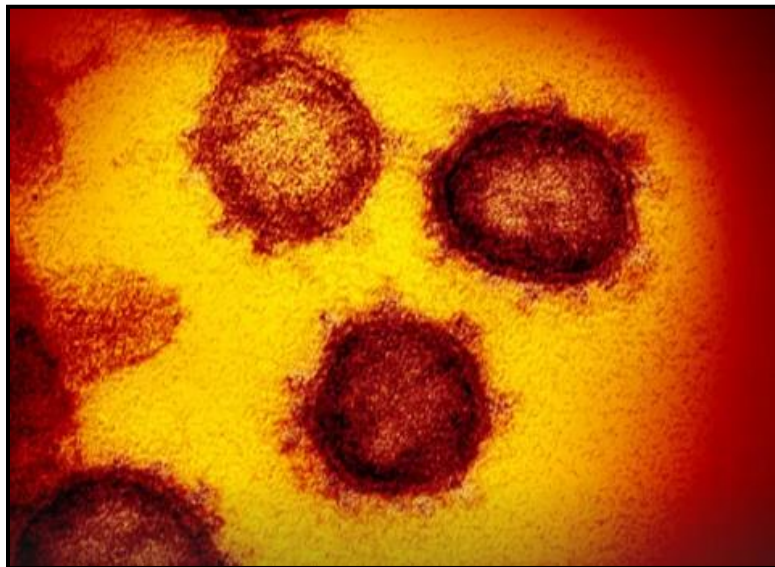
There are now cases in all 50 states, with the total at 7,769 cases. The most confirmed cases are in New York with 2,382 cases; Washington state with 1,012 cases; California with 611 cases; New Jersey with 427 cases; and Florida with 314 cases.

Those states also have the most coronavirus deaths — 55 deaths in Washington state; 16 deaths in New York; 13 deaths in California; seven deaths in Florida; and five deaths in New Jersey. A total of 118 people have died in the U.S. from coronavirus.

Worldwide, there are now 214,900 confirmed cases and 8,700 deaths. The most cases and deaths are in China, Italy, Iran and Spain.

### **17.3 What is Covid-19?**

**Source:** theguardian.com ,25 March,2020



The new coronavirus has affected more than 425,000 people across the globe, causing more than 18,000 fatalities.

The new coronavirus, now known as Covid-19, was first encountered in November 2019, and has gone on to affect over 425,000 people in over 150 countries around the globe, causing more than 18,000 deaths.

The virus can cause pneumonia-like symptoms. Those who have fallen ill are reported to suffer coughs, fever and breathing difficulties. In severe cases there can be organ failure. As this is viral pneumonia, antibiotics are of no use. The antiviral drugs we have against flu will not work. If people are admitted to hospital, they may get support for their lungs and



other organs, as well as fluids. Recovery will depend on the strength of their immune system. Many of those who have died were vulnerable because of existing underlying health conditions.

The name Covid-19 was announced on 11 February by the World Health Organization. The director general, Tedros Adhanom Ghebreyesus, said: "We had to find a name that did not refer to a geographical location, an animal, an individual or group of people, and which is also pronounceable and related to the disease.

Having a name matters to prevent the use of other names that can be inaccurate or stigmatising."

We don't yet know how dangerous Covid-19 is, and we won't know until more data comes in. The mortality rate seems to be around 2%. For comparison, seasonal flu typically has a mortality rate below 1% and is thought to cause about 400,000 deaths each year globally. Sars had a death rate of more than 10%.

Another key unknown, of which scientists should get a clearer idea in the coming months, is how contagious Covid-19 is. A crucial difference is that unlike flu, there is no vaccine for the new coronavirus, which means it is more difficult for vulnerable members of the population – elderly people or those with existing respiratory or immune problems – to protect themselves.

Hand-washing and avoiding other people if you feel unwell are important. One sensible step is to get the flu vaccine, which will reduce the burden on health services if the outbreak turns into a wider epidemic.

Like other coronaviruses, it originated in animals and then migrated to humans. In this case it appears to have originated in the city of Wuhan in China.

Many of those initially infected either worked or frequently shopped in the Huanan seafood wholesale market in the centre of the city, which also sold live and newly slaughtered animals. China's national health commission confirmed human-to-human transmission of the virus in January.

New and troubling viruses usually originate in animal hosts. Ebola and flu are other examples, and severe acute respiratory syndrome (Sars) and Middle Eastern respiratory syndrome (Mers) are both caused by coronaviruses that came from animals.

In 2002, Sars spread virtually unchecked to 37 countries, causing global panic, infecting more than 8,000 people and killing more than 750. Mers appears to be less easily passed from human to human, but has greater lethality, killing 35% of about 2,500 people who have been infected.

## 17.4 COVID-19 Daily Update: April 8, 2020

Source: spglobal.com, 8 April, 2020

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After 11 weeks of lockdown, Chinese authorities lifted restrictions on the city of Wuhan's 11 million people today. Austria, the Czech Republic, Denmark, and Norway plan to loosen crisis-related guidelines on their populations in coming weeks. These countries were some of the first to implement anti-coronavirus measures on movement—while many sovereigns, including Thailand and Russia, instituted nationwide stay-at-home orders last week. Today, the European Commission recommended its 30 countries keep their external borders (except for essential traffic) closed until May 15.

"Now is not the time to relax measures," the World Health Organization's director for Europe, Hans Kluge, said today. "It is the time to once again double and triple our collective efforts to drive toward suppression with the whole support of society."

"When we have the curve under control, we will shift toward a new normality and toward the reconstruction of our economy," Spanish Prime Minister Pedro Sanchez said.

"It's like walking a tightrope," Danish Prime Minister Mette Frederiksen said. "If we stand still, we may fall. If we go too fast, it may soon go wrong. We don't know when we'll be on firm ground again."

U.S. President Donald Trump asserted on Twitter that the United States will reduce restrictions "sooner rather than later."

"If 'back to normal' means acting like there never was a coronavirus problem, I don't think that's going to happen until we do have a situation where you can completely protect the population," said Dr. Anthony Fauci, the U.S.'s top coronavirus expert and director of the National Institute of Allergy and Infectious Diseases. "But when we say getting back to normal, we mean something very different from what we're going through right now. Because right now, we're in a very intense mitigation."

"Please don't politicize this virus," W.H.O. Director-General Tedros Adhanom Ghebreyesus said, addressing President Trump's criticisms on the premier health organization's handling of the crisis. "If you want to be exploited and you want to have many more body bags, then you do it. If you don't want many more body bags, then you refrain from politicizing it."

In a report sent to the Trump Administration, the National Academy of Sciences warned that the coronavirus may not diminish in summertime with warmer weather, confounding

hopes for this crisis to wane at the turn of the season. “There is some evidence to suggest that SARS-CoV-2 may transmit less efficiently in environments with high ambient temperature and humidity; however, given the lack of host immunity global, this reduction in transmission efficiency may not lead to a significant reduction in disease spread without the concomitant adoption of major public health interventions ... The other coronaviruses causing potentially serious human illnesses, including both SARS-CoV and MERS-CoV, have not demonstrated any evidence of seasonality following their emergence,” the report said. “Given that countries currently in ‘summer’ climates, such as Australia and Iran, are experiencing rapid virus spread, a decrease in cases with increases in humidity and temperature elsewhere should not be assumed.”

As countries take further measures to protect their populations and economies, the effects on businesses and markets remain negative. The global surge in COVID-19 cases, pressures of the global recession, and overall weaker capital market conditions are weighing on corporate credit quality. The pandemic's erosion of global GDP growth has hit emerging markets especially hard.

The economic shock could increase credits costs for Chinese banks by nearly \$224 billion in 2020, according to S&P Global Ratings.

S&P Global Ratings also expects credit conditions in Latin America to worsen as the pandemic advances in the region.

Because of the correlation of most infrastructure assets with the economy, their regulated nature, and the measures imposed so far by several governments to contain the pandemic that have hampered cash flow generation, S&P Global Ratings expects this sector to remain highly vulnerable in the short- to medium-term. Downside risks are still significant.

Japan is estimated to lose out on about \$5 billion of inbound and domestic consumption this year as a result of the postponement of the Olympic Games. The nation, which for months had low infection rates, is now under a state of emergency due to a recent spike in cases.

As the U.S. Federal Reserve began taking extensive action to limit the economic implications of the coronavirus in the U.S., all central bankers “viewed the near-term U.S. economic outlook as having deteriorated sharply in recent weeks and as having become profoundly uncertain. Many participants had repeatedly downgraded their outlook of late in response to the rapidly evolving situation.

All saw U.S. economic activity as likely to decline in the coming quarter and viewed downside risks to the economic outlook as having increased significantly,” according to minutes of the policy-making Federal Open Market Committee’s March 15 meeting.

Now, the Fed is fielding calls from Congress and energy regulators to give electric, gas, and water utilities easier access to short-term loans amid commitments to suspend customer disconnects due to the pandemic, according to S&P Global Market Intelligence.

The 23-country OPEC+ alliance is aiming for a global oil-output cut of 10 million-15 million barrels a day, including producers outside the group, when ministers meet Thursday for a critical summit to shore up the coronavirus-stricken market, Kuwaiti oil minister Khaled al-Fadhel told S&P Global Platts.

Many details remain in flux, but all OPEC+ members are committed to clinching a deal, Mr. Fadhel said.

Saudi Arabia's attempt to negotiate a global pact with Russia to rescue oil prices from the coronavirus crisis will climax tomorrow, when ministers from OPEC and other key countries meet virtually to settle the geopolitical conflict and determine production cuts.

### **17.5 Coronavirus World Update, May 11: Wuhan's new COVID-19 cluster, members of USA coronavirus taskforce in quarantine**

**Source:** firstpost.com, 11 May, 2020

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Over 4.2 million people in the world have tested positive for COVID-19 so far. Out of this, 284,674 have died and 1.5 million have recovered.

Over 4.2 million people in the world have tested positive for COVID-19 so far, as per Worldometer.com's data. Out of this, 284,674 have died and 1.5 million have recovered from the disease.

The United Nations World Tourism Organisation reported last week that global tourism may drop by 60-80% in 2020 due to the pandemic. This would put the livelihood of millions at stake.

#### **Russia becomes a COVID-19 hotbed**

With constantly high daily-cases, Russia has now surpassed Italy and the UK and seems to be becoming the new epicentre of COVID-19 in Europe.

The country reported 11,656 new cases and 94 deaths on May 11, bringing the total number of cases to 221,344 and the total number of deaths to 2,009. More than half of these cases are reportedly from Moscow.

## **Wuhan reported new coronavirus cluster, South Korea trying to contain Seoul cluster**

After being opened for a month now, Wuhan, the original epicentre of the coronavirus disease, reported another COVID-19 cluster on Monday. The five patients who tested positive are reportedly from the same building compound and were previously classified as asymptomatic cases.

South Korea reported 34 new cases on Sunday and 35 on Monday, the highest this month. The surge in cases is being connected to nightclubs and bars after a single person (later tested positive for COVID-19 ) went to five nightclubs in Seoul in one night. As per media reports, about 1,500 people were present in all those nightclubs at the time. About 53 new cases have reportedly been connected to the outbreak. Seoul has closed nightclubs and bars to contain the outbreak.

## **Key members of US coronavirus taskforce in quarantine, Mike Pence will not self-isolate**

Three members of the USA coronavirus taskforce are in quarantine right now after they came in contact with a COVID-19 positive person. These include US FDA Commissioner Stephen Hahn, CDC director Robert Redfield and the physician and immunologist Anthony Fauci.

Fauci has already tested negative but may undergo multiple tests over the coming days.

Vice President Mike Pence's secretary Katie Miller also tested positive on Friday. However, as per media reports, the vice president will not self-quarantine and instead would keep working at the white house.

## **PM Boris Johnson's plans for lockdown changes**

On Sunday, UK's Prime Minister Boris Johnson revealed his plans to gradually bring the UK out of the lockdown. He said that the country will have a 5-level alert system which will be run by a new Joint Biosecurity Centre in the UK. Level 1 would mean no disease in the country and level 5 would be a red flag.

The PM further said that from Wednesday, people will be allowed to go out for exercise and sports (but only with household members). Those who can't work from home will be allowed to work, schools will be opened by June and the hospitality industry may open by July if cases recede. Physical distancing rules would still be in place, chargeable by a fine if broken.



## **17.6 Coronavirus Global Updates, 17 June: 'A welcome news but dexamethasone only be used under close clinical supervision,' WHO says**

**Source:** indianexpress.com ,17 June,2020

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Global Coronavirus (COVID-19) Cases Updates: The number of coronavirus fatalities in the United States surpassed the number of American military casualties in World War 1. At least five US states are seeing a record rise in cases and hospitalisations as the country accelerates reopening.



### **Nurses tend to COVID-19 patients at the Shohadaye Tajrish Hospital in Tehran, Iran**

Coronavirus Global Updates: Global cases of the novel coronavirus cases reached over 8.2 million on Wednesday, as infections surged in Brazil. The virus has so far claimed 444,563 lives as on today. The United States has by far the largest number of cases with 2,141,276 infections and 117,030 deaths.

Meanwhile, China's capital Beijing imposed restrictions in the city to contain the resurgent coronavirus cases by cancelling scores of flights, shutting schools and blocking off some neighbourhoods. In the past six days, Beijing has witnessed a resurgence of the disease, with some fearing the entire city is headed for a lockdown. Health officials reported 31 new

infections for June 16, taking cumulative cases since Thursday to 137 in the city's worst resurgence in four months, with 356,000 people tested since Sunday.

Britain on Wednesday authorised the state-funded National Health Service (NHS) to use steroid dexamethasone, the "world's first" coronavirus treatment proven to reduce the risk of death among severely ill patients, PTI reported. The cheap and widely used steroid has become the first drug shown to be able to save lives of terminally ill Covid-19 patients. Upon discovery, the scientists called it a "major breakthrough" in the pandemic, while the World Health Organisation hailed the research and announced to update its Covid-19 guidelines.

### **Kazakhstan's speaker of Parliament tests positive for Covid-19**

The speaker of Kazakhstan's lower house of parliament Nurlan Nigmatulin has self quarantined after he contracted coronavirus, authorities confirmed, Reuters said. The country raised an alarm as fresh surge in infections were witnessed in the capital Nur-Sultan. Last week, the speaker met Healthcare Minister Yelzhan Birtanov who then tested positive and is now in hospital being treated for pneumonia. President Kassym-Jomart Tokayev said the coronavirus situation was "challenging" because of widespread non-compliance with social distancing rules, but the government remained in control. "Tomorrow the government will announce measures to stabilise the epidemiological situation, including broader testing," he wrote on Twitter.

### **Honduran President, first lady test positive for Covid-19**

Honduran President Juan Orlando Hernández has tested positive for the novel coronavirus, his office said, news agency AP reported. In a statement issued by the presidency, it said, Hernández had followed recommended health precautions but "because of the nature of his work, it wasn't possible to remain in total isolation." He said his wife is asymptomatic and two other people who work with them are also infected. His office said Hernández began to feel ill over the weekend and his viral infection was confirmed on Tuesday. The statement said he was being treated with microdacyn, azithromycin, ivermectin and zinc. Hernández said his symptoms are light and that he's already starting to feel better. He said he had started what he called the "MAIZ treatment," an experimental combination of microdacyn, azithromycin, ivermectin and zinc. Honduras has nearly 10,000 confirmed cases of the disease and 330 deaths.

### **Over 400 people test positive for virus in Germany's slaughterhouse**

At least 475 people have tested positive for the coronavirus at Germany's biggest slaughterhouse Toennies in Rheda-Wiedenbrueck, AP reported. A further 400 test results were still pending. This massive spike in infections has pushed the number of cases in the

region far above the government's threshold for emergency measures which is set at 50 new infections in a week per 100,000 inhabitants. Following the outbreak, authorities in the western German region of Guetersloh have ordered the closure of all schools and childcare centers. Regional daily Westfalen-Blatt reported that officials believe some of the cases were imported from other countries by migrant workers who took advantage of newly reopened European borders to visit their families.

### **Steroid Dexamethasone approved as COVID-19 treatment in UK**

The UK government Wednesday authorised the state-funded National Health Service (NHS) to use steroid dexamethasone, the “world’s first” coronavirus treatment proven to reduce the risk of death among severely ill patients, PTI reported. The Department of Health said the cheap and widely available anti-inflammatory steroid has been immediately approved to treat all hospitalised COVID-19 patients requiring oxygen, including those on ventilators, after an Oxford University trial confirmed positive results on Tuesday. “The standard treatment for COVID-19 will include dexamethasone, helping save thousands of lives while we deal with this terrible virus,” said UK Health Secretary Matt Hancock.



**A pharmacist displays a box of Dexamethasone at the Erasme Hospital amid the coronavirus disease (COVID-19) outbreak, in Brussels, Belgium, June 16, 2020**

### **WHO moves to update Covid-19 guidance after dexamethasone clinical results**

The World Health Organisation (WHO) said it was moving to update its Covid-19 guidelines on treating people to reflect results of a clinical trial that showed a cheap, common steroid

can help save critically ill patients, Reuters reported. On Tuesday, trial results announced showed dexamethasone, used since the 1960s to reduce inflammation in diseases such as arthritis, cut death rates by around a third among the most severely ill COVID-19 patients admitted to hospital.

Although the dexamethasone study's results are preliminary, the researchers behind the project said it suggests the drug should immediately become standard care in severely stricken patients. According to the preliminary findings shared with the WHO, mortality rate was reduced by about one third for patients on ventilator and for patients requiring only oxygen, mortality was cut by about one fifth.

### **German coronavirus tracing app downloaded 6.5 million times**

In the last 24 hours, since its launch, Germany's smartphone app to help trace coronavirus infections has been downloaded 6.5 million times, the chief executive of software company SAP said, Reuters reported. The 'Corona-Warn-App' was made in six weeks by SAP and Deutsche Telekom. "It's a big success, it scales, it's user friendly and it helps society," Klein told journalists in a video briefing. Widespread take-up is needed, however, to increase the chance that both people in a risk event – spending 15 minutes within 2 metres of each other – use the app. In field tests, the app successfully recorded 80% of such encounters.



**Timotheus Hoettges, Chief Executive Officer of Germany's telecommunications giant Deutsche Telekom AG, holds a mobile phone as he attends the presentation of the new contact-tracing smartphone app**

## **Singapore scientists discover 5 antibodies to combat virus**

A team of Singapore scientists has discovered five antibodies that can fight the coronavirus and protect against the key mutations that have emerged in the virus during the pandemic, the country's defence research and development organisation said, PTI reported. Human trials for the lead antibody, AOD01, will commence in the coming months, pending approval from the Health Sciences Authority, said the Defense Science Organisation (DSO) National Laboratories.

"They are all potent in blocking infection and effective against key mutations that have emerged in the virus during the pandemic," it said.



**Essential workers have their noses swabbed before returning to the workforce at a regional screening center amid the coronavirus disease (COVID-19) outbreak in Singapore June 9, 2020**

## **Record spike in coronavirus cases in US states**

Fresh coronavirus cases hit a record high in Arizona, Florida, Oklahoma, Oregon and Texas on Tuesday showcasing a rising trend in new cases for the second consecutive week. As the states accelerate reopening the number of hospitalisations are also rising to record highs.



### **Following a new surge in Beijing, flights cancelled, schools closed**

China's capital witnessed a slight increase in new coronavirus cases Wednesday as it fights a new outbreak after almost two months. Beijing has introduced a wave of new restrictions including cancelling over 60 commercial flights in and out of the city, especially from districts that are reporting cases. Beijing's education commission ordered the closure of schools to stop the new surge in cases.



### **People wearing face masks to protect against the new coronavirus stop at a checkpoint outside the Xinfadi wholesale food market district in Beijing**

Beijing reported 31 cases up from 27 the day before in an outbreak that has been primarily linked to a wholesale food market.

### **New Zealand PM assigns military to oversee border quarantine measures**

New Zealand Prime Minister Jacinda Ardern has assigned a top military leader to oversee the country's border quarantine measures after what she described as an unacceptable failure by health officials in allowing two women who returned from London to leave quarantine before they had been tested for the virus.



### **Jacinda Ardern speaks to media on June 17 after two new cases were reported**

Before the two new cases, the country was declared as coronavirus free after not reporting any case for more than 3 weeks.

### **Dexamethasone drug offers some hope as cases surge**

Researchers in the UK Tuesday announced the first evidence of a drug that can improve COVID-19 survival. The drug, dexamethasone, is a cheap and widely available steroid that reduced deaths by 35% in patients who needed treatment with breathing machines and by 20% in those only needing supplemental oxygen. However the drug did not appear to help people with less serious symptoms.

British Prime Minister Boris Johnson said the drug was the biggest breakthrough yet in treating the coronavirus.

Meanwhile, Israel has signed an agreement with Moderna Inc for the future purchase of a potential coronavirus vaccine in case the company succeeds in its development.

### **Singapore to start human trials of vaccine in August**

Singapore scientists testing a COVID-19 vaccine from US firm Arcturus Therapeutics plan to start human trials in August after showing a promising response in mice.

The vaccine being evaluated in Singapore works on relatively-untested Messenger RNA (mRNA) technology, which instructs human cells to make specific coronavirus proteins that produce an immune response.

### **17.7 Highlights: Florida records more than 12,600 new Covid-19 cases**

**Source:** hindustantimes.com,14 July,2020

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#### **A health worker wearing PPE overalls conducts a coronavirus test, at a COVID-19 testing centre**

India in the past few days has been witnessing a daily highest-spike in coronavirus cases. As per the Ministry of Health and Family Welfare, India registered yet another single-day spike of 28,701 Covid-19 cases and 500 deaths. Recovery numbers have overtaken active cases, but India hasn't yet reached its peak, after which the cases would start depleting. The states of Maharashtra, Tamil Nadu, Delhi, Karnataka are worst-hit by the pandemic. Fresh lockdowns ranging from a week to a fortnight have been imposed in several parts of the country to curb and check the spread of the infection.

Multiple nations, including India are speeding up their research and development to come up with a vaccine that can provide absolute immunity against Covid-19 without any side effects. Last evening, Russia's Sechenov First Moscow State Medical University successfully completed the clinical trials on volunteers of the world's first vaccine.

In view of the rising cases in the United States, President Donald Trump was finally seen sporting a mask during his visit to a military hospital on Saturday. He said that he was never against facial coverings and that they have a time and place.

### **UK report 148 new coronavirus fatalities**

The UK has reported 148 new coronavirus disease-related deaths over the preceding 24 hours, ANI reported.

This latest rise sees the UK's Covid-19 death toll rise to 44,798.

On Friday, just 48 new deaths were confirmed by public health officials.

### **Florida records more than 12,600 new coronavirus cases**

Florida recorded more than 12,600 new coronavirus cases on Monday, its second-highest daily total since the outbreak began.

Florida along with Arizona, California and Texas have emerged as the new US epicenters of the coronavirus pandemic in recent weeks.

### **As Covid-19 cases rise, Disney to shut Hong Kong Disneyland again**

Walt Disney Co. is temporarily closing its Hong Kong Disneyland theme park from July 15 amid rising coronavirus cases in the Chinese-ruled city, the company said Monday.

The announcement came two days after Disney reopened its biggest resort, Walt Disney World in Orlando, Florida, as coronavirus cases surged in the state.

### **No return to the 'old normal' for foreseeable future with Covid-19 pandemic: WHO**

No return to the 'old normal' for foreseeable future with Covid-19 pandemic, said World Health Organisation's chief Tedros Adhanom on Monday as the global cases surpassed 13 million mark.

### **Philippines sees region's biggest daily rise in Covid-19 deaths**

The Philippines reported Southeast Asia's biggest daily jump in Covid-19 deaths on Monday and warned of more fatalities ahead, as authorities scrambled to verify thousands of suspected cases and pressure grows on hospitals after the easing of a lockdown.

The health ministry reported 162 new deaths that were confirmed on Sunday plus another 65 on Monday, with 2,960 additional infections. The Philippines over the past week has reported higher daily infections than Indonesia, which has Southeast Asia's highest number of deaths and cases.

## **17.8 Covid-19 vaccine: Key updates on which country stands where on development**

**Source:** [livemint.com](https://livemint.com), 19 July, 2020

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- India, Russia, US, UK are fast-tracking their processes to develop a vaccine for the virus
  - US, Western Europe and China have all set up research programs and supply chains for Covid-19 vaccine production



**A photo shows vaccines in prefilled, single-use syringes before the inspection and packaging phase at the French pharmaceutical company Sanofi's world distribution centre in Val de Reuil on July 10, 2020**

The race for developing a potential Covid-19 vaccine is in the rounds for quite some time as the novel coronavirus cases across the world has crossed 14 million-mark in infections and killed over 6 six lakh people.

Amid the infections and recoveries, several countries such as India, Russia, US, UK are fast-tracking their processes to develop a vaccine for the virus. US, Western Europe and China have all set up research programs and supply chains for Covid-19 vaccine production.



**India:**

India's first indigenous Covid-19 vaccine Covaxin got a nod from the AIIMS Ethics Committee on Saturday to start human trials from Monday. AIIMS-Delhi is among the 12 sites selected by the Indian Council for Medical Research (ICMR) for conducting phase I and II human trials of Covaxin. In phase I, the vaccine would be tested on 375 volunteers and a maximum of 100 of them would be from AIIMS.

Drug firm Zydus Cadila also said it has started human clinical trials of its COVID-19 vaccine candidate ZyCoV-D. In the phase of trials, the company will be enrolling over 1,000 subjects across multiple clinical study sites in India, it said in a regulatory filing.

**Russia:**

Russian health minister said they will make a coronavirus vaccine candidate it is working on available to general public before it clears the third and last phase of clinical trials, according to a new report.

According to a Bloomberg report, Kirill Dmitriev, the chief executive of the government-backed Russian Direct Investment Fund (RDIF), said the vaccine will start phase 3 trials in thousands of people on Aug. 3 in Russia as well as in Saudi Arabia and the United Arab Emirates. "Russia could make 30 million doses domestically in 2020, and 170 million abroad, with five countries expressing interest in producing the vaccine and others willing to produce it", he said.

**China:**

China has positioned itself to be a strong contender. The human trials being conducted by Chinese company Sinovac Biotech have reached the third stage. This is the first vaccine to reach the third stage of human trials. The first dose was given to 15,000 registered volunteers in Abu Dhabi. They were administered the vaccine twice within 28 days and the researchers saw development of anti-bodies in them. There are four vaccines being developed in China for Covid-19.

Eight of the nearly two dozen potential vaccines in various stages of human testing worldwide are from China, the most of any country. And SinoPharm and another Chinese company already have announced they're entering final testing.

**United Kingdom:**

The vaccine developed by Oxford University and Imperial College are in second and third stage of human trials. In the second stage, 105 people are expected to be administered the vaccine. The stage 3 trial is expected to begin in November and will cover 6,000 people.

Recently, researchers at the University of Oxford believe they may have a breakthrough in their search for a COVID-19 vaccine after the team discovered that the jab could provide "double protection" against the deadly coronavirus following early stage human trials, according to media reports in the UK.

Blood samples taken from a group of UK volunteers given a dose of the vaccine showed that it stimulated the body to produce both antibodies and "killer T-cells", a senior source from the trial was quoted by 'The Daily Telegraph' as saying.

#### **United States:**

US biotech firm's Covid-19 vaccine produced antibodies to the coronavirus in, all patients tested in an initial safety trial, federal researchers said. Moderna's initial results are from the first group of 45 patients who received the vaccine, called mRNA-1273. It evaluated three doses that were given in a two-shot regimen. The middle one was selected for use in the large final-stage study that is slated to begin on July 27th.

### **17.9 Russia all set to launch world's first COVID-19 vaccine next week, 'hope they have tested it', says Fauci**

**Source:** [livemint.com](https://www.livemint.com), 8 August, 2020

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- The vaccine was developed by Gamaleya Research Institute and the Russian Defence Ministry
  - Clinical trials of the vaccine began on June 17 among 76 volunteers

Amid the high number of coronavirus cases across the world, Russia is all set to register world's first COVID-19 vaccine next week, according to reports. The vaccine was developed by Gamaleya Research Institute and the Russian Defence Ministry. The vaccine will be registered on August 12.

"The COVID-19 vaccine developed by the Gamaleya centre will be registered on August 12. At the moment, the last, third, stage is underway. The trials are extremely important. We have to understand that the vaccine must be safe. Medical professionals and senior citizens will be the first to get vaccinated," Gridnev told reporters, according to reports. After the registration, the vaccine will be reportedly tested on about 1,600 people to ensure its safety and effectiveness.

In April, Russia President Vladimir Putin ordered state officials to shorten the time of clinical trials for a variety of drugs, including potential coronavirus vaccines.



**World Health Organization on Tuesday urged Russia to follow the established guidelines for producing a COVID-19 vaccine**

Clinical trials of the vaccine began on June 17 among 76 volunteers. Half were injected with a vaccine in liquid form and the other half with a vaccine that came as soluble powder, according to news agency AP.

Initial reports showed immunity in all participants, the Russian Defence Ministry said. "The results of the check-up clearly demonstrate an unmistakable immune response attained through the vaccination. No side effects or issues with the body of the volunteers were found", the ministry said, according to Sputnik News.

"We are very much counting on starting mass production in September," Industry Minister Denis Manturov said in an interview published by state news agency TASS.

World Health Organization on Tuesday urged Russia to follow the established guidelines for producing safe and effective vaccines after Moscow announced plans to start swiftly producing COVID-19 jabs.

"There are established practices and there are guidelines out," WHO spokesman Christian Lindmeier told reporters at the United Nations in Geneva. "Between finding or having a clue of maybe having a vaccine that works, and having gone through all the stages, is a big difference." he said.

Apart from the vaccine formulated by the Gamaleya Research Institute, Russia's Vektor State Research Center of Virology and Biotechnology has also started developing a COVID-19 vaccine.

"I'm worried that Russia is cutting corners so that the vaccine that will come out may be not just ineffective, but also unsafe," said Lawrence Gostin, a global public health law expert at Georgetown University.

Dr Anthony Fauci, the top US infectious disease specialist, questioned the fast-track approach last week. "I do hope that the Chinese and the Russians are actually testing a vaccine before they are administering the vaccine to anyone, because claims of having a vaccine ready to distribute before you do testing I think is problematic at best," he said.

### **17.10 France Covid-19: Paris compulsory face-mask rule comes into force**

**Source:** [bbc.com](https://www.bbc.com/news/health-55484444), 28 August, 2020



**Parisian cyclists don't have to wear a face mask but some are taking extra precautions Wearing a face mask in public has become mandatory across Paris and several surrounding areas, amid a surge in Covid-19 cases in France.**

On Friday the country recorded 7,379 new infections - its highest number since early May.

The number of "red zones" where the virus is in active circulation has risen from two to 21.

Announcing new local curbs on Thursday, PM Jean Castex said he wanted to avoid another general lockdown.

He said the coronavirus was "gaining ground" across France, and that if the government did not act fast infection growth could become "exponential".

Despite a sharp rise in cases in recent weeks, daily death tolls have remained low. Overall, more than 30,500 people have died and almost 300,000 have been infected in France.

A number of European countries are seeing a surge in new cases, and Germany is also planning tighter rules.

Chancellor Angela Merkel warned on Friday that in the coming months things would become "even more difficult than now", as people have been able to enjoy life outdoors over the summer.

### **Masks for Paris**

The French prime minister said all pedestrians would have to wear face masks in public areas in the capital from 08:00 on Friday (06:00 GMT).

While individual streets and areas of the capital already have rules on wearing face coverings, this new rule will be far more extensive, covering not only Paris but its inner ring of Seine-Saint-Denis, Hauts-de-Seine and Val-de-Marne.

Mask-wearing has taken over the streets of Paris by stealth over the past few months, and the blanket enforcement of face masks in and around the capital from 08:00 triggered little real outcry, except for one thing: the new rules were originally designed to apply to cyclists and runners, along with pedestrians.

By the time the regulation came into force this morning, Paris city hall had intervened, and won a reprieve, saying it was "dangerous" and "counter-productive" to force these two groups to wear masks, especially when the mayor had been encouraging people to cycle to work to relieve pressure on public transport.

Runners and cyclists aside, only a handful of people were still out without a mask in my neighbourhood this morning, and there seems to be a lot of support for the measure around the capital. "It's better than being locked down," one woman said. Another resident said the government should have brought it in earlier, so that "the situation wouldn't have got as bad as it is now".





**While cyclists have been given a reprieve, the rules still stand for motorcyclists and people on scooters**

Asked on Friday if smokers could take off the mask to have a cigarette, Paris Deputy Mayor Anne Souyris made clear this was not the case. "You're not allowed to smoke on the street without a mask; you can't take it off, so you must find another way," she told the Cnews channel.

Paris is already a red zone, along with the southern area of Bouches-du-Rhône, where France's second-largest city Marseille made masks compulsory from Wednesday evening. A broad expanse of the Mediterranean coast and the Gironde area around Bordeaux are also red zones.

Masks will also become part of normal life for French schoolchildren aged 11 and over. The World Health Organization (WHO) has recommended use of masks in school from the age of 12.

Masks are already required in most enclosed public spaces and will be mandatory in workplaces from next week. However, the two biggest cities in the Netherlands have decided to scrap a pilot scheme for compulsory masks in their busiest areas on Monday.

The Amsterdam and Rotterdam authorities say they may bring back the requirement if necessary, but they believe that as the warm weather and high tourist season come to an end it will be easier to maintain social distancing of 1.5m (5ft).

## **What has Germany decided?**

Masks are a key part of Germany's tougher restrictions aimed at curbing a renewed rise in cases. Although Germany has not seen the scale of Covid-related deaths as many other Western European countries, the federal government and 16 states have reached a deal on new measures:

A minimum €50 (£45) fine will be slapped on anyone breaking rules on face coverings - in shops, public transport or elsewhere; Lower Saxony in the north-west will not impose fines but Bavaria in the south will set higher penalties

Big events will be banned until the end of the year, although regions will be exempt if they have a low infection rate and participants are limited to those areas

A working group will be set up to discuss Bundesliga football matches, but no spectators will be allowed in until at least the end of October

There will be an end to free tests for holidaymakers returning from high-risk countries after 15 September. Travellers already have to self-isolate for 14 days. Bavaria will continue free testing until 1 October.

During her summer press conference on Friday, Mrs Merkel said Germans would "have to live with this virus for longer" and maintain vigilance, especially as the number of infections had risen in recent weeks. Another 1,571 cases and three more deaths were reported on Friday.

Meanwhile, a group called "Querdenken" (Think outside the box) is challenging a Berlin ban on a march on Saturday against Covid-19 restrictions. The protest has already seen 22,000 people sign up.

A march on 1 August attracted around 20,000 people, made up of mainly Covid-deniers and far-right activists.

## **17.11 Researchers find coronavirus was circulating in Italy earlier than thought**

**Source:** reuters.com,16 September,2020

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ROME (Reuters) - The new coronavirus was circulating in Italy in September 2019, a study by the National Cancer Institute (INT) of the Italian city of Milan shows, signaling that it might have spread beyond China earlier than thought.



**People wearing protective masks walk in the street as the region of Campania becomes a 'red zone', as part of tougher measures to tackle the spread of the coronavirus disease (COVID-19), in Naples, Italy November 16, 2020. REUTERS/Ciro De Luca**

The World Health Organization has said the new coronavirus and COVID-19, the respiratory disease it causes, were unknown before the outbreak was reported in Wuhan, central China, late last year. But it has said “the possibility that the virus may have silently circulated elsewhere cannot be ruled out.”

The WHO said on Monday it was reviewing the results from Italy and additional information published there at the weekend and was seeking clarification.

Italy’s first COVID-19 patient was detected on Feb. 21 in a small town near Milan, in the northern region of Lombardy.

The Italian researchers’ findings, published by the INT’s scientific magazine Tumori Journal, show 11.6% of 959 healthy volunteers enrolled in a lung cancer screening trial between September 2019 and March 2020 had developed coronavirus antibodies well before February.

A further SARS-CoV-2 antibodies test was carried out by the University of Siena for the same research titled “Unexpected detection of SARS-CoV-2 antibodies in the pre-pandemic period in Italy”.

It showed that four cases dating back to the first week of October were positive for antibodies, meaning they had got infected in September, Giovanni Apolone, a co-author of the study, told Reuters. “This is the main finding: people with no symptoms not only were positive after the serological tests but also had antibodies able to kill the virus,” Apolone said.

“It means that the new coronavirus can circulate among the population for a long time and with a low rate of lethality, not because it is disappearing, only to surge again,” he said. The WHO said it would contact the paper’s authors “to discuss and arrange for further analyses of available samples and verification of the neutralization results”. Italian researchers told Reuters in March that they reported a higher than usual number of cases of severe pneumonia and flu in Lombardy in the last quarter of 2019 in a sign that the new coronavirus might have circulated earlier than thought.

### **17.12 Coronavirus: Spain orders Madrid lockdown as COVID-19 cases soar**

**Source:** news.sky.com,1 October,2020

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**A man gets his temperature checked in Vallecas, Madrid, which has already been under partial lockdown**



The regional government rejects the central government plan that imposes stricter mobility curbs and limits on social gatherings.

Residents in Madrid will be banned from leaving the city, except on essential trips, under strict new coronavirus restrictions imposed by the Spanish government.

Madrid has 735 cases of COVID-19 per 100,000 people, one of the highest of any region in Europe and double the national rate.

But regional authorities said the decision had no legal basis, setting the stage for a political showdown in an area accounting for more than a third of Spain's 133,604 new cases in the past two weeks.

Under the new measures, the capital city's borders will be closed to outsiders for non-urgent visits.

Another nine cities in the metropolitan area are also affected.

"Madrid's health is Spain's health. Madrid is special," Health Minister Salvador Illa told a news conference to announce the new regulations, which are due to come into force in the coming days. He did not say exactly when.

People will be allowed to cross municipal boundaries to go to work or school, visit the doctor or go shopping, but must remain within the city for leisure activities.

Other measures include the closure of bars and restaurants at 11pm, from a previous curfew of 1am, as well as the closure of public parks and playgrounds.

Social gatherings will be limited to six people.

The conservative regional assembly had already enforced localised lockdowns in 45, mostly poor districts, often with a high immigrant population.

But the new wider restrictions see the central government overriding the regional government after weeks of fighting between the two authorities over what should be done in the city.

"The decision is not valid legally," regional health chief Enrique Ruiz Escudero repeatedly told a news conference of the

lockdown plan, even though the local authorities had seemingly accepted some steps earlier this week. "The Spanish government is in a hurry to intervene in Madrid but not to defeat the virus."



The fallout has taken the political polarisation that has characterised much of the response to the pandemic over the past months to new heights, exasperating communities.

Madrid's refusal to adopt national standards approved by 13 of Spain's 19 regions and autonomous cities represented a new setback for Prime Minister Pedro Sánchez's left-wing coalition, which is trying to push for a stricter response in the opposition-ruled Spanish capital. Spain has recorded a total of 769,188 cases, more than any other nation in Western Europe. The total death toll stands at 31,791.

"We must be conscious that there are tough weeks, very tough, ahead," Mr Illa said.

### **17.13 Covid: UK at 'tipping point', top scientist warns**

**Source:** [bbc.com](https://www.bbc.com/news/health-55844444), 11 October, 2020



**The UK has reached a "tipping point" in its coronavirus epidemic similar to that last seen in March, one of the country's top scientists has warned**

England's deputy chief medical officer Prof Jonathan Van-Tam said the seasons were "against us" and the country was running into a "headwind". More deaths would follow a rise in cases over coming weeks, he said, and urged people to limit social contact.

On Monday, Boris Johnson is expected to announce tougher restrictions.

In a statement to MPs, the prime minister is expected to set out plans for a three-tier local lockdown system which would see every region in England placed in one of three tiers, depending on the severity of cases.

Across the UK, the R number - the average number of people each infected person passes the virus onto - is now estimated between 1.2 and 1.5. Anything above 1.0 means cases are increasing.

On Saturday, 15,166 people in the UK were reported to have tested positive for coronavirus - up 1,302 on Friday's figure, according to the government's dashboard. There were a further 81 deaths - a decrease of six on Friday.

However, the Office for National Statistics estimates 224,000 people in homes in England had the virus, up to 1 October - roughly double the figure reported by the ONS for each of the preceding two weeks.

In his statement published on Sunday, Prof Van-Tam said that while the epidemic "re-started" again among younger people over the past few weeks, there is "clear evidence of a gradual spread into older age groups" in the worst-hit areas.

"Sadly, just as night follows day, increases in deaths will now follow on in the next few weeks," Prof Van-Tam said.

He warned that the UK was in a different position than during the first wave because "we are now are going into the colder, darker winter months".

"We are in the middle of a severe pandemic and the seasons are against us. Basically, we are running into a headwind," he said.

But he also said the UK has "much improved testing capabilities" and "better treatments" available, meaning that "we know where it is and how to tackle it".

He stressed the importance of following public health guidance and minimising contact with others, adding: "I know this is very hard, but it is an unfortunate scientific fact that the virus thrives on humans making social contact with one another."

It comes as the Labour Party and business groups voiced concern at the "ripple effect" of Covid shutdowns that are expected to be announced on Monday.

Labour claims that close to one million workers will be at risk because the chancellor's plan to pay staff at UK companies that are told to close 67% of their wages does not extend to those who may be indirectly affected, such as those in supply chains.

The Treasury denied firms that are not fully closed would not receive help.

A spokesperson said: "We do not recognise these figures," adding that Labour had "incorrectly" listed some sectors as not benefitting from the scheme.

Prime Minister Boris Johnson will set out the new rules for hotspots in the House of Commons on Monday.

Every region of England is expected to be placed in one of three tiers, with the Liverpool City Region thought to be in the category with the strictest rules.

Plans are not yet finalised, BBC political correspondent Chris Mason said, but that is likely to mean pubs will close, restaurants could face restrictions, people may even be told not to travel in and out of the area. Schools and universities would remain open.



### **Pubs and restaurants across the central belt of Scotland have closed for the last time in at least two weeks**

More talks are expected on Sunday between the government and leaders in parts of England that are expecting new restrictions. Council leaders and mayors have expressed their anger at what they see as inadequate help for those who will no longer be able to work. Many regions are demanding more local control over contact tracing, while others have raised the possibility of legal action if they do not get the support they demand. The government says it is committed to involving local leaders in decision-making.

Discussions with Downing Street on Friday were described on Merseyside as "frosty," but "cordial and giving on both sides". Leaders in Greater Manchester do not yet have another

meeting with the government arranged, Chris Mason added - but one is expected before the prime minister's statement on Monday.

In Nottingham, Newcastle, Sunderland, Leeds and elsewhere, leaders and residents await the announcement of the template for the next phase of the pandemic.

### **17.14 UK coronavirus death toll rises by almost 500 in 24 hours**

**Source:** independent.co.uk, 4 November, 2020

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Total of 25,177 new infections reported across the UK, government figures show

The UK has registered 492 new coronavirus deaths over the latest 24-hour period, according to new government data.

This is the highest figure since 19 May, when 500 deaths were reported nationwide.

The number of people in the UK to die within 28 days of a positive Covid test now stands at 47,742.

Separately, 60,051 deaths with Covid-19 on the death certificate have been recorded since the onset of the pandemic.

According to the NHS, one of the victims was aged 13 years old. Of the 302 deaths recorded in England, all except 12 had known underlying health conditions.

A further 25,177 new infections were reported across the UK, data from the Department of Health and Social Care shows, bringing the nationwide total to 1,099,059.

The new figures come as MPs voted to back the new four-week coronavirus lockdown in England, after Boris Johnson warned of an “existential threat” to the NHS if action was not taken.

Ahead of the Commons vote on Wednesday, the prime minister said the government was not seeking to impose the new controls “lightly”. But he told MPs at Prime Minister’s Questions that it was essential that they took action now to curb the spread of the disease.

With Labour supporting the new restrictions, the government comfortably passed the vote with a majority of 478 – though 38 Tory MPs defied the party whip to vote against the new restrictions.

Prior to the vote, the PM had urged all MPs to put aside “party political wrangling and point-scoring” and to come together to drive down the infection rate.

Health secretary Matt Hancock said that in ordinary times the measures outlined would be “unimaginable”.

He told the Commons: “Ultimately this comes to a very significant judgement. It comes to a judgement about how we best manage a nation and lead a nation through an incredibly difficult period, with a pandemic of a virus which exists only to multiply.

“So in ordinary times, these measures would be unimaginable, but these are not ordinary times. It’s a virus in circulation that feeds off the human contact that makes life worth living and we must act to thwart its deadly march to protect our NHS and to save countless lives.”

The new restrictions will be implemented from midnight, as the NHS in England moves into its highest alert – level 4 – amid a continuing rise in coronavirus patients needing hospital care.

Earlier in the day, the head of NHS England said the service was ready to “fire the starting gun” whenever a vaccine became available.

Chief executive Sir Simon Stevens said GPs will be put on standby from December should a vaccine become available before Christmas.

However, he said the “expectation” was that any vaccination programme would begin in the new year – pending positive results from the clinical trials.

Meanwhile, the chief of the UK vaccine taskforce has said she is more than 50 per cent confident that all vulnerable people will have been vaccinated against coronavirus by Easter or early summer, with GPs across the country now prepping to administer a Covid-19 jab over the Christmas period.

Kate Bingham told MPs that there was a “very high” chance that a vaccine would be effective in reducing illness and mortality, but said it was unlikely that it would be able to entirely eradicate the virus.

She said that data from the Oxford and Pfizer/BioNTech candidates would be available by the end of the year, with millions of doses from the two leading vaccines set to be rolled out across the UK as soon as regulatory approval is granted.

“If I put on my rose-tinted specs, I would hope that we will see positive interim data from both Oxford and from Pfizer/BioNTech in early December and if we get that then I think we have got the possibility of deploying by the year-end,” she said during Wednesday’s Science and Technology Committee meeting.



## **17.15 Hull left forgotten as Covid cases soar in city, council boss says**

**Source:** theguardian.com ,16 November,2020

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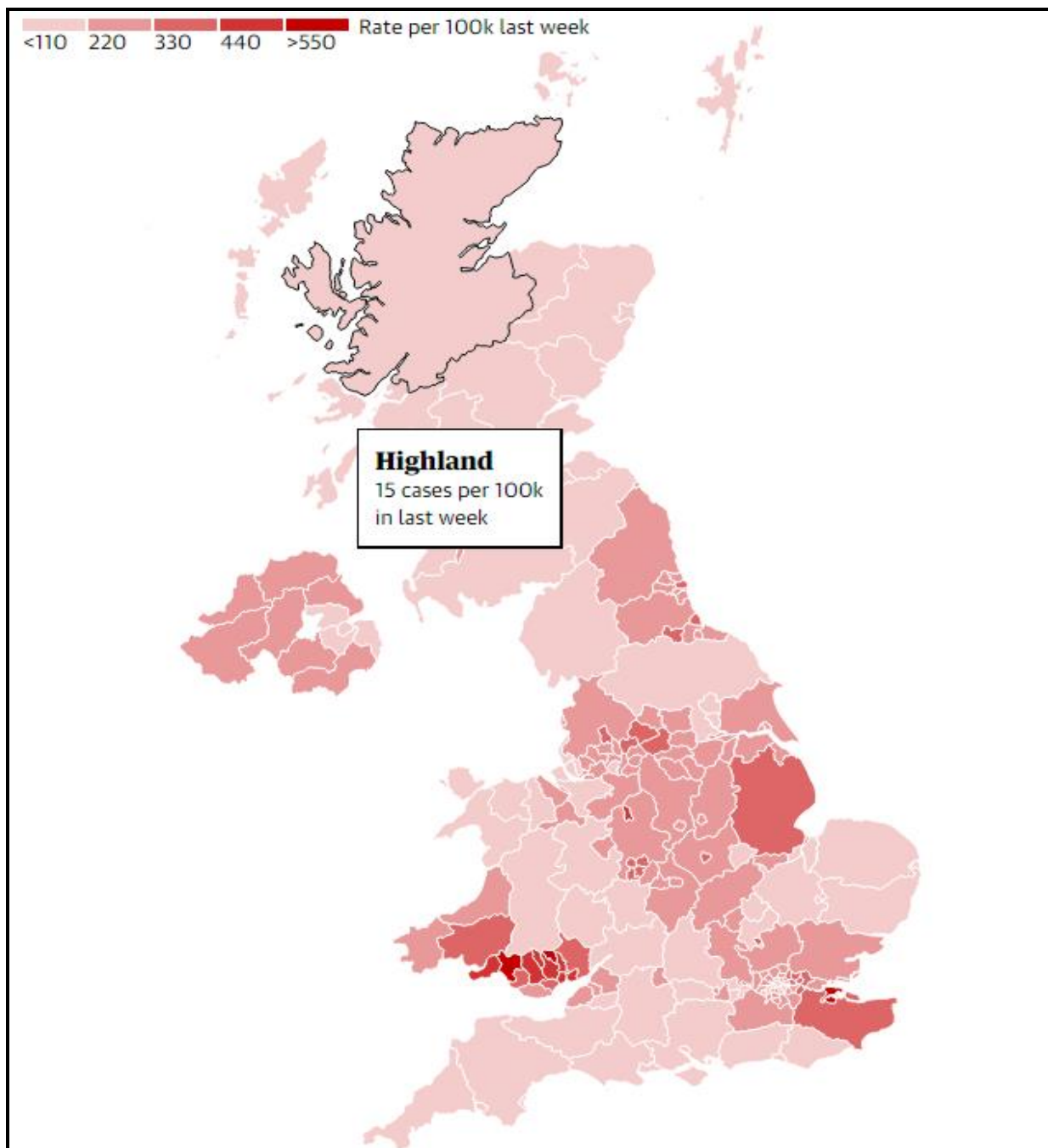
**A man walks through Hull city centre. The Covid case rate is almost triple England's average at 770 cases per 100,000 people.**

Hull has been “forgotten” by central government as the city’s coronavirus cases have increased at an “astonishing and terrifying rate” to become the highest in England, its council leader has said.

Stephen Brady of Hull city council said it needed urgent national support but had received no contact from the government.

The number of coronavirus patients in Hull’s hospitals has passed the peak of the first wave and its infection rate has risen tenfold in barely five weeks.

At 770 cases per 100,000 people it is nearly triple England’s average and far higher than other Covid-19 hotspots. A council spokeswoman said public health officials were warning that the peak in Hull – which has recorded 252 coronavirus deaths – is yet to come.



**Data: data.gov.uk. Cases per 100k in the seven days to 1 Dec 2020. Cases assigned to date of test. If any area in a local authority is in higher restrictions than the rest of the county, restrictions map shows the whole county in these restrictions**

In a letter to Boris Johnson on Monday, Brady said: "I am writing to express my grave concerns about the consequences of the current Covid-19 health emergency in Hull and the absence of central government support to assist us in overcoming it.

“As I am sure you are aware, our infection rate is now one of the highest in the country and ... the infection rates in our city have increased at a, frankly, astonishing and terrifying rate over the last few weeks.”

He continued: “Hull and our people have dealt with some huge challenges in the past, and we have always overcome them, but, on this occasion, as has too frequently been the case in the past, we seem, once again, to be the forgotten city.”

Brady asked Johnson for more freedom to enforce local restrictions, more support from Public Health England, discussions about what will happen in Hull when the planned period of national restrictions ends, discussions about financial support for local businesses, and additional support and resources for the area’s hospitals.

On Monday the council said there were 188 confirmed Covid-positive patients in hospital in Hull, with a further 38 suspected cases.

Mike Whale, the Hull district secretary for the National Education Union, said three in every 10 children were out of school self-isolating in the city – which would amount to about 12,000 children. He said there was huge support among Hull’s teachers to close the city’s schools until the virus was under control. “While children may not be overly vulnerable, the number of adult staff in schools who are currently isolating is really significant and schools are really struggling to stay open,” he said.

The cause of the exponential rise in cases – up from 75.4 per 100,000 on 1 October – remains unclear but Dr Cheryl Walter, a virologist at the University of Hull, has said she believes it may in part be due to the city having low immunity levels.

Hull managed to avoid the worst of the first wave and continued to have low case numbers throughout the summer, compared with other parts of northern England where the infection rate remained relatively high when the first national lockdown was lifted.

Walter said the virus may have crept over to Hull from nearby areas on the “M62 corridor”. She told the Hull Daily Mail that a potential reason for the rise was “we had little ‘community immunity’ going into the second wave, as London did and ... winter is almost always a time of year when airborne infectious diseases are most prevalent”.

Boris Johnson addressed Tory MPs in northern England who have formed a pressure group that has taken Downing Street to task over the impact of Covid-19 lockdown measures. He labelled the MPs his “praetorian guard”.

More than 50 Tory MPs signed a letter to Johnson last month – before the imposition of the current 28-day restrictions – urging him to provide a “clear roadmap” out of lockdown, arguing that pandemic “has exposed in sharp relief the deep structural and systemic

disadvantage faced by our communities”. One Conservative MP on the hour-long Zoom call said: “He was on fantastic form, he took the entire meeting standing up. He was very animated, bouncy. He was clearly not a man in poor health. He said he wants us to open up as much as we can on the 2 December but that we had to recognise that this was a dangerous, nasty illness that we needed to get under control.”

### **17.16 International update: Global Covid infections pass 63.3 million – more than 1.47 million deaths**

**Source:** pharmaceutical-technology.com,1 December,2020

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**Global:** Global coronavirus infections have passed 63.3 million. Meanwhile, the global coronavirus death toll exceeds 1.47 million according to researchers at Johns Hopkins University.

The director general of the World Health Organization has warned that spending time with friends and family at Christmas is “not worth putting them or yourself at risk”. Tedros Adhanom Ghebreyesus, the body’s director general, said people should consider whether travelling during the festive period is necessary.

**US:** The US coronavirus death toll is 268,103 according to researchers at Johns Hopkins University, total infections number more than 13.5 million.

Scientists at the US Centers for Disease Control and Prevention found evidence of Covid infection in blood donations collected by the American Red Cross from residents in nine US states between 13 December 2019, and 17 January, 2020, according to a study published online in the journal Clinical Infectious Diseases.

Food and Drug Administration Commissioner Stephen Hahn has been summoned to a meeting by White House Chief of Staff Mark Meadows to explain why he hasn’t moved faster to approve the Pfizer coronavirus vaccine, Axios reported, citing two senior administration officials. The meeting is set for Tuesday at 9:30 am in Washington, Axios said. White House coronavirus adviser Scott Atlas, who won President Donald Trump’s favor by advocating the loosening of social distancing restrictions during the pandemic, resigned his post on Monday, according to a White House official. Texas’s virus hospitalizations rose to 8,900, the third straight daily increase and the highest since 1 August, when the state’s initial outbreak was still raging.

**France:** France has seen its death toll rise by 406 to 52,731. Its health ministry said there were 4,005 new cases, fewer than on Sunday. It has also seen a fall in people in intensive

care, and in the numbers admitted to hospital due to the virus. The country's seven-day average of daily new infections stands at 11,118, an almost two-month low.

**Brazil:** Brazil's health ministry has confirmed 21,138 new cases of Covid-19 and 287 deaths. Earlier on Monday, the WHO urged its government to be "very, very serious" about its rising coronavirus infection numbers, as more than 170,000 have now been killed.

**Mexico:** Mexico is in a "bad shape" as coronavirus cases and deaths surge, according to the WHO. The country's death tally is now more than 105,500 and confirmed cases have passed 1.1 million. Public health experts believe it is likely to be significantly higher.

**UK:** The Labour party will abstain in a vote on England's new coronavirus tier system on Tuesday over a disagreement on support for the hospitality sector.

**Italy:** Italy's new virus cases on Monday were the lowest in five weeks. The country reported 16,377 daily cases, compared with 20,648 on Sunday. The country's total virus deaths surpassed 55,000 on Monday, with 672 daily fatalities, compared with 541 the day before.

### **Vaccine news**

**Serbia:** Serbia is to start tests of Russia's Sputnik V vaccine, as it continues talks with Pfizer about purchasing its jab. Laboratories will get 20 doses this week for testing, according to a statement from the country's prime minister, Ana Brnabić.

**US:** Vice President Mike Pence told governors on Monday that distribution of a coronavirus vaccine could begin by the third week of December, signalling that US regulators will swiftly approve an emergency authorization for the first shots. Moderna Inc. requested clearance for its coronavirus vaccine in the US after a new analysis showed the vaccine was highly effective in preventing Covid-19, with no serious safety problems.

### **Lockdown updates**

**Colombia:** Colombia will keep its land and river borders closed until 16 January in an attempt to stem Covid's spread.

**Hong Kong:** Hong Kong has set up a hotline for the public to report suspected violations of social distancing orders on private yachts, Chief Executive Carrie Lam said at a briefing. Enforcement authorities will also step up scrutiny of junk boat parties.

**US:** California is considering a return to stay-at-home orders as hospitalizations from the coronavirus soar, with projections showing that intensive-care demand will exceed capacity in the next month.



New Jersey Governor Phil Murphy will toughen the limit on outdoor gatherings to 25 people from 150 and halt indoor high school sports for the rest of 2020 after reporting more than 28,000 new Covid-19 cases in the past week, according to a person familiar with the decision.

**Turkey:** Turkish President Recep Tayyip Erdogan announced a nationwide weekday curfew starting at 9 pm and ending at 5 am as the country copes with about 30,000 new cases per day. On the weekend, the curfew is stricter, running from 9 pm Friday to 5 am on Monday.

**Philippines:** Philippine President Rodrigo Duterte extended the existing movement restrictions in the capital region through year-end, while keeping most of the country under the most lenient status. The capital Metro Manila and Davao City, which is the main economic center on the island of Mindanao, are among the few areas placed under the so-called general community quarantine status.

**Malaysia:** Malaysia will extend its movement control order on Top Glove Corp.'s worker dormitories in Klang for 14 days because of rising coronavirus cases. The order had been due to end Monday. The government last week ordered Top Glove to close 28 of its factories in phases, after its Klang facility recorded 1,067 Covid-19 cases out of 1,884 new daily cases in Malaysia.

### **Economy updates**

**Global:** Opec will hold a second day of talks on Tuesday, as the oil producers' club hopes to reach an agreement over cuts to production. Demand has been affected by the pandemic, with the current Opec president, Abdelmadjid Attar, saying it had caused "immense challenges". Rating agency Moody's has said that most countries still face a "significant negative shock" from the pandemic, and vaccine trials have not caused it to change its forecasts.

**US:** Federal Reserve Chair Jerome Powell is cautioning lawmakers that the US economy remains in a damaged and uncertain state, despite progress made in the development of Covid-19 vaccines.

**Philippines:** The Philippines is looking at subsidizing coronavirus tests for tourists to boost its pandemic-battered tourism industry that's gradually reopening to domestic travelers, Tourism Secretary Bernadette Romulo-Puyat said in an interview with ABS-CBN News Channel on Tuesday. Travel vouchers for the subsidized tests from state-run Philippine General Hospital in Manila will be given to tourists, she said, without elaborating who can qualify.



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