

The Guardian



Air pollution linked to far higher Covid-19 death rates, study finds

Dirty air increases risk of respiratory problems that can be fatal for coronavirus patients

Coronavirus – latest updates
See all our coronavirus coverage

Damian Carrington *Environment editor*

Tue 7 Apr 2020 17.16 BST

Air pollution is linked to significantly higher rates of death in people with

Covid-19, according to analysis.

The work shows that even a tiny, single-unit increase in particle pollution levels in the years before the pandemic is associated with a 15% increase in the death rate. The research, done in the US, calculates that slightly cleaner air in Manhattan in the past could have saved hundreds of lives.

Given the large differences in toxic air levels across countries, the research suggests people in polluted areas are far more likely to die from the coronavirus than those living in cleaner areas. The scientists said dirty air was already known to increase the risk of acute respiratory distress syndrome, which is extremely deadly and a cause of Covid-19-related deaths, as well as other respiratory and heart problems.

A separate report from scientists in Italy notes that the high death rates seen in the north of the country correlate with the highest levels of air pollution.

The scientists said their findings could be used to ensure that areas with high levels of air pollution take extra precautions to slow the spread of the virus and deploy extra resources to deal with the outbreak. Air pollution has already fallen because of widespread lockdowns, but the scientists said ensuring cleaner air in the future would help reduce Covid-19 deaths.

The study, by researchers at the Harvard TH Chan School of Public Health in Boston, analysed air pollution and Covid-19 deaths up to 4 April in 3,000 US counties, covering 98% of the population. "We found that an increase of only $1\mu\text{g}/\text{m}^3$ in PM2.5 [particles] is associated with a 15% increase in the Covid-19 death rate," the team concluded.

A small increase in exposure to particle pollution over 15-20 years was already known to increase the risk of death from all causes, but the new work shows this increase is 20 times higher for Covid-19 deaths.

"The results are statistically significant and robust," they said. The study took account of a range of factors, including poverty levels, smoking,

obesity, and the number of Covid-19 tests and hospital beds available. They also assessed the effect of removing from the analysis both New York City, which has had many cases, and counties with fewer than 10 confirmed Covid-19 cases.

“Previous work showed that air pollution exposure dramatically increased the risk of death from [the] Sars [coronavirus] during the 2003 outbreak,” said Rachel Nethery, one of the Harvard team. “So we think our results here are consistent with those findings.”

Xiao Wu, a fellow team member, said: “This information can help us prepare by encouraging populations [with high pollution exposure] to take extra precautions and allocate extra resources to reduce the risk of poor outcomes from Covid-19. It is likely that Covid-19 will be a part of our lives for quite a long time, despite our hope for a vaccine or treatment. In light of this, we should consider additional measures to protect ourselves from pollution exposure to reduce the Covid-19 death toll.”

The authors said the results highlighted the need to keep enforcing existing air pollution regulations, and that failure to do so could potentially increase the Covid-19 death toll. They noted that the US Environmental Protection Agency suspended its enforcement of environmental laws on 26 March.

The study is being fast-tracked for publication in a major medical journal.

Prof Jonathan Griggs, from Queen Mary University of London, said the study was methodologically sound and plausible, but had some limitations, for example, important factors such as smoking were not measured at the individual level.

“Clearly, we urgently need more studies, since locally generated particle pollution will bounce back once the lockdown is eased,” he said.

The US has the third highest death toll to date, after Italy and Spain. A second study focusing on Italy, published in the journal *Environmental*

Pollution, said: “We conclude that the high level of pollution in northern Italy should be considered an additional co-factor of the high level of lethality recorded in that area.”

It noted that northern Italy was one of Europe’s most polluted areas and that the death rate reported up to 21 March in the northern Lombardy and Emilia-Romagna regions was about 12%, compared with 4.5% in the rest of Italy.

“It is well known that pollution impairs the first line of defence of upper airways, namely cilia, thus a subject living in an area with high levels of pollutant is more prone to develop chronic respiratory conditions and [is more vulnerable] to any infective agent,” it said.

Medical scientists warned in mid-March that air pollution exposure could make Covid-19 worse. Early research on Covid-19 had suggested that the weakened lungs of smokers and former smokers made them more susceptible to the virus.

While lockdowns have caused air pollution to fall dramatically, a comprehensive global review published in 2019 found that over long periods air pollution may be damaging every organ and virtually every cell in the human body.

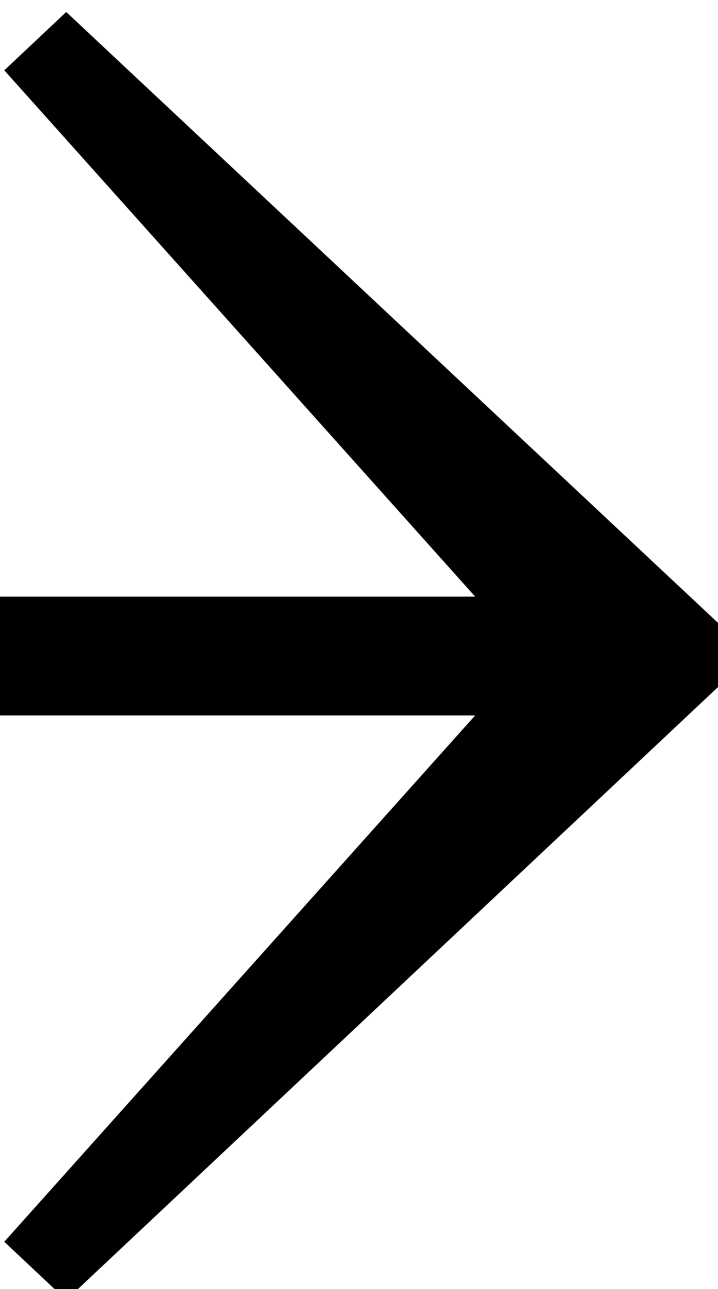
Since you're here...

The Guardian will engage with the most critical issues of our time – from the escalating climate catastrophe to widespread inequality to the influence of big tech on our lives. At a time when factual information is a necessity, we believe that each of us, around the world, deserves access to accurate reporting with integrity at its heart.

Our editorial independence means we set our own agenda and voice our own opinions. Guardian journalism is free from commercial and political bias and not influenced by billionaire owners or shareholders. This means we can give a voice to those less heard, explore where others turn away, and rigorously challenge those in power.

We hope you will consider supporting us today. We need your support to keep delivering quality journalism that's open and independent. Every reader contribution, however big or small, is so valuable. **Support The Guardian from as little as £1 – and it only takes a minute. Thank you.**

Support The Guardian



Topics

- Air pollution
- Coronavirus outbreak
- Infectious diseases
- Medical research
- Microbiology
- Biology
- Italy

- news

Bushfire sends PM2.5 level to record high

bangkokpost.com/thailand/general/1887220/bushfire-sends-pm2-5-level-to-record-high



A bushfire ravages Doi Suthep-Pui National Park in Chiang Mai's Hang Dong district on Wednesday night. Local officials and soldiers spent more than 14 hours bringing it under control. Chiang Mai Volunteer Drone Team

Prime Minister Prayut Chan-o-cha on Thursday expressed concern over massive damage caused by a bushfire in Doi Suthep-Pui National Park in Chiang Mai, which also sent air pollution in the northern province to record highs.

Although the blaze -- which broke out on Wednesday evening -- has been brought under control, the damage it left behind is extensive, Chiang Mai governor, Charoenrit Sanguansat, said on Thursday.

He added that the bushfire also sent PM2.5 levels in the area to "record levels" of around **1,000 microgrammes per cubic metre** ($\mu\text{g}/\text{m}^3$), 20 times above levels considered safe by the Pollution Control Department (PCD).

Mr Charoenrit said that almost 500 local officials and soldiers from the 3rd Army Region were called in to fight the blaze.

They spent more than 14 hours bringing the bushfire under control, he said.

- [Chiang Mai air pollution hits dangerous levels](#)
- [Chiang Mai air pollution hits dire levels](#)

- Smog continues to blanket the North

In Bangkok, government spokeswoman Narumon Pinyosinwat said the prime minister was gravely concerned by the fire in Doi Suthep-Pui National Park, and ordered related agencies under the Interior Ministry to work with the Royal Thai Army to put out the rest of the blaze. He also ordered helicopters to assist with the mission.

"[Gen Prayut's] primary concern is the health of the elderly and children, and he asked them to avoid going outside because of the smoke," she said.

Chiang Mai was not the only northern province plagued with air pollution issues, with many others registering PM2.5 levels above 50µg/m³.

The PCD's latest PM2.5 dust index also revealed severely unhealthy levels of air pollution in Chiang Rai, Mae Hong Son and Nan on Thursday. Unhealthy readings were also reported by air quality monitoring stations in Lampang, Lamphun, Phrae, Phayao, Tak and Kamphaeng Phet.

Pralong Dumrongthai, PCD director-general, said based on the most recent satellite imagery, the number of hotspots in the North is likely to decrease. At present, there are 377 and 364 hotspots in and around Chiang Mai and Mae Hong Son, respectively.

Mr Pralong said the air pollution in the North can partly be blamed on fires across the border, and the government is working with Myanmar to help address the issue.

Meanwhile in Phayao, villagers and park officials took 15 hours to put out a bushfire in Phu Sang National Park, said park chief Bantnom Somsuwan on Thursday.

Chiang Mai air pollution hits dire levels

 [bangkokpost.com/thailand/general/1886415](https://www.bangkokpost.com/thailand/general/1886415)

Chiang Mai province was hit by unprecedented levels of air pollution on Wednesday as intensifying forest fires sent PM2.5 levels in some areas up to 592 microgrammes per cubic metre (ug/m³) of air, almost 12 times above safe levels.

The level of PM2.5 -- fine dust that can get lodged in lungs and cause coronary disease -- rose to 592 ug/m³ at Chiang Mai University's Mae Hia Campus in Muang district, and at 321 ug/m³ at a school in Hang Dong district, according to data from Chiang Mai University's Climate Change Data Centres (CMU-CCDC), the most popular air-monitoring network used by locals.

The CMC-CCDC network gathers air-quality data from air-monitoring kits set up at community level across the North. This system provides real-time air-pollution measures as it is close to the pollution source, while the air-monitoring system run by the Pollution Control Department (PCD) provides a general average over 24 hours.

Thailand's safe threshold for PM2.5 stands at 50 ug/m³, while the World Health Organisation's is set it at 25 ug/m³.

Komsan Suwan-ampa, deputy governor of Chiang Mai province, said that though forest fires have been a chronic problem for more than a decade, this year's situation was dire because fires had erupted in areas that are not accessible by firefighters and volunteers.

- [Chiang Mai air pollution hits dangerous levels](#)
- [Chiang Mai appeals for bushfire support](#)
- [Chiang Mai air pollution worst in the world](#)

A fire erupted yesterday in Doi Suthep-Pui National Park in Hang Dong district, which had to be doused by helicopters, Mr Komsan said. Meanwhile, the fire-control centre reported that 218 hotspots in 18 districts in Chiang Mai have been detected by the Geo-Informatics and Space Technology Development Agency (GISTDA).

Pralong Dumrongthai, director-general of the PCD, said that as forest fire hotspots in the North continue rising due to arson, open burning and pollution from bush fires set in neighbour countries, PM2.5 and PM10 particles will continue polluting the air. He added that six pollution control stations detected severely hazardous levels in their areas.

Known for providing conservative readings, even the PCD air-monitoring system showed alarming pollution levels yesterday. For instance, the PM2.5 level in Doi Suthep area was measured at 234 ug/m³ and was 212 ug/m³ in Chiang Dao district.

Mr Pralong blamed the pollution on the lack of humidity and poor ventilation, adding the major culprits were still arsonists and open burning.

The authorities are offering a 5,000 baht bounty and imposing such as 1 to 30 years in prison and fines of 10,000 to 3 million baht for the crimes.

Chiang Mai air pollution hits dangerous levels

[bangkokpost.com/learning/easy/1886950/chiang-mai-air-pollution-hits-dangerous-levels](https://www.bangkokpost.com/learning/easy/1886950/chiang-mai-air-pollution-hits-dangerous-levels)



Chiang Mai province was hit by unprecedented levels of air pollution on Wednesday as intensifying forest fires sent PM2.5 levels in some areas up to 592, almost 12 times above safe levels.

The level of PM2.5 rose to 592 microgrammes per cubic metre (ug/m³) of air at Chiang Mai University's Mae Hia Campus in Muang district, and at 321 ug/m³ at a school in Hang Dong district, according to data from Chiang Mai University's Climate Change Data Centres (CMU-CCDC), the most popular air-monitoring network used by locals.

Thailand's safe threshold for PM2.5 stands at 50 ug/m³, while the World Health Organisation's is set it at 25 ug/m³.

Komsan Suwan-ampa, deputy governor of Chiang Mai province, said that though forest fires have been a chronic problem for more than a decade, this year's situation was dire because fires had started in areas that are not accessible by firefighters and volunteers.

A fire started yesterday in Doi Suthep-Pui National Park in Hang Dong district, which had to be doused by helicopters, Mr Komsan said. Meanwhile, the fire-control centre reported that 218 hotspots in 18 districts in Chiang Mai have been detected.

Pralong Dumrongthai, director-general of the PCD, said that as forest fire hotspots in the North continue rising due to arson, open burning and pollution from bush fires set in neighbour countries, PM2.5 and PM10 particles will continue polluting the air. He added that six pollution control stations detected severely hazardous levels in their areas.

The authorities are offering a 5,000 baht bounty and imposing punishments such as 1 to 30 years in prison and fines of 10,000 to 3 million baht for the crimes.

Vocabulary:

accessible : that can be reached, entered, used, seen, etc - ที่สามารถเข้าได้

arson : the illegal use of fire to destroy a house, building, or property; an arsonist is a person who commits arson - การลอบวางเพลิง

bounty : money given as a reward, of for helping catch or kill a criminal - เงินรางวัล

chronic (adj): (of a disease, pain or problem) serious and lasting for a long time - เป็นประจำ

dire : very serious or extreme - เลวร้ายมาก

douse : to make a fire stop burning by pouring water over it or to end a conflict - สาดน้ำหรือของเหลว, จุ่มในของ

hazardous : dangerous, especially to people's health or safety - ที่เป็นอันตราย

PM2.5 (n): atmospheric particulate matter (PM) with a diameter of less than 2.5 micrometres, which is about 3% the diameter of a human hair. It can lodge in the lungs and enter blood vessels, leading to respiratory and cardiovascular disease -

threshold : the level or point at which you start to experience something, or at which something starts to happen - จุดเริ่มของประสบการณ์หรือเหตุการณ์ใหม่ๆ

TAGS

[levels air pollution forest fires air](#)

RELATED STORIES

- [Emergency decree coming Thursday](#)
- [Chiang Mai appeals for bushfire support](#)
- [Haze hits Chiang Mai, Chiang Rai](#)





Most Viewed

- [Thailand must choose: Italy or ...](#)
- [Thousands leave Bangkok](#)
- [Woman caught virus in Bangkok pub, ...](#)
- [Emergency decree starts at midnight ...](#)
- [Government to declare emergency](#)

Recent LEARNING Articles



- [Anutin criticises 'careless' health personnel, apologises again](#)



- Thursday: 111 new Covid cases, total 1,045



- 357 checkpoints monitoring travellers nationwide