

Episodes 55 N thru Q

Episode 55N March 13, 2023

South America, Chile

RAWSEP brief view: A research study from Chile shows that wood burning causes Air Pollution in Chilean winter in Chilean areas where wood burning is still legal, and other factors such as weather cause the majority of Air Pollution in Chilean summer in Chilean areas where residential wood burning is illegal. The authors argue that O P measurement should be used for an Air quality indicator that indicates levels harmful to human health, in addition to the PM measurement currently used for AQI (the Air Quality Index) warnings to the public. RAWSEP concludes that one air quality management tool could be laws and enforcement of laws against residential wood burning.

South America, Chile

RAWSEP Analysis of “The oxidative potential of airborne particulate matter in two urban areas of Chile: More than meets the eye”

“The O P of P M in Santiago and Chillan, Chile” argues that 2 scientific measurements, O P and PM should both be used to more realistically depict the Air Quality of Chilean cities, and both O P and P M should be used as a template for all cities for the Air Quality Index (AQI). This article proves that in Chillan, Chile, residential human caused (anthropocentric) seasonal decline in air quality is primarily caused by residential wood burning (wood burning emits 90% PM_{2.5}) in the winter in Chillan, Chile. This article proves that in Santiago, Chile, summer weather (a meteorological variable of more sunshine) caused decline in air quality primarily caused by phytochemical interaction of large particulate matter (not primarily PM_{2.5}) with more sunshine in the summer in Santiago, Chile. Wood burning is legal in Chillan, Chile. Wood burning is illegal in Santiago, Chile. The two measurements of Air Quality used for this study are 1) (P M) Particulate Matter (including PM_{2.5} particulates found in the air of 2.5 micrometer size. Wood smoke is 90% PM_{2.5}), and 2) (O P) Oxidative Potential which uses one of two types of O P measurements, 2a) DTTm, measurement of particulates which measures particulates which happen to be two-thirds PM_{2.5}. (The M in DTTm stands for the total particulate Mass) and 2 b) DTTv, (the V in DTTv stands for the total particulate Volume). Using both O P (both DTTm and DTTv) and PM will more realistically find if air pollution exists in a city which is at a limit proved by research to be harmful to human health. The measurement O P DTTm shows that from wood burning in Chillan, Chile in the winter months (in Chile, in the southern hemisphere, winter occurs in May, June and July, the opposite of the northern hemisphere) there are seasonal high levels of O P using the measurement DTTm in the winter months, where in Chillan, Chile, wood burning is legal, and used for heat. In Chillan, Chile wood burning for heat is NOT illegal. In the second urban area of this study, the capital city of Chile, which is Santiago, wood burning is illegal. In Santiago, the 2nd O P measurement, called DTTv. (V stands for the total volume of particulates), is higher in summer (summer is November, December and January in Chile’s southern hemisphere). The PM measured in Santiago is larger molecules of PM, PM₁₀, (of 10 micrometer size). Weather causes higher OP DTTv when summer sunshine creates greater phytochemical reactions in the atmosphere, and Santiago’s PM₁₀ measurements go higher in summer for that reason. In Santiago wood burning is illegal, so that anthropocentric (human-caused) reason for pollution is not as significant in creating OP and PM pollution in Santiago. Residential wood burning is significant using the measurements for PM_{2.5} and OP DTTm in winter in Chillan, Chile.

As the study itself concludes (Chillan, Chile is labeled C H I and Santiago, Chile is labeled S T G) “The spatial–temporal variability of OP can be explained by the emissions at the study sites and the meteorological variables. In CHI (Chillan), emissions from wood burning during cold months explains the variability in the DTTm and DTTv values. In STG (Santiago), where wood burning is banned, the increase in PM concentrations is dominated by meteorological variables.” RAWSEP concludes that one air quality management tool could be laws and enforcement of laws against residential wood burning.

The oxidative potential of airborne particulate matter in two urban areas of Chile: More than meets the eye.

https://www.sciencedirect.com/science/article/pii/S0160412023001393?fbclid=IwAR0UGErK20S086AyNgB-HDTjc960upViGIE0i23I_0GDCs5vU5s7qHdctNO

The oxidative potential of airborne particulate matter in two urban areas of Chile: More than meets the eye
Author links. open overlay panel. Carolina Molina a, Carlos A. Manzano a b, Richard Toro A. a, Manuel A. Leiva G a
<https://doi.org/10.1016/j.envint.2023.107866>Get rights and content
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Highlights

Seasonality was observed in the estimated OP mass normalized. Higher OP normalized by volume was observed when wood burning emission increased. Air Quality Index showed a low correlation with the OP mass normalized. Even PM low mass concentration has high OP. Even PM low mass concentration, it may still be harmful to human health.

Abstract

Oxidative potential (OP) has gained attention as a parameter that can reveal the ability of different properties of particulate matter (PM) to generate reactive oxygen species (ROS) as one single value. Moreover, OP is also believed to be a predictor of toxicity and hence the health effects of PM. This study evaluated the OP of PM₁₀, PM_{2.5}, and PM_{1.0} samples using dithiothreitol assays in two cities of Chile (Santiago and Chillán). The results showed that the OP was different between cities, PM size fractions, and seasons. Additionally, OP was strongly correlated with certain metals and meteorological variables. Higher mass-normalized OP was observed during cold periods in Chillán and warm periods in Santiago and was associated with PM_{2.5} and PM_{1.0}. On the other hand, volume-normalized OP was higher during winter in both cities and for PM₁₀. Additionally, we compared the OP values to the Air Quality Index (AQI) scale and found cases of days that were classified as having “good” air quality (supposed to be less harmful to health) showing extremely high OP values that were similar to those on days that were classified as “unhealthy”. Based on these results, we suggest using the OP as a complementary measure to the PM mass concentration because it includes important new information related to PM properties and compositions that could help improve current air quality management tools.

4. Conclusions

We present the first full-year study of aerosol OP in two Chilean cities for three different PM fractions, PM₁₀, PM_{2.5}, and PM_{1.0} (which has been previously studied in only a few studies), and its relation to the chemical properties of PM and meteorological variables.

The spatial–temporal variability of OP can be explained by the emissions at the study sites and the meteorological variables. In CHI, emissions from wood burning during cold months explains the variability in the DTT_m and DTT_v values. In STG, where wood burning is banned, the increase in PM concentrations is dominated by meteorological variables. Thus, higher DTT_v values were measured in winter, controlled by the reduced dispersion of pollutants. DTT_m was higher in summer when the concentration of ozone and radiation increased at the sites. Those changes were also observed in the PM fractions, with PM_{1.0} and PM_{2.5} showing higher DTT_m values than did PM₁₀ and no differences in DTT_v in CHI even when larger particles were at higher mass concentrations.

Episode 55 O

RAWSEP View: Chile historically has a wood burning pollution problem. See three journal articles, from 2021, 2018, and 2017, below.

Chile, the cities of Molina and Valdivia, 2021

[Wood burning pollution in Chile: A tale of two mid-size cities](#)

[ScienceDirect](#)

<https://www.sciencedirect.com › science › article › pii>

2021 · Cited by 3 — Two mid-size cities in southern *Chile*: Molina and Valdivia, have been suffering high levels of ambient PM_{2.5} because of residential *wood burning* for years. This ...

Abstract

Cities in southern Chile are facing high levels of PM_{2.5} because of wood burning pollution. We quantify the contribution of wood smoke to fine particles in two mid-size cities: Molina and Valdivia, located in different climate zones. The

sampling campaigns were carried out during austral winter (July to September) in 2018 (Molina) and 2019 (Valdivia). Average winter concentrations of PM_{2.5} were 53 micrograms per meter cubed in Molina and 89 in Valdivia. The major component was 70% PM_{2.5}, particulates of 2.5 micrometer size. The major source of PM_{2.5} was wood smoke, which accounted for 41% in Molina and 43% in Valdivia. Secondary organic aerosols (SOA's) generated from inefficient wood burning, contributed 20% in Molina and 29% in Valdivia. Secondary inorganic ions and dust are minor sources of PM_{2.5}. The total contribution of wood smoke (adding primary wood smoke and SOA) could be as much as 83% in Molina and 81% in Valdivia, during the winter season.

Chile, smothered by wood burning cookstoves and heaters, 2018

RAWSEP View: The primary (PM_{2.5} pollution) culprit in Coyhaique is simple: wood heating. In Santiago, 200,000 wood-burning stoves were replaced with cleaner-burning paraffin or wood-pellet heaters. In Coyhaique, a few residences upgrade from wet wood to a combination of wood pellet, paraffin, and gas. RAWSEP's view is that these half-measures are a poor substitute for the real solution, ending residential wood burning across Chile.

[In Chile, Bounded by Mountains and Smothered by Wood ...](#)

[Pulitzer Center](#)

<https://pulitzercenter.org/stories/chile-bounded-mo...>

Dec 10, 2018 — Much of that indoor particulate pollution, including in *Chile*, can be tied directly to *wood-burning* cook stoves and heaters.

In Chile, Bounded by Mountains and Smothered by Wood Smoke

Project

[Breathtaking: Gasping for Air Across the Globe](#)

Excerpt, edited by RAWSEP for brevity and clarity

A ten year old girl has severe asthma and most trips outside her home in the town of Coyhaique involve wearing a mask, or even a respirator. Natalie had her first asthma episode when she was 4 years old. Now 10, she wears a mask at all times outdoors, and must inhale steroids twice a day to control asthma attacks. Natalie's mother is among the small but growing number of local residents who have transitioned away from wood. [pilot projects](#) are exploring other ways to bring alternative heating and cooking fuels to the wood-dependent community of Coyhaique.

COYHAIQUE, Chile

ON A MIDWINTER Saturday a 22-year-old mother of two sat in the waiting room of the public hospital in Coyhaique. Her two months old son had a respiratory infection that kept him in intensive care for a week. "All of this must be because of pollution," the child's mother lamented.

Coyhaique, a city of 60,000 people in southern Chile, was promoted as a pristine natural reserve, but today the air in Coyhaique is considered to be the most polluted in South America. On certain days and at some specific hours, it can be among the most polluted cities in the world. A study at the University of Santiago (USACH) in May of 2016 established that Coyhaique sees hourly concentrations of PM 2.5, particulates in the air of 2.5 micrometer size, higher than Beijing, although the Chinese capital has higher annual concentrations. The impacts are real, and nobody expected this from tranquil Coyhaique. Officials had thought of using Coyhaique as a "control city, to show how this supposedly clean Patagonian city compared to cities like Santiago. As it stands, Coyhaique sees annual average PM_{2.5} concentrations of about 64 micrograms per cubic meter, well above global standards considered safe. At certain times of the year, levels can double, or even triple. The primary culprit in Coyhaique is simple: **wood heating**. 1,200 miles from the Antarctic, temperatures in the region can drop below 0 degrees Fahrenheit during the winter, and wood, plentiful and less expensive than other options, is used in 96 percent of the homes. Most homes and businesses in Coyhaique are heated with wood in stoves that cause high levels of PM 2.5, both indoors and outdoors. Efforts to curb wood-use have run up against both economic and cultural resistance, but the public health impacts are real. The pollution is inescapable,

swirling in clouds hanging heavy over the valley, and hovering in the air indoors. Exposure to household air pollution was responsible for as many as 2.6 million deaths worldwide in 2016. Much of that indoor particulate pollution, including in Chile, can be tied directly to **wood-burning cook stoves and heaters**. “The most serious problem here is pollution and how that affects public health” “Last year, we had several dozen children transferred to [hospitals] in other Chilean regions, mostly due to bronchopulmonary and respiratory diseases.” A politician’s own child was among them. “I worked hard to get a plane-ambulance to be able to transfer kids, because some of them died and several ended up with long-term physical damage.” In their most recent [State of Global Air analysis](#), the Institute for Health Metrics and Evaluation at the University of Washington in Seattle and the research nonprofit Health Effects Institute in Boston [estimated](#) that household air pollution was responsible for 2.6 million deaths worldwide in 2016, the eighth highest risk factor for early death globally. The United Nations (U N) Environment Program [estimates](#) that air pollution costs the Chilean health sector at least \$670 million annually, with 127,000 visits to emergency rooms and clinics, and 4,000 premature deaths annually. In 2017, a wood stove pollution outbreak sent hundreds of children to regional hospitals. “We have many children with long-lasting damage from Coyhaique’s pollution” said a pediatrician at Coyhaique Regional Hospital. Several mothers in Coyhaique organize public demonstrations to raise awareness, and to force politicians to take action. Natalie, daughter of one of the demonstrating mothers, had her first asthma episode when she was 4 years old. Now 10, she wears a mask at all times outdoors, and inhales steroids twice a day to control asthma attacks. Natalie’s mother is among the small but growing number of local residents who have **transitioned away from wood**. The home’s heating and cooking systems were upgraded from wet wood to a combination of wood pellet, paraffin, and gas. Natalie’s family enrolled in a pioneer governmental test program that provides them with an **indoor pollution monitor**. Such reform is slow but ongoing. [pilot projects](#) are exploring other ways to bring alternative heating and cooking fuels to the wood-dependent community. (Undark measured PM2.5 levels at more than 300 micrograms per cubic meter of air inside some residents’ homes — multiple times beyond what public health experts consider safe.)

SANTIAGO, Chile

In the north, Santiago has long battled its own air pollution problems. In the capital city, home to 5.6 million people, two decades ago, [air pollution was endemic](#). The federal government launched an ambitious program to replace 200,000 wood-burning stoves with cleaner-burning paraffin or wood-pellet heaters.

The move has helped nudge emissions of particulate matter down in many urban areas. The Chilean Ministry of the Environment [reported](#) a reduction in “severe air pollution episodes,” in major cities of the center-south Chile region by 45 percent from 2016 to 2017.

Episode 55 P

(Such episodes are also measured against Chile’s maximum daily standard of 50 micrograms of PM2.5 per cubic meter, compared to the WHO’s standard of 25 in 2016-2017. Santiago has also joined the [Breathe Life Campaign](#), a joint effort of the World Health Organization (W H O) and the United Nations (U N) aimed at uniting regions and cities to share best practices for curbing air pollution and to provide more widespread monitoring of air quality. This year’s comparatively harsh winter has only helped to increase reliance on wood burning. [Click here for the interactive graph composed of data from early 2017 to July 2018.](#)

COYHAIQUE

SUCH REALITIES, of severe pollution from wood burning, are familiar to outposts like Coyhaique. Many anti-pollution activists argue that Chile’s government is failing to both acknowledge and act upon the serious pollution issues facing many regions outside the capital. A Santiago-based lawmaker, doctor, and president of the Health Commission of the Chilean Senate says the persistently high PM2.5 levels, particularly in Chile’s southern communities, is an outrage. Daily PM2.5 levels in Coyhaique register at 700 micrograms per cubic meter, and “that is clearly a health emergency,” he said. “Those levels are reached not once but in a continuous and sustained fashion. “In Santiago, there is panic when levels reach 200,” he added, calling the situation in the south “ethically and socially” unacceptable. But there is resignation and helplessness in Coyhaique. Back in the public hospital, the mother of the two month old said “the air is really bad.” While she is supposed to ventilate the house, smoke then comes in from outside, suggesting that protecting the children of Coyhaique from air pollution had become a Sisyphean task.

Chile, Temuco, a city with a severe wood burning smoke pollution problem, 2017

[Wood burning pollution in southern Chile: PM2.5 source ...](#)

[National Institutes of Health \(.gov\)](#)

<https://pubmed.ncbi.nlm.nih.gov> › ...

by AM Villalobos · 2017 · Cited by 37 — Temuco is a mid-size city representative of severe *wood* smoke pollution in southern *Chile*; i.e., ambient 24-h PM 2.5 concentrations have

Abstract

Temuco is a mid-size city representative of severe wood smoke pollution in southern Chile, where ambient 24-hour PM_{2.5} concentrations have exceeded 150 micrograms per meter cubed in the winter season and the top concentration reached 372 in 2010. Annual PM_{2.5} is 30 micrograms per meter cubed. For the very first time, a molecular marker [source apportionment](#) of ambient [organic carbon](#) (OC) and PM_{2.5} was conducted in Temuco. Sources for PM_{2.5} were wood smoke 37%. Wood burning is responsible for 84.6% of the PM_{2.5} in Temuco. This predominance of wood smoke is ultimately due to widespread poverty and a lack of efficient household heating methods. The government has been implementing emission abatement policies but achieving compliance with ambient air quality standards for PM_{2.5} in southern Chile remains a challenge.

Conclusions

For the very first time, a molecular marker source apportionment of ambient OC and PM_{2.5} was conducted in Temuco, a mid-size city representative of serious wood smoke pollution in southern Chile. The Primary sources was wood smoke 37.5%

United States

RAWSEP View: Soot is PM2.5. Please comment to the E P A by 3/31/2023, requesting that the E P A lower PM2.5 safe limits to 8 micrograms per meter cubed annually and 25 micrograms per meter cubed daily.

The EPA's soot pollution update falls dangerously short for Latinos

<https://thehill.com/opinion/energy-environment/3894301-the-epas-soot-pollution-update-falls-dangerously-short-for-latinos/?fbclid=IwAR3CxTWpNVtJ-zgE40dsXy6SQcgwh6diEaOBa6umqQZQiV7NN5mhiHKkeqg>

The EPA's soot pollution update falls dangerously short for Latinos

Excerpt

On Jan. 6, the Environmental Protection Agency (EPA) [released a proposal](#) to strengthen the annual standards for fine particulate matter, commonly known as soot, from 12 ug/m³ to between 9 and 10 ug/m³, despite an overwhelming body of evidence showing that stronger limits are necessary to mitigate the decades of harm soot pollution has caused, particularly to the country's Latino population.

Due to its small size, soot can penetrate our lungs and bloodstream, causing devastating health impacts, including [premature death](#), [heart disease](#), [cancer](#) and [aggravated asthma](#), among others. It is one of the reasons the Latino population has a relatively high rate of asthma, with approximately [3.8 million American Latinos](#) grappling with — and in some cases dying from — the chronic lung disease.

Because [Latinos are overrepresented in occupations](#) where people work outside [such as agriculture, construction and landscaping](#), we are more vulnerable to outside air contamination, including unsafe levels of particulate matter pollution, or soot, which is a byproduct of fossil fuels and consists of minute particles [30 times smaller](#) than the width of a human hair.

People who suffer from asthma often describe an attack as like trying to breathe with a pillow covering their face. It is nothing short of terrifying, and Latinos in the United States are [twice as likely as](#) non-Latino white people to visit an emergency room due to such an episode. This health disparity, which also affects Black and Indigenous populations in

the United States, most gravely impacts the Latino community's younger members, who are 40 percent more likely than non-Latino white children to die from asthma. It is an environmental justice crisis.

United States

[Digital Nomad Transforms School Bus Into a Cabin-Like Home on Wheels - TechEBlog](#)

TechEBlog -... a stone wall, **wood-burning** stove, three burner gas stove, ... There's a small wet bath near the wood stove, while a roof patio lets you cool ...

Florida, Daytona

[Burning Bike goes down in flames in DeLand as Bike Week ends - Daytona Beach News-Journal](#)

Daytona Beach News-Journal

Burning Bike: Big wooden motorcycle goes up in flames for Bike Week ... messages swirling toward the heavens as the pieces of reclaimed wood burn.

Kansas, Topeka

[Topeka residents must have permit to burn wood on property - WIBW](#)

WIBW

"Anywhere in the City of Topeka where you are burning an kind of wood debris, you do need to have a residential burning permits," said Alan Stahl.

North Carolina, Winston-Salem

[Winston-Salem saw near record number of good air quality days in 2022, despite Weaver fire](#)

WFDD

Graph of good PM 2.5 pollution days. Minor Barnette, with Forsyth County, said particulate matter pollution quickly ...

Texas, Houston

[Houston among U.S. cities with worst air pollution, study finds, with minority areas hit the hardest](#)

Houston Chronicle

Houston neighborhoods that are hotspots for higher PM 2.5 emissions, including Fifth Ward, Third Ward and Bellaire.

Utah, Salt Lake City

[Here are the places where air pollution levels could soon be considered dangerous by the EPA](#)

The Desert Review

A majority of air pollution comes from burning fossil fuels like gasoline, diesel, oil, and wood. Tiny inhalable particle pollutants—just a ...

Canada

British Columbia, Kelowna

[Wildfire crews set to burn 200 piles of wood debris in Myra Bellevue Park - Kelowna Now](#)

Kelowna Now

A planned **burn** schedule for Myra Bellevue Provincial Park in Kelowna could begin as early as Monday. The BC Wildfire Service (BCWS) is conducti...

British Columbia, Okanagan

[200 wood piles to be burned in Central Okanagan provincial park - Global News](#)

Global News

The burning is part of the region's ongoing forest fuels management project, which reduces surface fuels.

Episode 55 Q

Australia, Perth, Kalamunda suburb

[Nature Reserves Preservation Group 'Bush Carers'](#)
[opdteSrsonM0al0ca7f7c2h6f0r1A8ft4mac7m c 6 utfg 0hM9808c:mg2](#) ·

The Nature Reserves Preservation Group of Kalamunda invites you to our Speaker Evening and AGM – all welcome!

Dr Phil Zylstra's work and evidence will transform your understanding of bushfires and how Prescribed burning is exacerbating the problem in our Southwest forests.

A/Prof. Phil Zylstra came into bushfire research from a background in fire management and remote area firefighting. His work since that time has seen him develop the first and only peer-reviewed fire behavior model for most Australian forests, as well as the first model globally to calculate the direct effects of fire on flora, fauna and soils. In his Adjunct role with Curtin University, he has turned his focus toward understanding the ways that our interaction with forests affects fire risk. Using new approaches to analyze fire histories alongside state-of-the-art modelling, Phil has pioneered an approach of “ecological cooperation” that reconciles deep knowledge from First Nations with forest ecology and a complex understanding of fire behavior to provide critically-needed guidance in fire management.

United Kingdom

U K, Leicester

[Clean fuel' banned from wood burning stoves in smoke control areas - Leicestershire Live](#)

Leicester Mercury

Coffee logs are a compact fire log made from recycled waste coffee grounds, perfect for burning in domestic wood burners and last around an hour each ...

[Freezing family spent eight months without glass in front door and window after raid by masked men](#)

Leicester Mercury

'Clean fuel' banned from **wood burning** stoves in smoke control areas ... up the window and front door with wood to temporarily replace the glass.

U K, Scotland

[PHOTOS: This Tiny Home in Scotland Looks Like a Submarine Tower - Business Insider](#)

Business Insider

A kitchen area with wooden cabinets, a small wooden table, ... A lounge area with armchairs, large windows, and a **wood-burning** stove. Nigel Rigden.

U K, Wales

[Health expert questions whether people with wood burners care about their polluting impacts](#)

Wales Online

The Welsh Government said burning dry, seasoned wood, especially when using a modern, efficient wood burner, emitted significantly less fine ... He says better information is needed to help people with wood burners make ... significantly less fine particulate matter than burning wet wood.

[Air quality expert warns of increasing pollution issue in Wales from wood burning](#)

Nation.Cymru

... especially when using a modern, efficient wood burner, emitted significantly less fine particulate matter than burning wet wood

Europe

Italy

[NASA and Italian Space Agency Join Forces to Monitor Air Pollution Worldwide | Weather.com](#)

The Weather Channel

... which found that more than 99% of the global population is exposed to unhealthy levels of tiny air pollutants called PM 2.

Asia

China, Beijing

[Beijing air quality plummets amid dust storm, pollution - Times of India](#)

Times of India

Concentrations of the tiny PM 2.5 particles that can reach deep into the lungs and bloodstream entered a dangerous range on air quality monitoring ...

India, Delhi

[What causes winter haze in Delhi? New research offers an answer - The Indian Express](#)

The Indian Express

Inefficient burning of biomass, like wood, leaves or stubble, in the ... Haze is caused by the suspension of such dry particulate matter which ...

India, Kochi

[Getting harder to breathe - nearly 200,000 people seek treatment for air pollution related ...](#)

The Star

From Jan 1 to March 5 this year, more than 1.3 million people have fallen sick due to air pollution, he said. "The level of **PM 2.5** is higher this year ...

[PCB stops measuring Kochi's air quality even as 'chemical cocktail' pervades city - Onmanorama](#)

Onmanorama

The meters at Vyttila could read the levels of **PM 2.5** (chemical air pollutants), PM 10 ... (PM denotes particulate matter or fine particles.).

[Is it mist? Is it fog? No, it's poisonous smoke - The Hans India](#)

The Hans India

These are carcinogenic pollutants. These dioxins and furans have the ability to cling on to dust particles, especially the **PM 2.5**. ♦ **PM 2.5** particles ...

India, Mumbai

[Mumbai's AQI data likely being tampered with, alleges scientist - Free Press Journal](#)

Free Press Journal

According to a report, a scientist alleged that over the past five years, data of PM 2.5 and PM 10 from majoritarian CAAQMS are being evidently ...

Thailand

[Nearly 200,000 people seek treatment for air pollution-related diseases in Thailand](#)

The Sun Daily

“The level of PM 2.5 is higher this year compared to last year (2022), partly because during the COVID-19 pandemic the number of passengers ...

[Nearly 2,00,000 hospitalized as Thailand chokes with air pollution | Mint](#)

Mint
Around 50 districts in Bangkok have recorded unsafe levels of **PM 2.5** particles. The particles are considered dangerous as they have the ...

PM2.5 and Health Effects (Wood Smoke is 90% PM2.5)

PM2.5 and Air Quality Monitors (Wood Smoke is 90% PM2.5)

[Air quality - how tech can monitor and clean your air - Yahoo](#)

Yahoo
Most air quality monitors measure particles with a width of 2.5 microns ... this top spec model scans for PM 2.5, CO2 and VOC while monitoring ...

PM2.5 and Childhood Hand, Foot and Mouth Disease (Wood Smoke is 90% PM2.5)

[Associations between ambient air pollutants and childhood hand, foot, and mouth disease in ...](#)

Nature
Daily data on childhood HFMD counts and meteorological and ambient air pollution (PM2.5, PM10, NO2, CO, O3, and SO2) concentrations in 21 cities ...

PM2.5 and Long Covid (Wood smoke is 90% PM2.5)

[Exposure to Air Pollution Linked to Risk of Long COVID in Young Adults | MedPage Today](#)

Medpage Today
For each increase in interquartile range (IQR) in exposure to particulate matter $\leq 2.5 \mu\text{m}$ (PM2.5) in 2019 (median annual exposure $6.39 \mu\text{g}/\text{m}^3$), ...

PM2.5 and Female newborn lower lung volume

<https://www.sciencedirect.com/science/article/abs/pii/S0013935123004486?fbclid=IwAR1z35rTcPEJaNKStR5a2T9TUUXI3j8ildF-wPRYNuC10moSQvQCU0XkUMU>

Pre-natal exposure to NO₂ and PM_{2.5} and newborn lung function: An approach based on repeated personal exposure measurements

In summary, we studied the association of newborn lung function indicators with personal pre-natal exposure of the mother to NO₂ and PM_{2.5} and pointed out that females, but not males, born to mothers with higher exposure to PM_{2.5} during pregnancy were at higher risk of lower lung volumes. While previous literature showed that air pollution exposure alters lung development, our results provide evidence that such effects can be initiated in utero, especially in females. These early impacts of PM