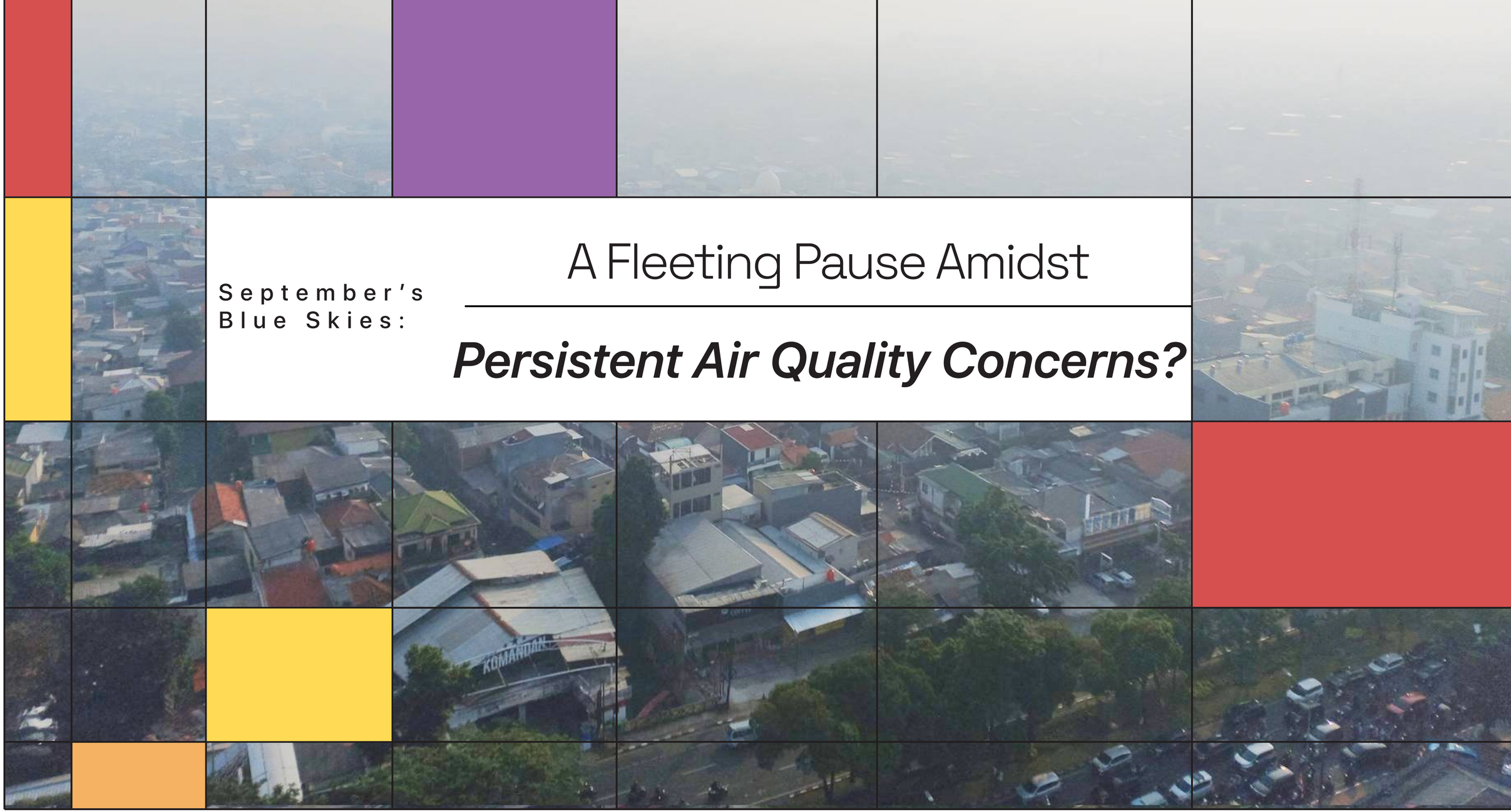
nafas



September's Blue Skies:

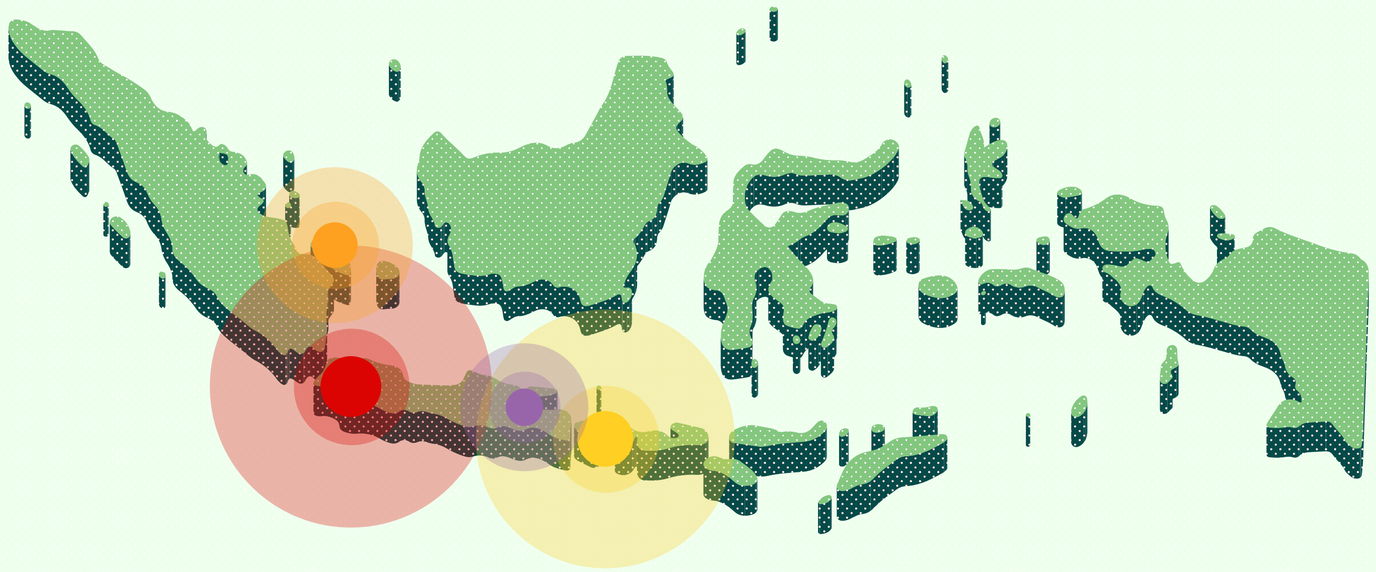
A Fleeting Pause Amidst *Persistent Air Quality Concerns?*

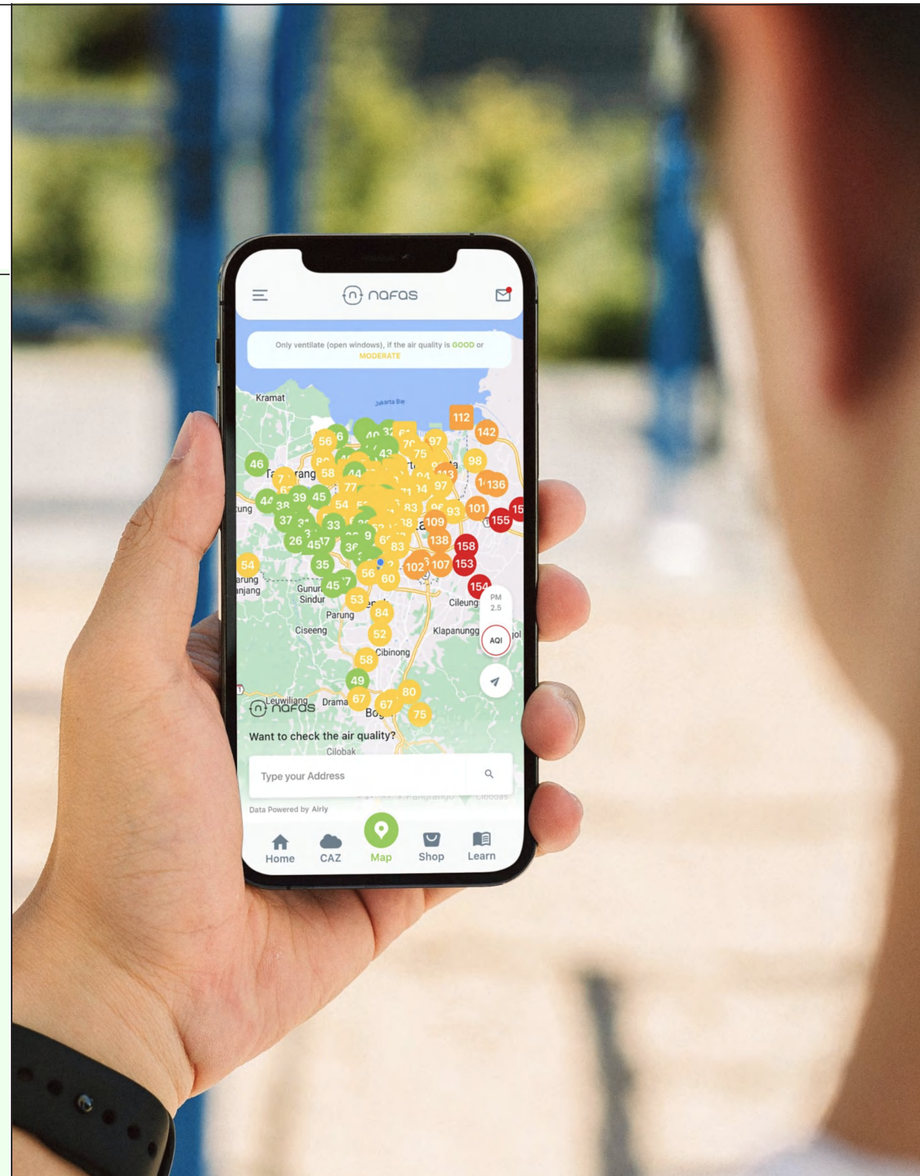
01

nafas & air quality

What is nafas?

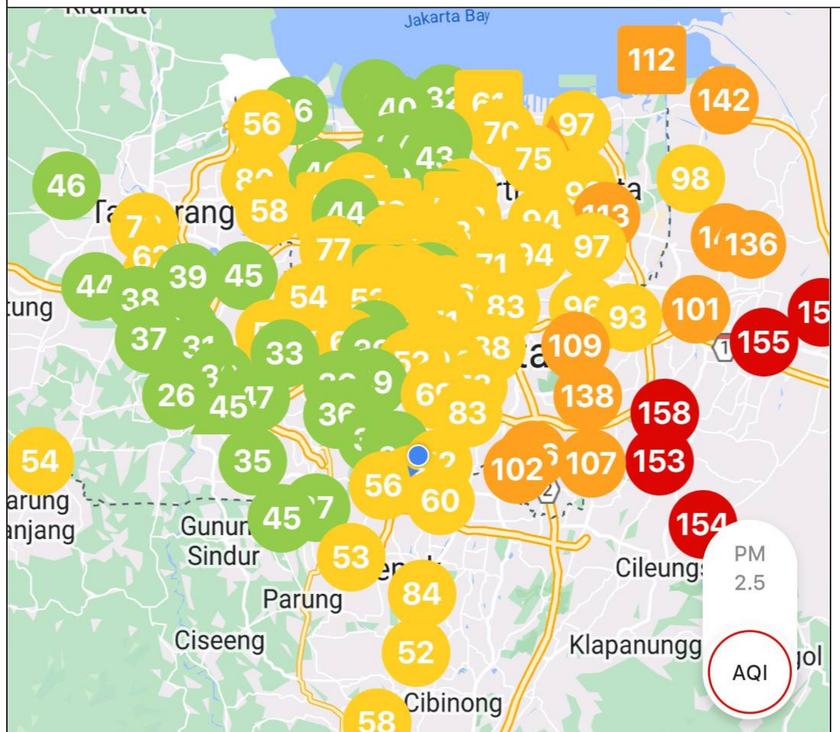
Nafas is an air quality health and wellness company, developing technologies to help urban citizen breathe healthier air

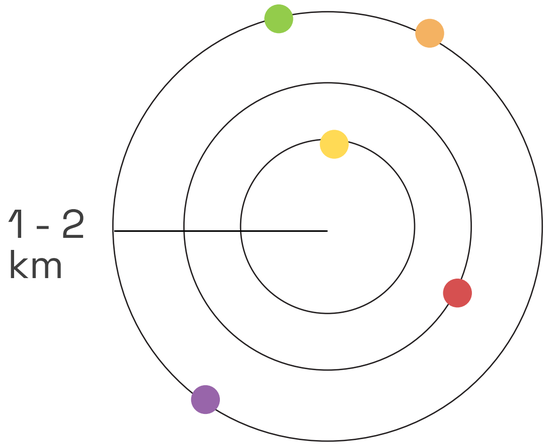




How does nafas the obtain air quality data?

Nafas obtains air quality data from low-cost sensors installed at over 180 locations on the ground. These sensors represent the air quality conditions within a radius of 1-2 km from each point. The data is received in real-time and can be accessed through the Nafas app.





How does nafas interpret the air quality data?

Nafas interprets air quality data using PM2.5 as the primary parameter, following the guidelines set by the US EPA. The results are measured in the unit µg/m³.

AIR QUALITY INDEX

The Air Quality Index, developed by the US EPA, provides a color-coded system to help us easily understand the quality of the air we breathe.

Baik	Moderat	Tidak Sehat untuk Kelompok Sensitif	Tidak Sehat	Sangat Tidak Sehat	Beracun
0 - 12	12.1 - 35.4	35.5 - 55.4	55.5 - 150.4	150.5 - 250.4	>250.4

What is PM2.5?

PM2.5 refers to air pollution particulate matter with a diameter of less than 2.5 micrometers. This size is about 36 times smaller than the diameter of a grain of sand.

Diameter dalam Satuan Mikrometer

<2,5 µm
PM2.5

<10 µm
PM10

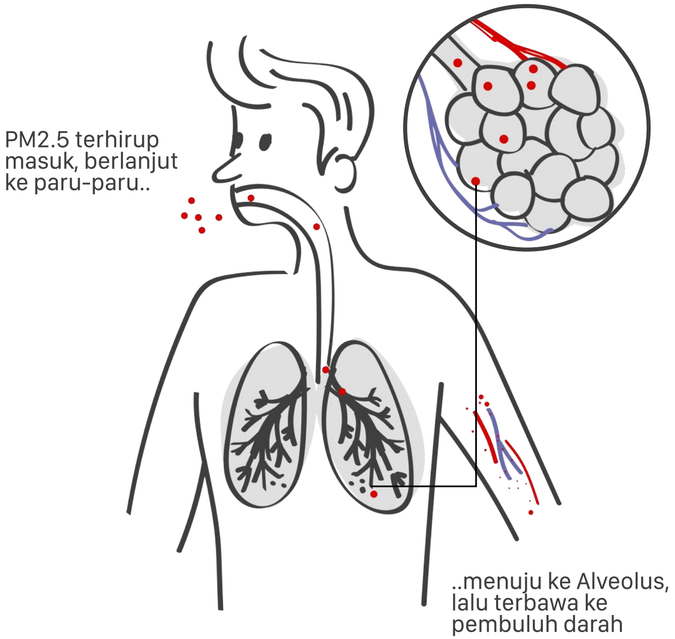
~90 µm
Sebutir Pasir Pantai

Partikel pembakaran
Senyawa organik
Logam

Debu
Serbuk sari
Jamur

WHY IS PM2.5 HAZARDOUS TO US?

Due to its microscopic size, PM2.5 particles cannot be effectively filtered by our body. Inhaling PM2.5 can lead to serious health issues, including **premature birth, asthma exacerbation, coughing, respiratory distress, coronary heart disease, diabetes, and even lung cancer.**



Sources of Air Pollution

A significant portion of air pollution results from human activities. What are these activities that emit pollutants?

How we mobile

How we produce

How we generate power

How we manage our waste

The nature can also be one of the sources

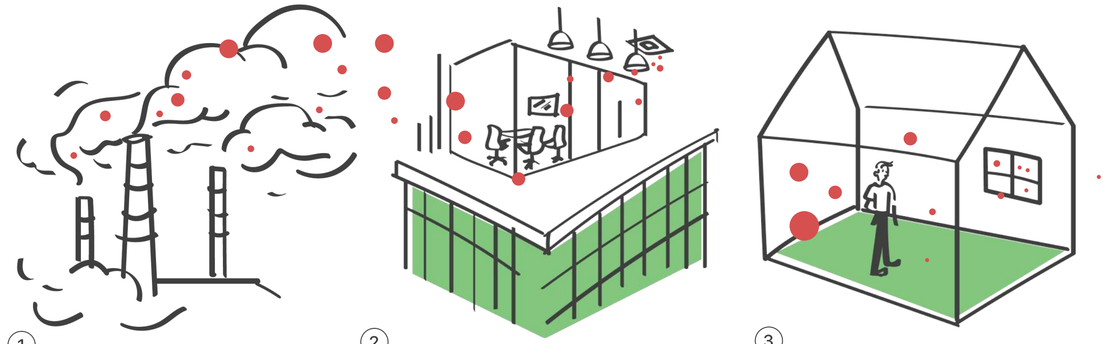
Properties of Air quality

HYPERLOCAL

CONTOH:

Air pollution can change rapidly, increasing when there are pollution sources in the vicinity and the atmospheric conditions are conducive to the buildup of pollutants.

TRANSBOUNDRY



1 POLUSI DARI ASAP CEROBONG PABRIK

2 TERBAWA ANGIN KE KOTA DAN MASUK KE DALAM GEDUNG

3 ..HINGGA KE PERUMAHAN

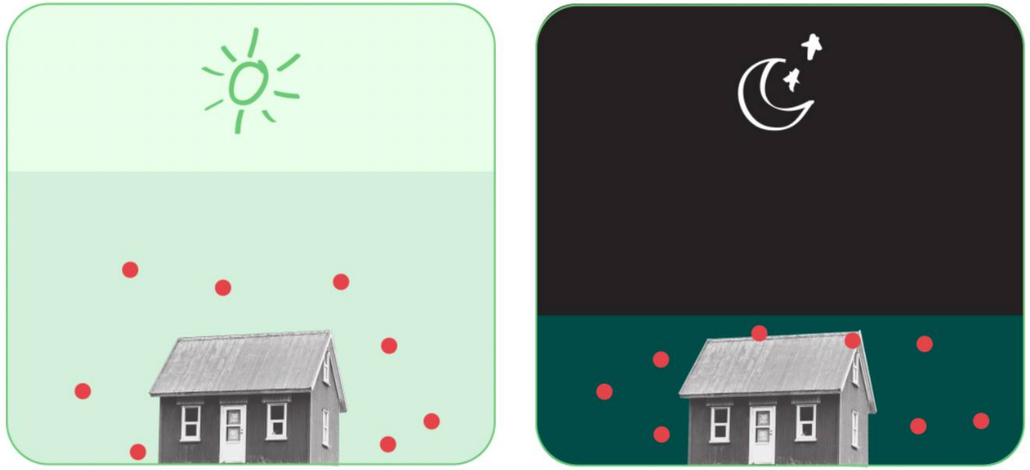
Wind can transport pollutants from their source, carrying them from one area to another, often crossing regional or national boundaries.

The Influence of Atmospheric Conditions on Air Quality

WIND AND RAIN

The direction and speed of the wind, coupled with rainfall, can either enhance air quality by dispersing pollutants or contribute to the decline of air quality by accumulating them.

PLANETARY BOUNDARY LAYER

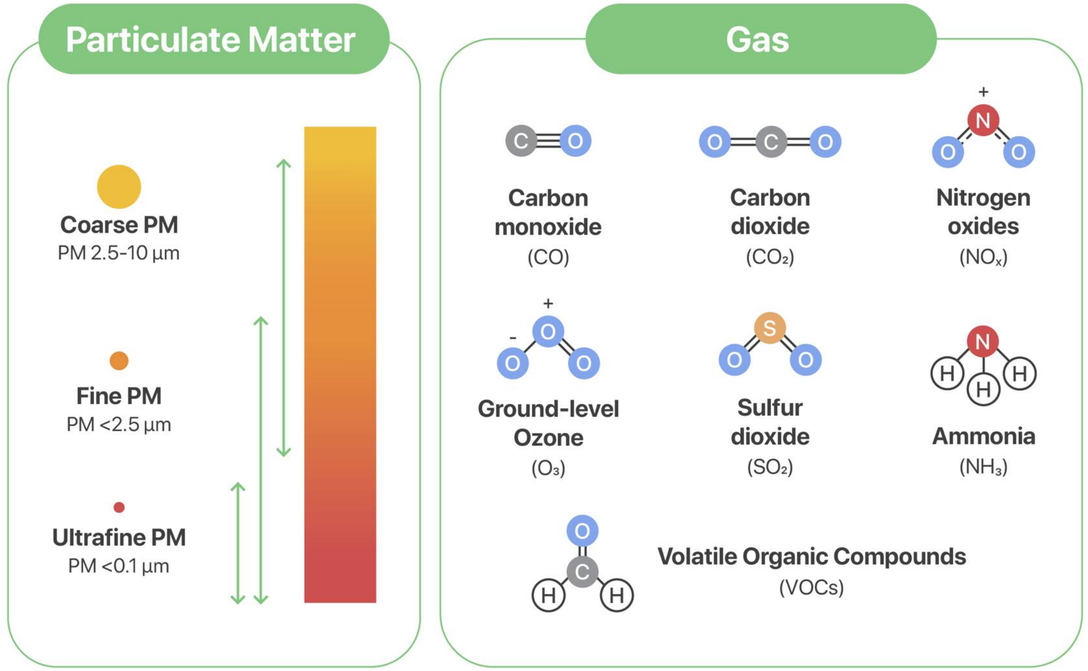


The Planetary Boundary Layer is an atmospheric layer that extends from the Earth's surface up to 800 meters.

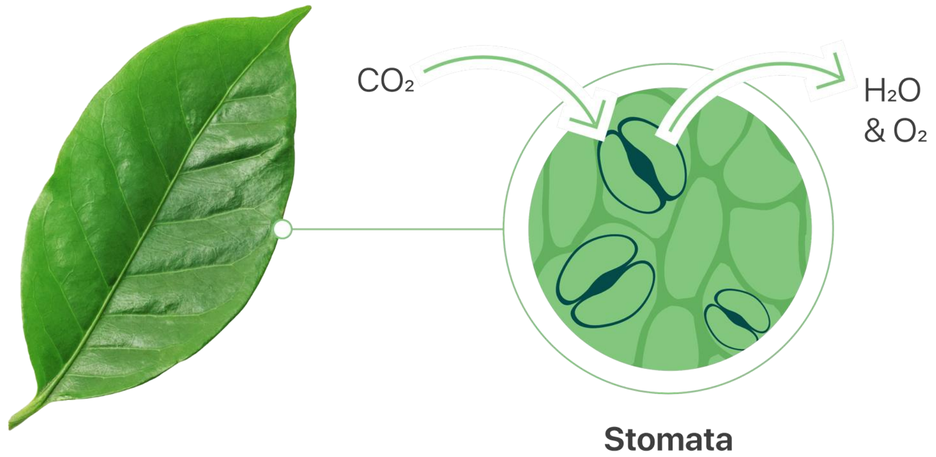
The conditions within this layer vary between morning and night. As the sun sets, the layer's altitude decreases. This reduction causes a higher concentration of pollutants due to the accumulation and limited vertical dispersion.

Why 'Greening' Isn't Sufficient to Combat Air Pollution

Air pollution exists in two primary forms: particulate and gaseous.



Plants and trees can only absorb the gaseous form of pollutants.



However, when these plants take in excessive amounts of certain gaseous pollutants, such as SO2, NOx, and CO, **they can weaken over time.** This is because they are not inherently equipped to handle such a 'burden.'

IMPORTANT TO NOTE 🔎

Deposition Deposition is the process where a substance transitions from a gas phase directly to a solid phase without passing through a liquid phase. This mechanism enables plants to 'trap' particulate pollutants, like PM2.5.

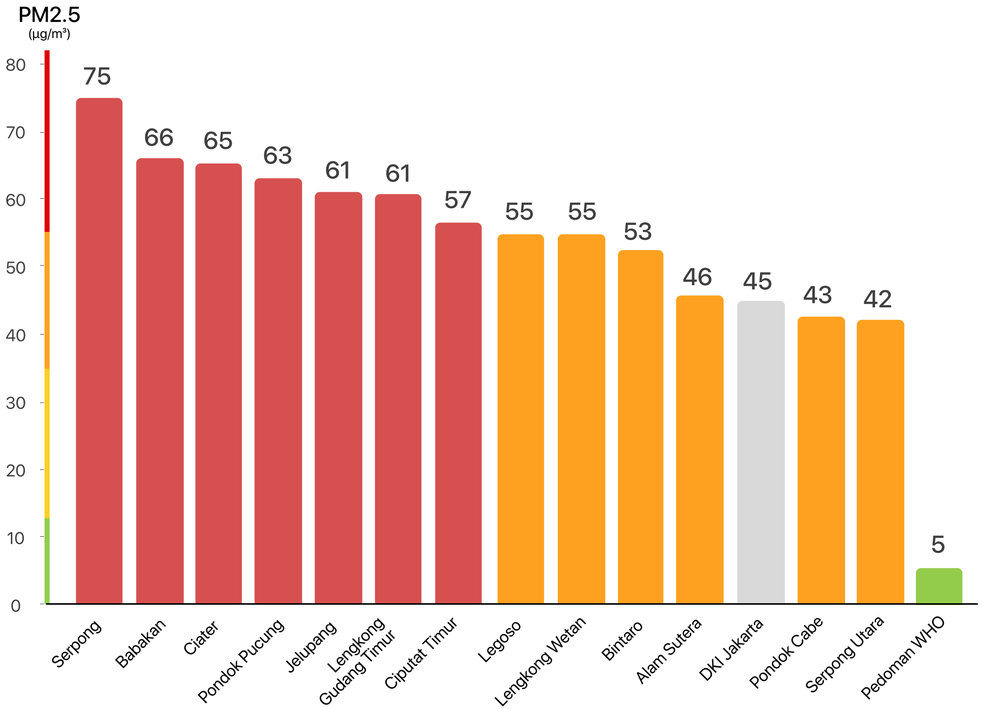
Why 'Greening' Isn't Sufficient to Combat Air Pollution

👩🏻‍⚕️ A study from the US EPA indicates that trees remove only about 0.24% of PM2.5 from the air.

Satellite imagery shows an abundance of green areas in South Tangerang, particularly on the west side.

However, according to the Nafas monthly report from May 2023, despite South Tangerang being synonymous with 'green' residential areas, pollution levels remain high.

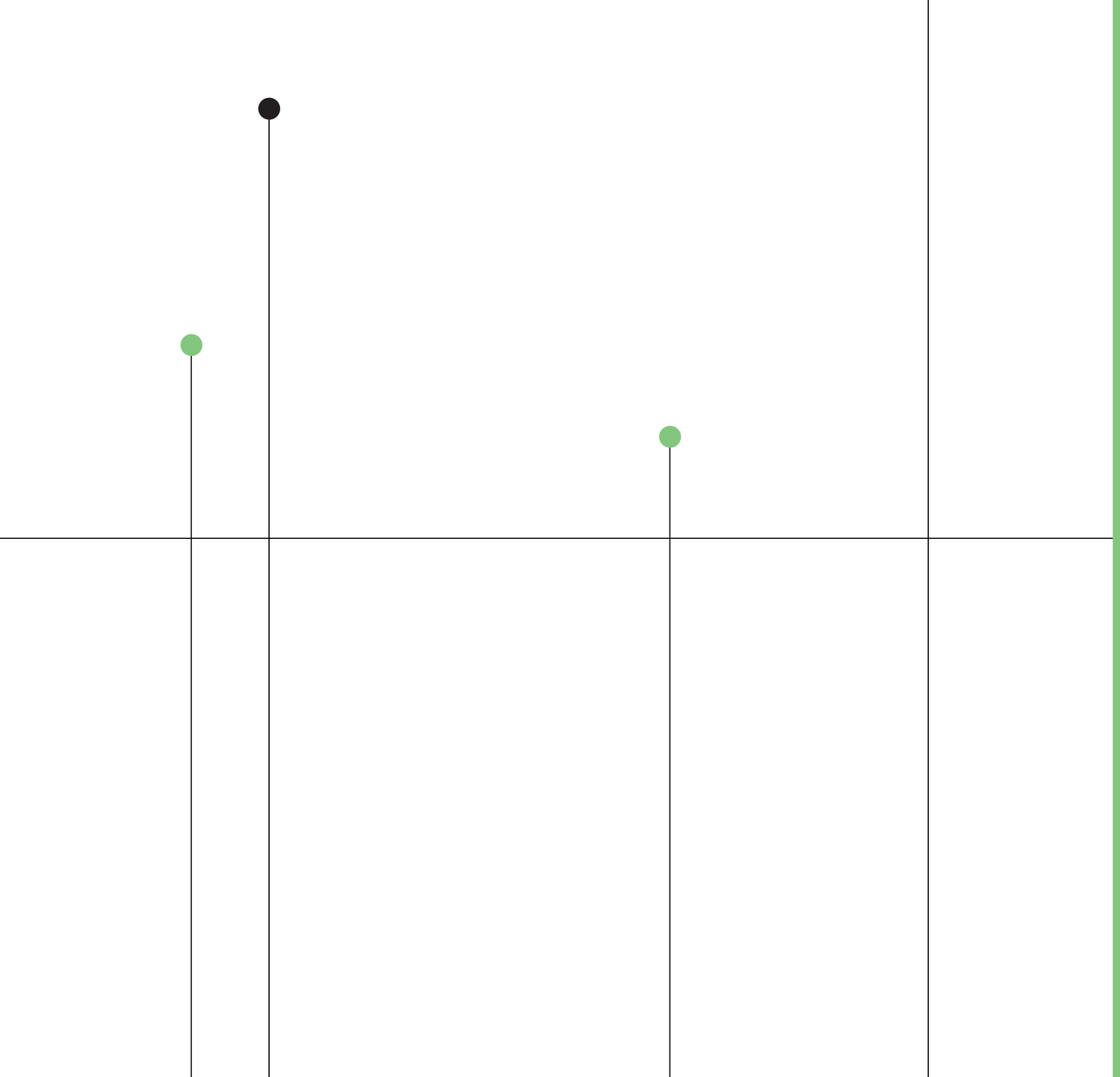
Sumber: fs.usda.gov



Baik · Moderat · Tidak Sehat Bagi Kelompok Sensitif · Tidak Sehat · Sangat Tidak Sehat

What is the conclusion?

SIMPLY GREENING AN AREA IS NOT AN EFFECTIVE SOLUTION TO THE AIR POLLUTION PROBLEM.



Thousands of studies have conclusively demonstrated that prolonged exposure to air pollution can adversely affect the physical and cognitive development of children.

Health Impacts of Air Pollution

SHORT-TERM EFFECT

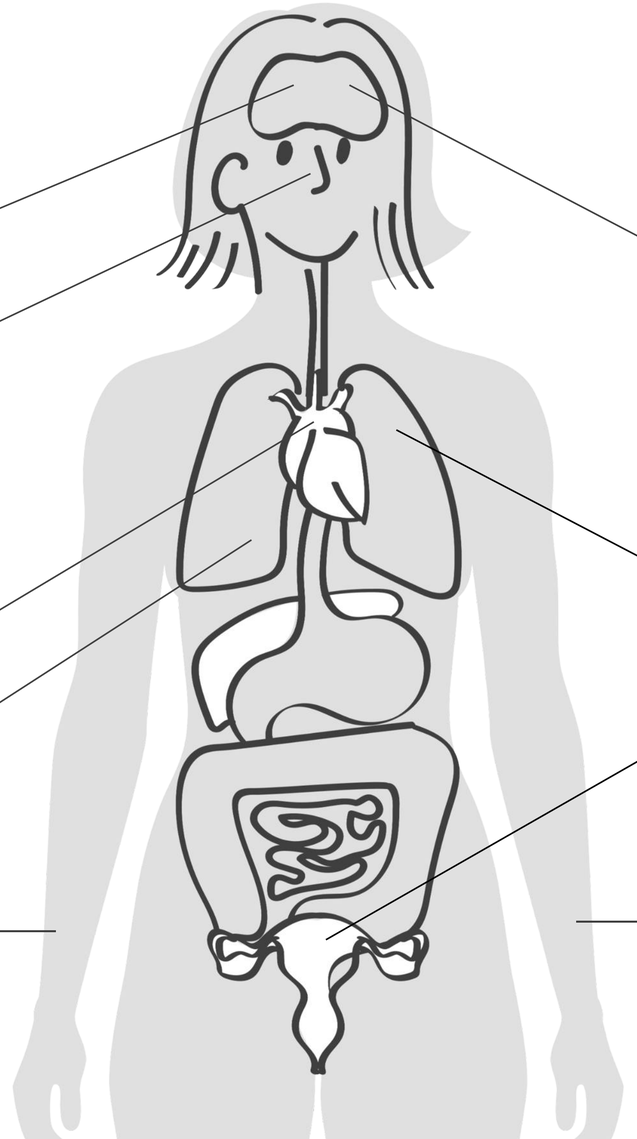
Brain
ADHD (From infancy to childhood)

Respiratory
Influenza, Rhinitis

Heart
Heart attack, arrhythmia

Lung
Asthma, Bronchiolitis

Skin
Atopic dermatitis (eczema), acne, early aging



LONG-TERM EFFECT

Brain
Alzheimer, Parkinson's, stroke, cognitive degradation

Lung
Pneumonia, lung cancer, asthma

Ovary
Premature birth

Whole Body
Blood blockage

Sumber: Dikumpulkan dari berbagai jurnal penelitian.

*Konten ini bertujuan untuk edukasi. Kami sarankan untuk berkonsultasi langsung dengan dokter jika merasakan satu atau lebih dari gejala penyakit-penyakit berikut.

ADHD, influenza, and heightened asthma attacks are just three of the numerous adverse effects of PM2.5 on Children

16 µg/m³

Increased risk of ADHD

Children exposed to PM2.5 concentrations of 16 µg/m³ during their first three years have heightened risk potentials. This risk escalates further when PM2.5 levels surpass 50 µg/m³.

Source

15%

Increased risk of influenza

There's a 15% higher risk with every exposure to PM2.5 levels exceeding 10 µg/m³ over a span of 6 days.

Source

3.6%

Increased risk of asthma attack

There's a 3.6% increased risk for every 10 µg/m³ rise in PM2.5 exposure.

Source

Glosarium

a

ATMOSPHERE

A layer of gases that envelops our Earth. We reside in the lowermost layer of the atmosphere, known as the troposphere, which extends from the Earth's surface up to about 12 km.

b

ANNUAL THRESHOLD LIMIT VALUE

This is an air quality standard established by the World Health Organization (WHO). In 2021, the WHO revised the annual threshold limit value, reducing it from 10 µg/m³ to 5 µg/m³. The daily threshold limit value (covering a 24-hour period) is set at 15 µg/m³.

BOUNDARY LAYER

This atmospheric layer extends from the Earth's surface up to 2 km and can vary over time.

g

GROUND-LEVEL AIR POLLUTION

Refers to air pollution that is found very close to the Earth's surface

h

HYPERLOCAL POLLUTION

A phenomenon where air pollution is highly concentrated in a specific, limited area due to the presence of local pollution sources within that vicinity.

p

PM2.5

articles in air pollution that are 2.5 micrometers in size, which is about 36 times smaller than the diameter of a grain of sand.

s

SENSITIVE/VULNERABLE GROUP

This refers to individuals who are particularly susceptible or at a higher risk of being affected by certain conditions. Examples include children, the elderly, individuals with allergies, and those suffering from asthma.

t

TRAPPING LAYER

An atmospheric layer that has the capacity to hold or trap pollutants near the Earth's surface, thereby increasing detectable pollution levels in that area. This is commonly known as the inversion layer.

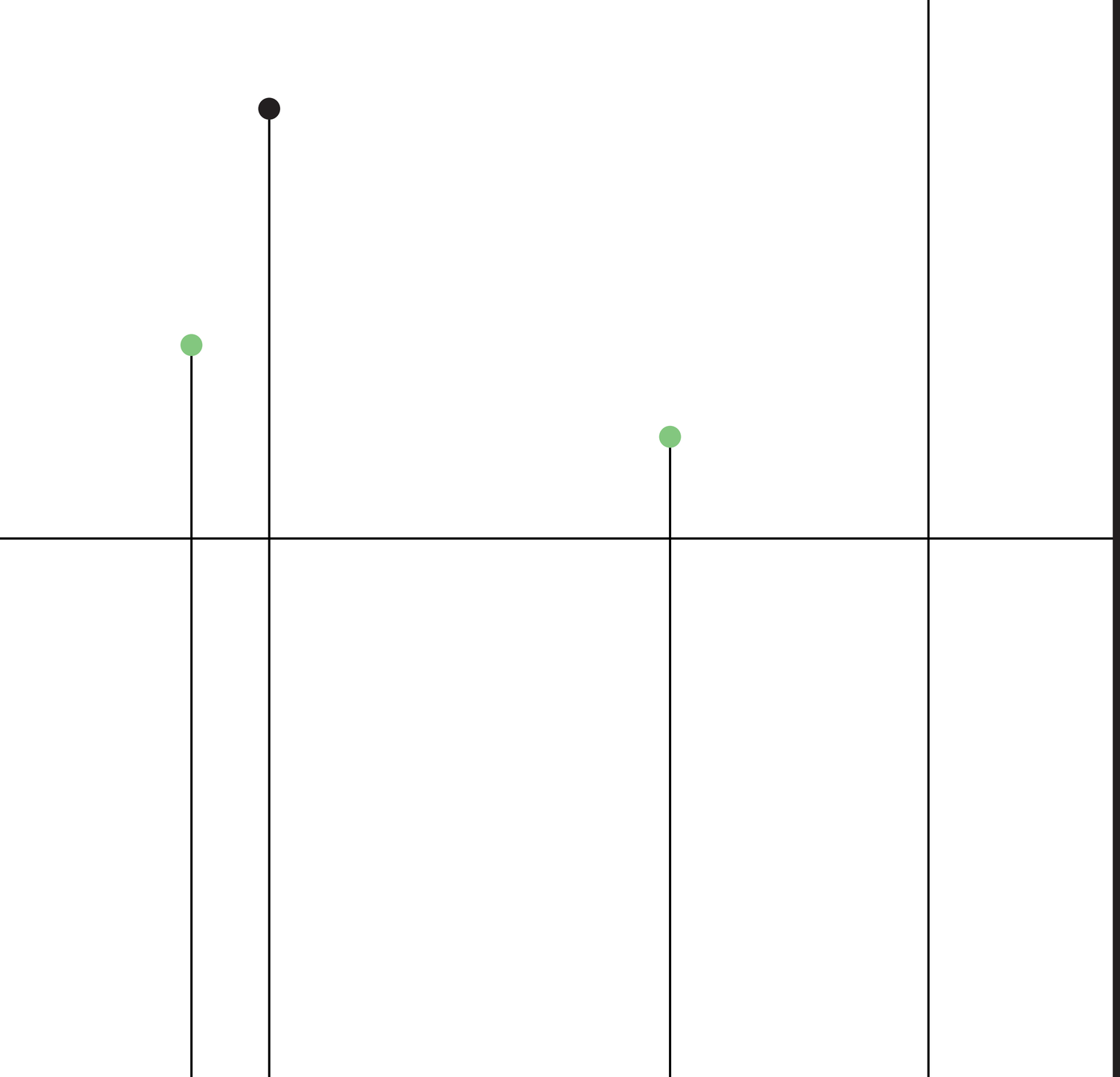
Nathan
Roestandy

Co-founder &
CEO of nafas

Piotr
Jakubowski

Co-founder &
CGO of nafas

September is undeniably a month buzzing with excitement. With a slew of outdoor events, from music festivals to sporting activities, there's something for everyone. Although the average monthly pollution levels seem to have seen a slight dip compared to the previous month, daily bouts of pollution persist in various areas. This indicates that the overall air quality hasn't seen significant improvement. Stay alert!



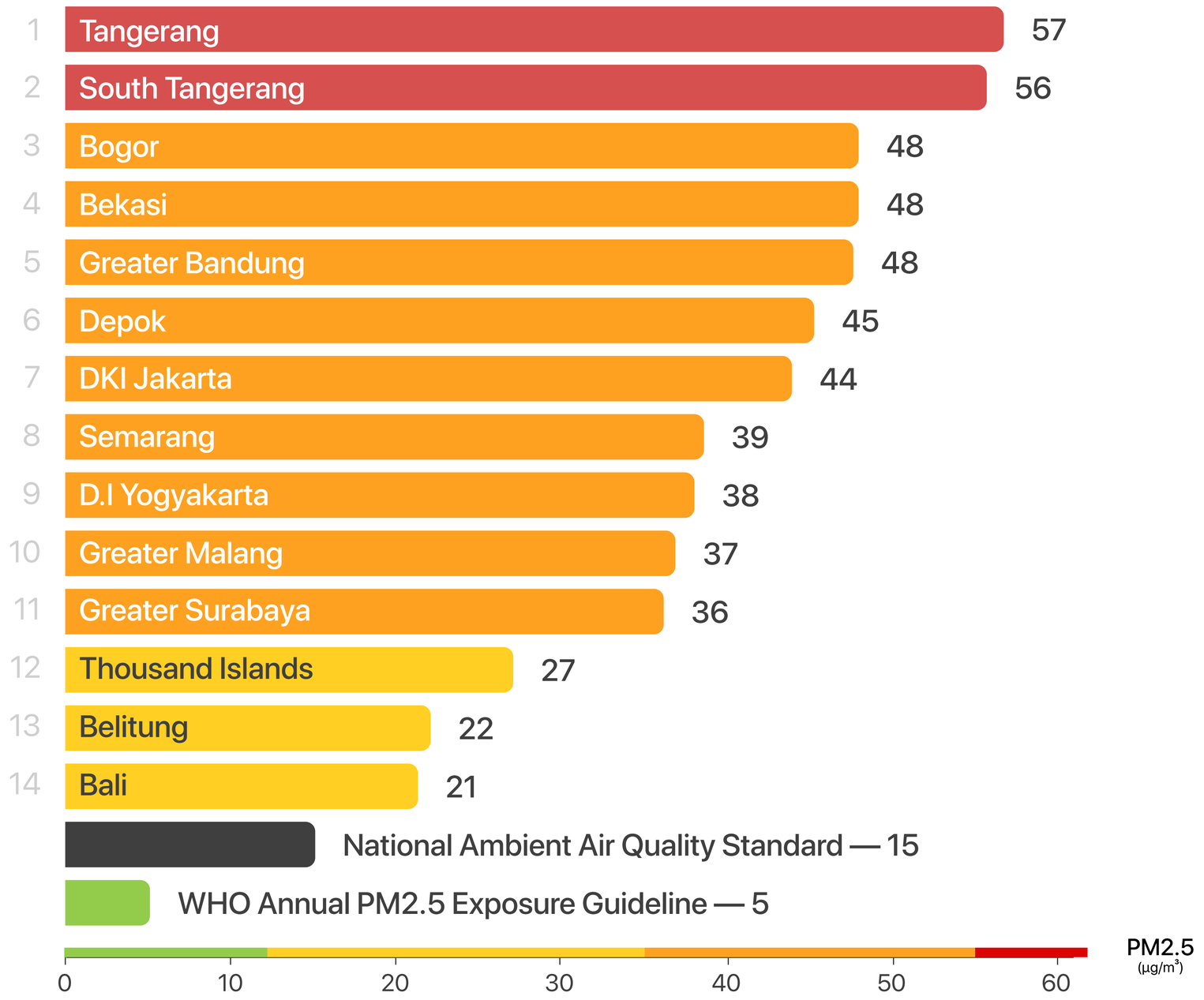
02

september
2023
air quality
data

City Rankings

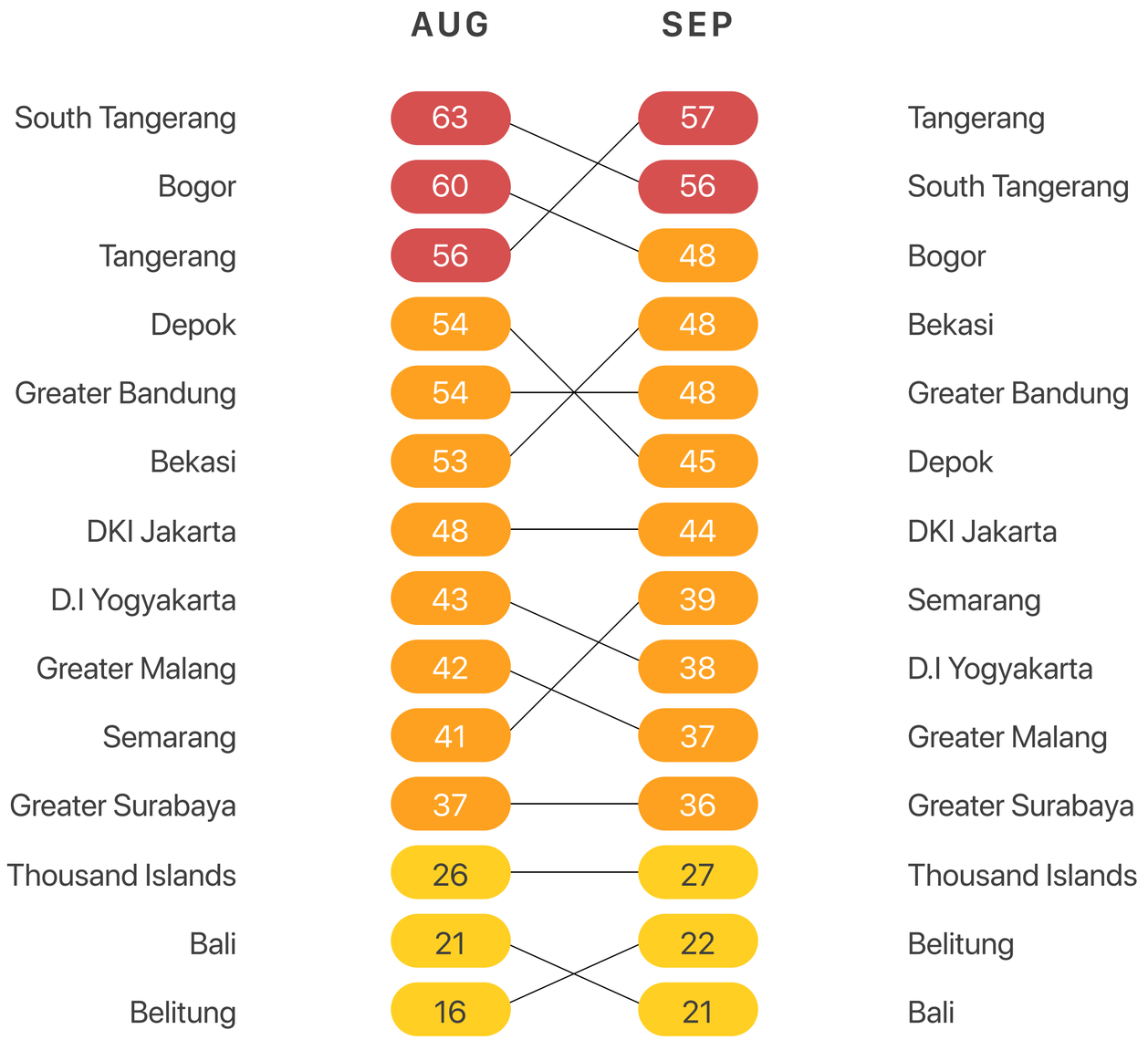
This ranking is determined by the cities with the highest PM2.5 concentration levels in September 2023.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy



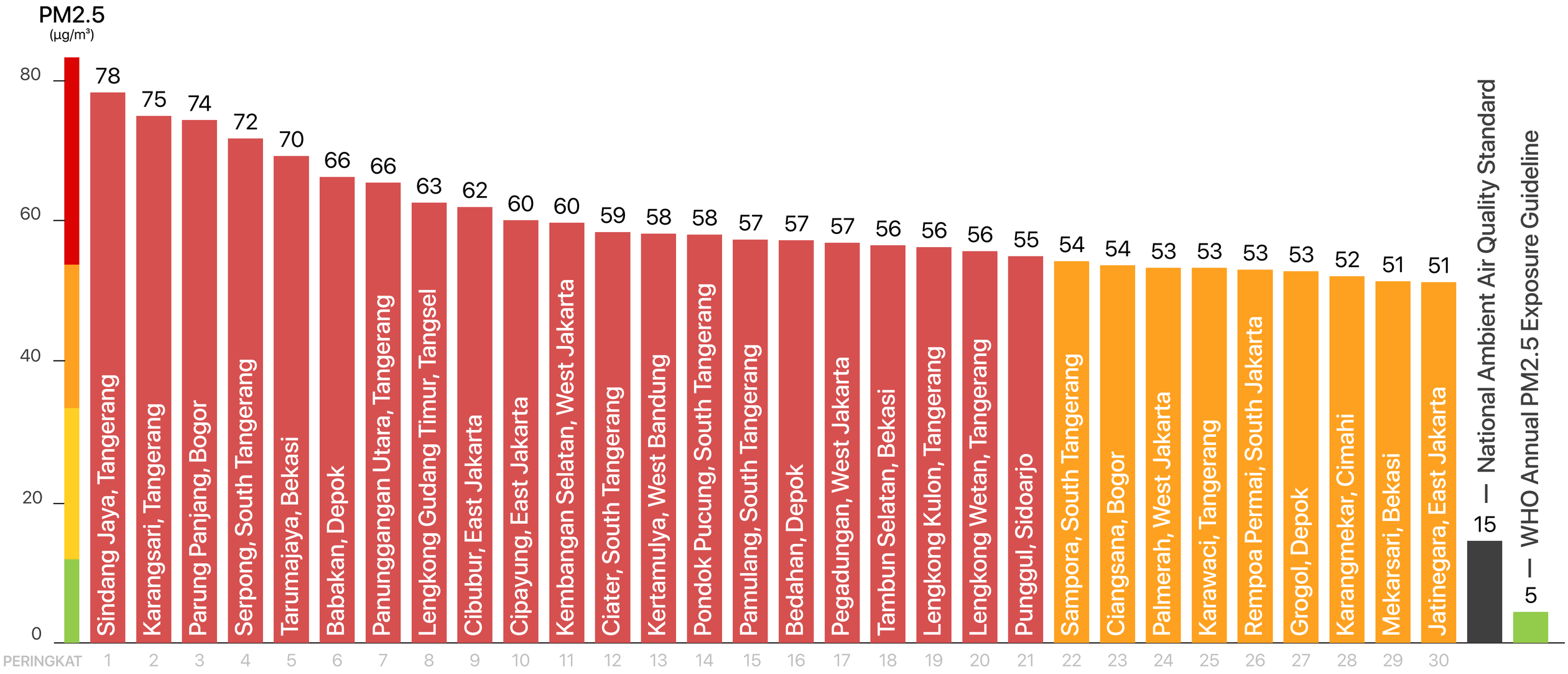
City Rankings

This displays the rankings of cities based on their PM2.5 pollution levels, providing a comparison with the previous month's data.



- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

30 Most **Polluted Locations**

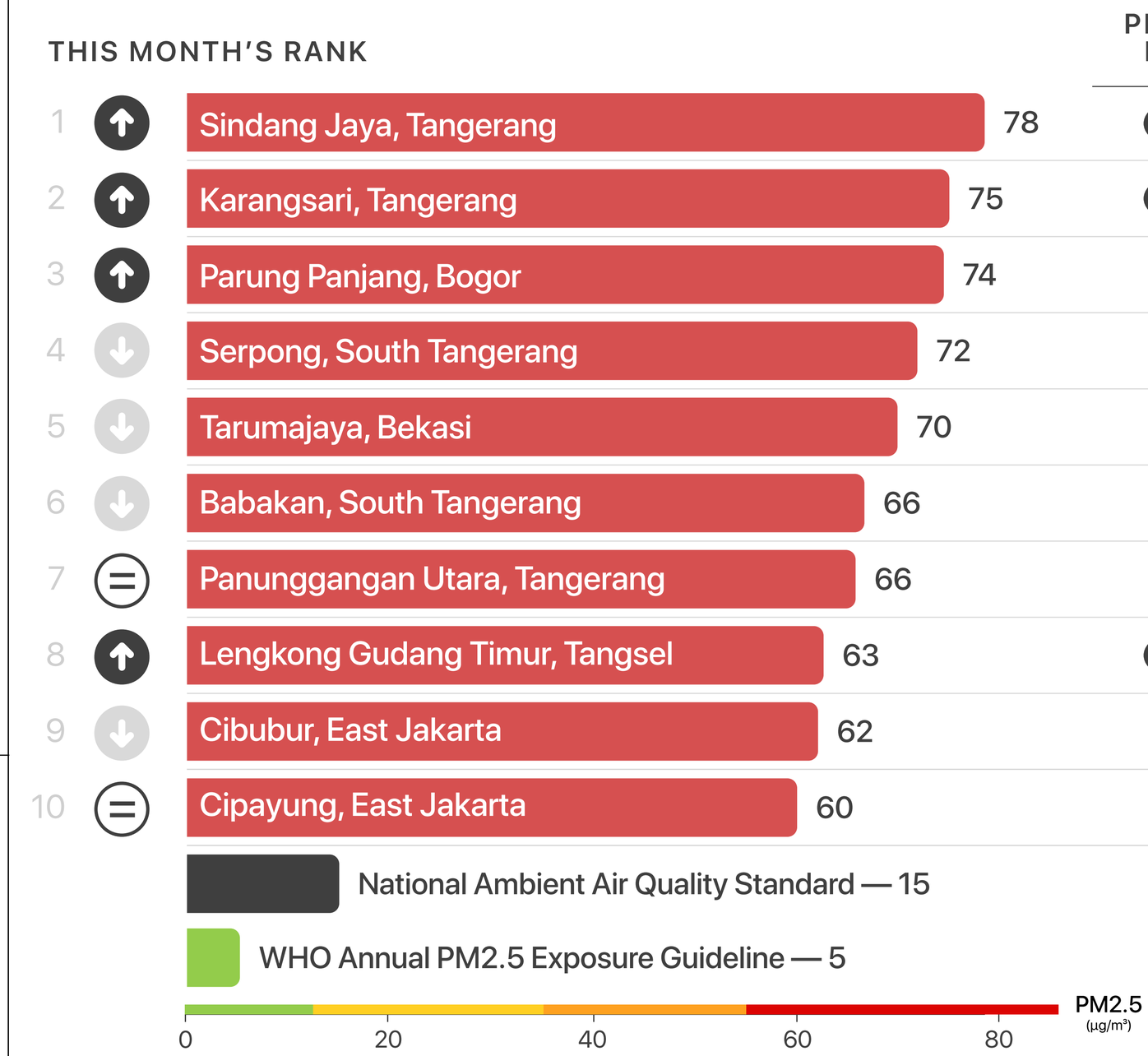


Good · Modetate · Unhealthy for Sensitive Groups · Unhealthy · Very Unhealthy

Top 10 Most Polluted Location

This ranking identifies the sensor points with the highest PM2.5 concentrations in September 2023 and compares them with the conditions from the previous month.

- Good
- Moderate
- Unhealthy for Sensitive Groups
- Unhealthy



Cigarettes Equivalence

The equivalence to cigarette smoke is determined by the daily average of PM2.5. A concentration of 22 µg/m³ is equivalent to the exposure from one cigarette.

*) Measurement methodology is based on berkeleyearth.org

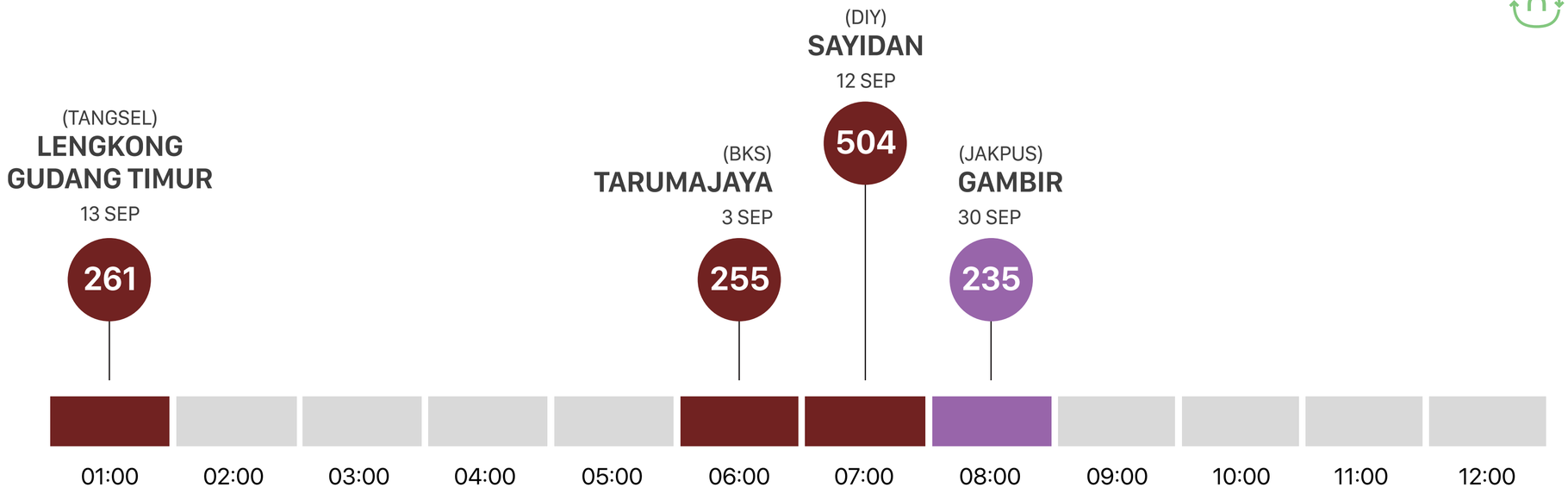
		NUMBER OF CIGARETTES
1	Sindang Jaya (TNG)	107
2	Karangsari (TNG)	104
3	Parung Panjang (BGR)	101
4	Serpong (TANGSEL)	98
5	Tarumajaya (BKS)	95
6	Babakan (TANGSEL)	91
7	Panunggangan Utara (TNG)	89
8	Lengkong Gudang Timur (TANGSEL)	85
9	Cibubur (JAKTIM)	85
10	Cipayung (JAKTIM)	82

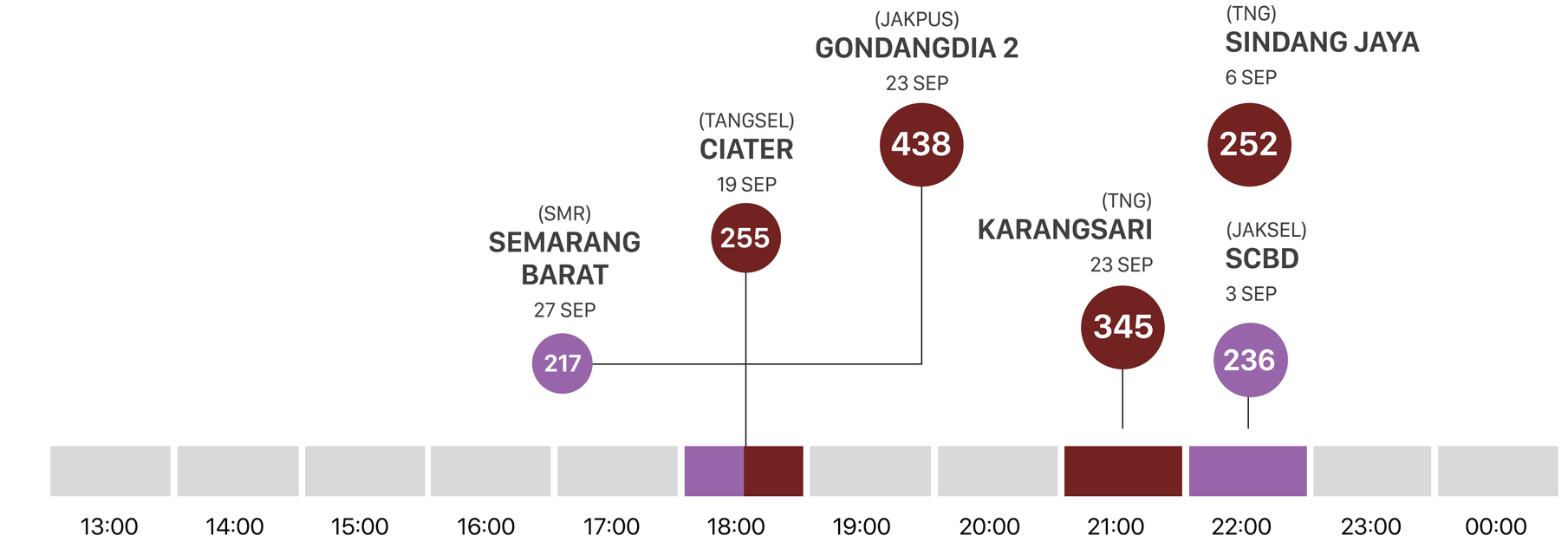
Top 10 Most Polluted Hours

The ranking is based on the time when the worst PM2.5 pollution occurs on September 2023

Should PM2.5 levels reach the "Hazardous" category, do not panic. Stay alert to notifications, such as those related to mosquito fogging activities. However, remember that spikes in PM2.5 levels can result from various factors, not just one. Stay informed and vigilant!

- Good
- Moderate
- Unhealthy for Sensitive Groups
- Unhealthy
- Very Unhealthy
- Hazardous





The increase in PM2.5 levels may caused by anti-mosquito fumigation activities

Nafas Alert

LATEST UPDATE ON THE NAFAS APP

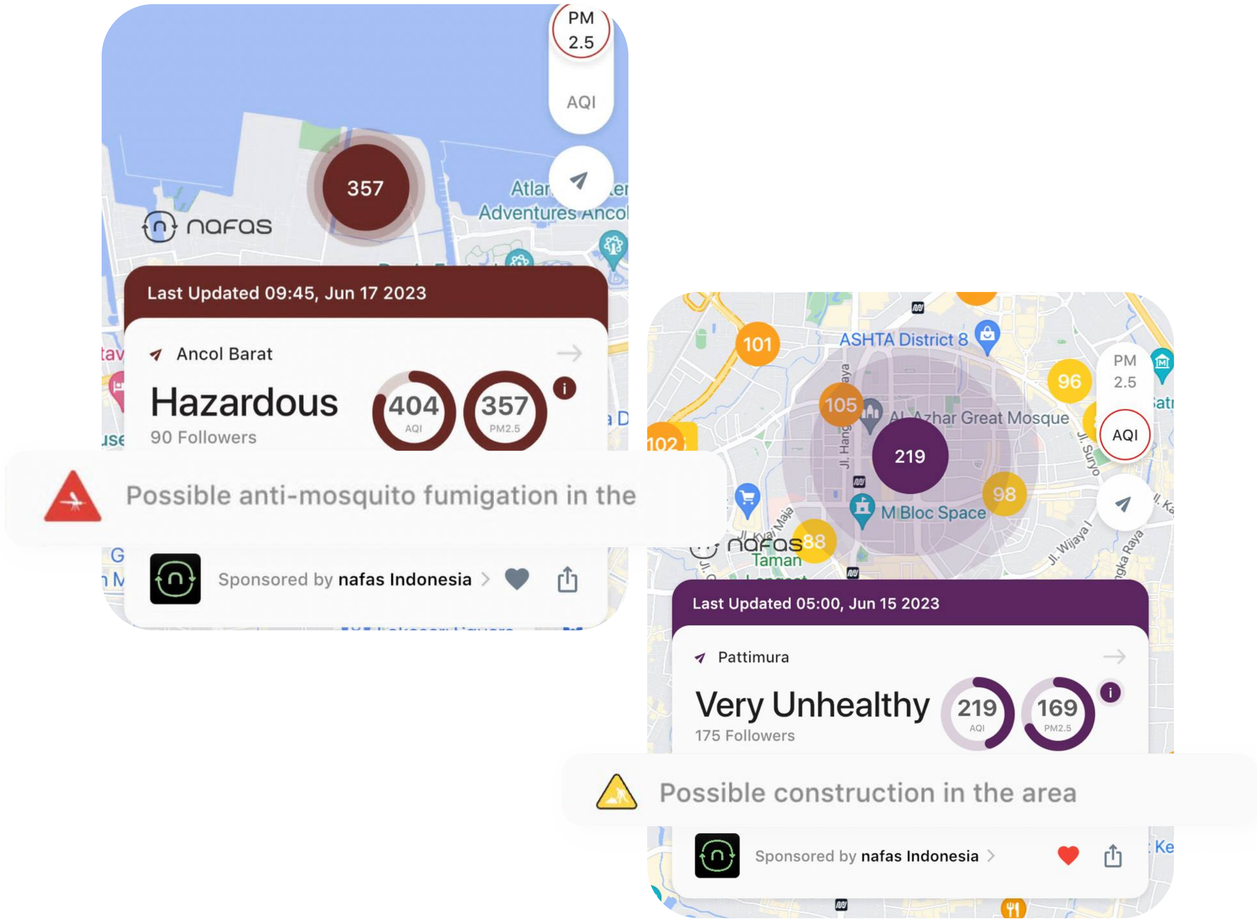
Apart from the **Anti-mosquito Fumigation Alert**, now we have added **Construction Alert** so you can find out why the air quality might dip in certain areas.

WHAT YOU NEED TO KNOW

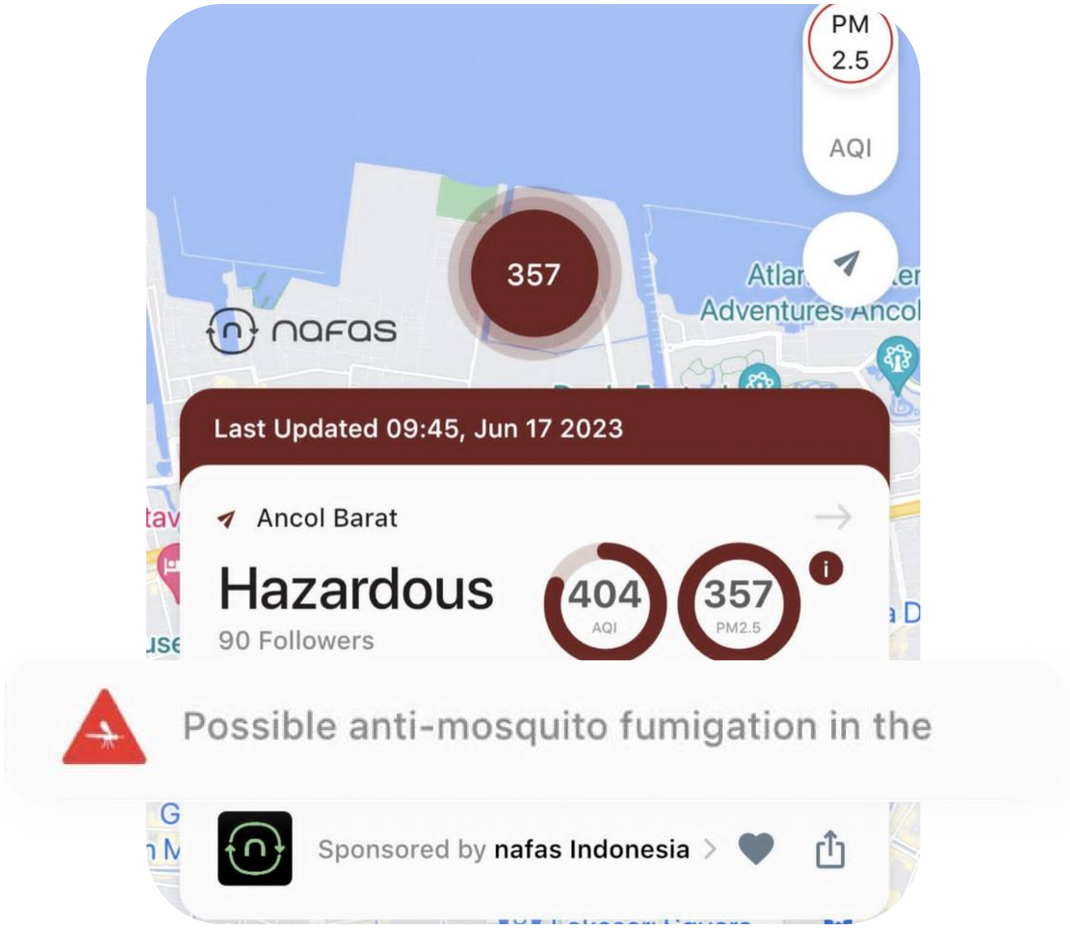
🦟 When there's anti-mosquito fumigation, the PM2.5 levels can suddenly skyrocket, sometimes even reaching the 'Hazardous' level. But don't panic! This spike is temporary and things will settle back to normal pretty quickly.

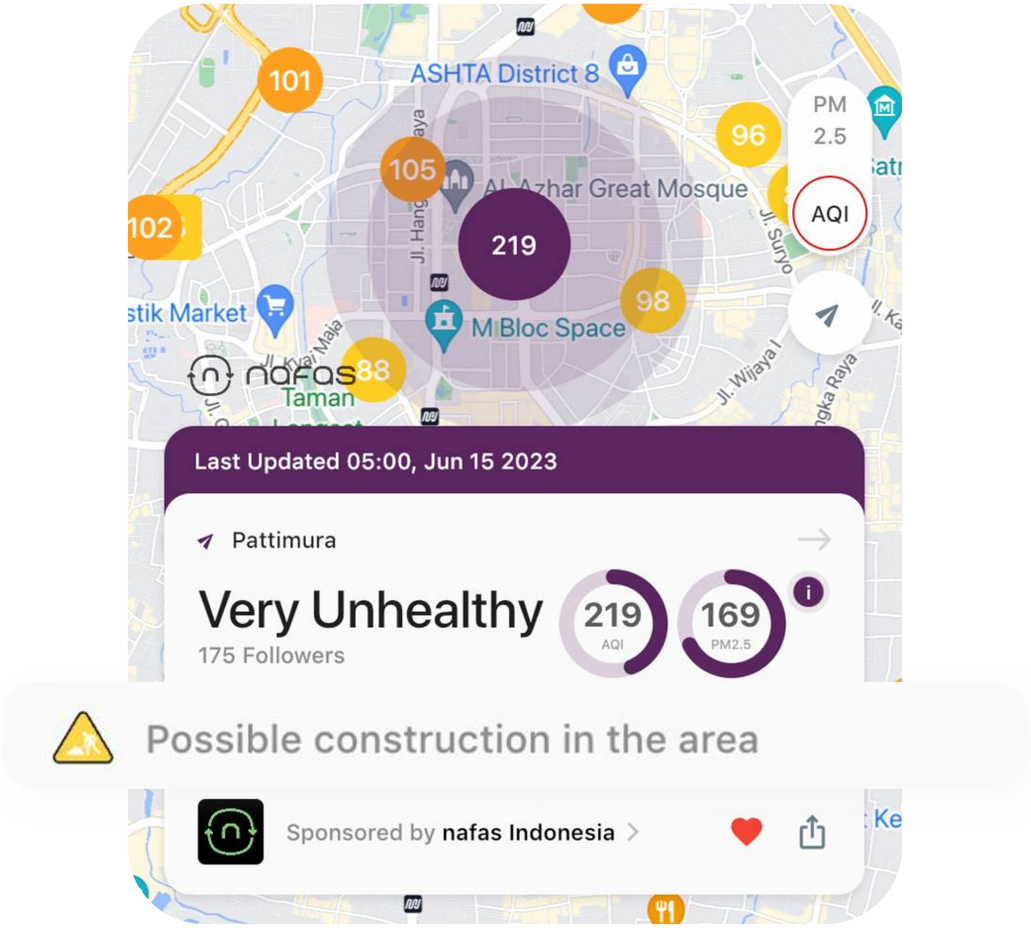
🏗️ Construction alerts? Well, this one sticks around longer and can be a daily thing. For instance, if there's construction near the Pattimura sensor in South Jakarta, you'll notice a regular bump in PM2.5 levels from evening till the early hours.

Stay alert and don’t forget to regularly check the air quality on our app! 🍃



Nafas Alert





03

air
quality
stories &
insights

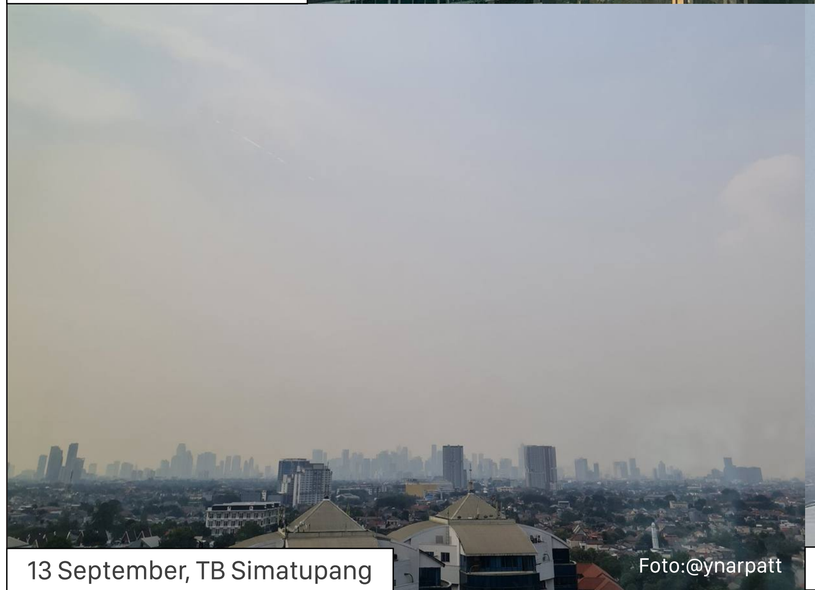
September Shades of Grey

5 September, Senayan

Foto: @sleeppyecaa

8 September, Setiabudi

Foto: @handriyanti.dp



13 September, TB Simatupang

Foto:@ynarpatt

18 September, Cengkareng

Foto: @eko0.png

19 September, BSD

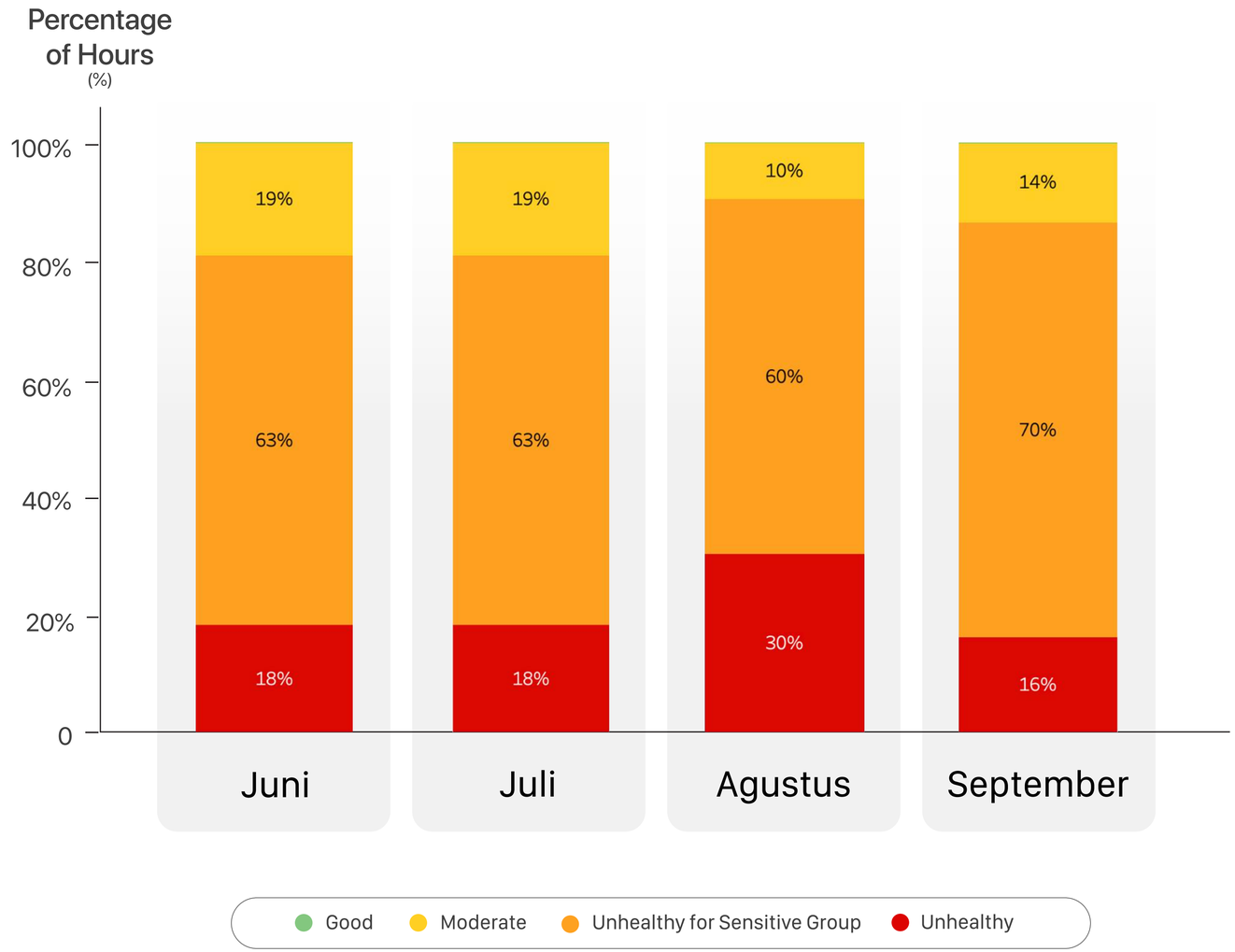
Foto: @luspinlapin

INSIGHT
№ 1

The frequency of "Unhealthy" air periods in September mirrors the previous month.

Data from September indicates a slight reduction in high pollution concentrations, with the **"Unhealthy" category dropping from 30% to 16%.**

However, the total hours categorized as **"Unhealthy"** air (whether for the general public or sensitive groups) remains almost consistent with the previous month.



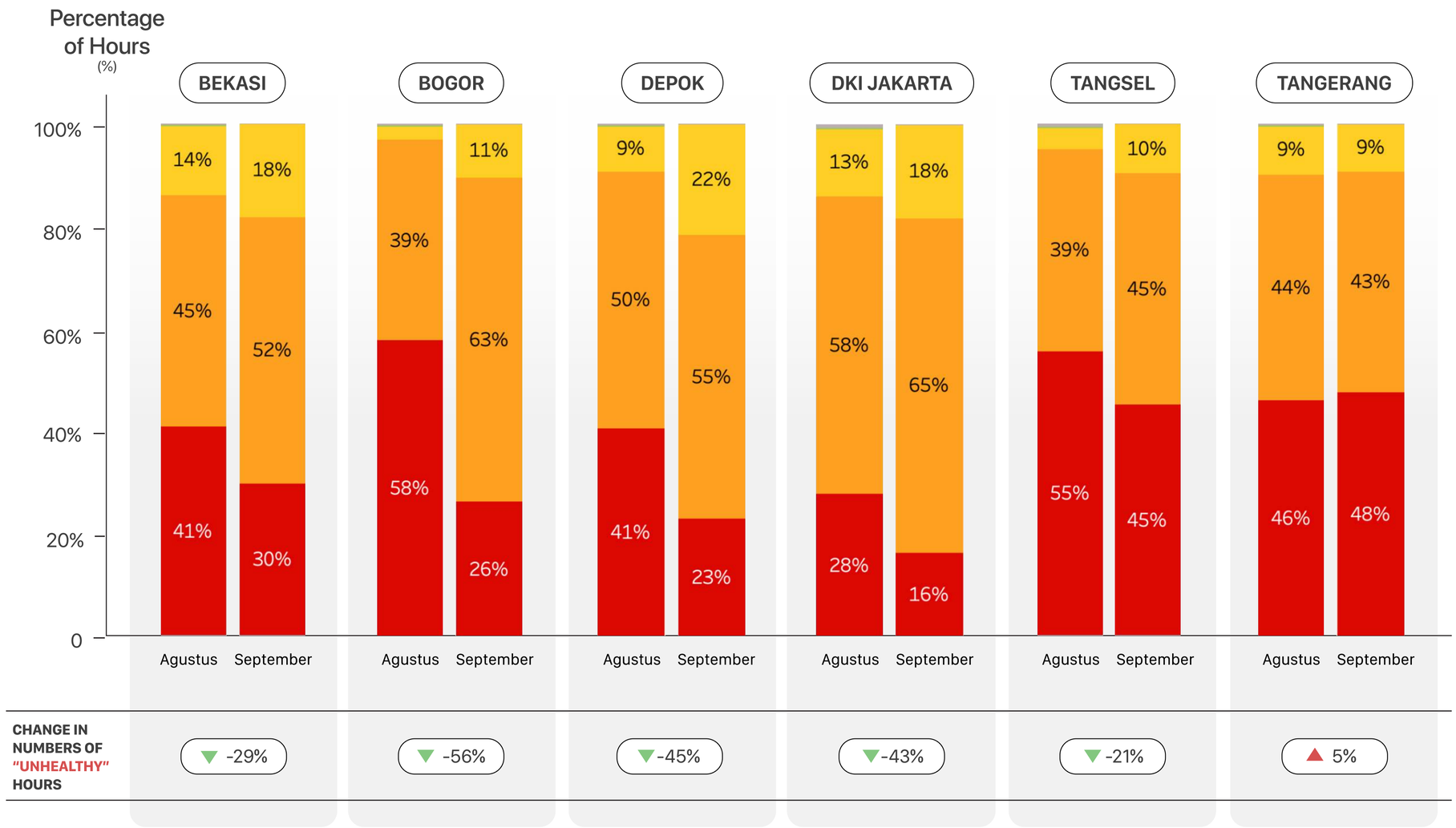
INSIGHT
№ 1

The frequency of "Unhealthy" air periods in September mirrors the previous month.

There appears to be a noticeable trend of significant reduction in high pollution levels in Depok and Bogor compared to DKI Jakarta and other satellite cities.

The number of hours with "Unhealthy" air quality in Kota Tangerang this September has been observed to be consistent with the previous month.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy



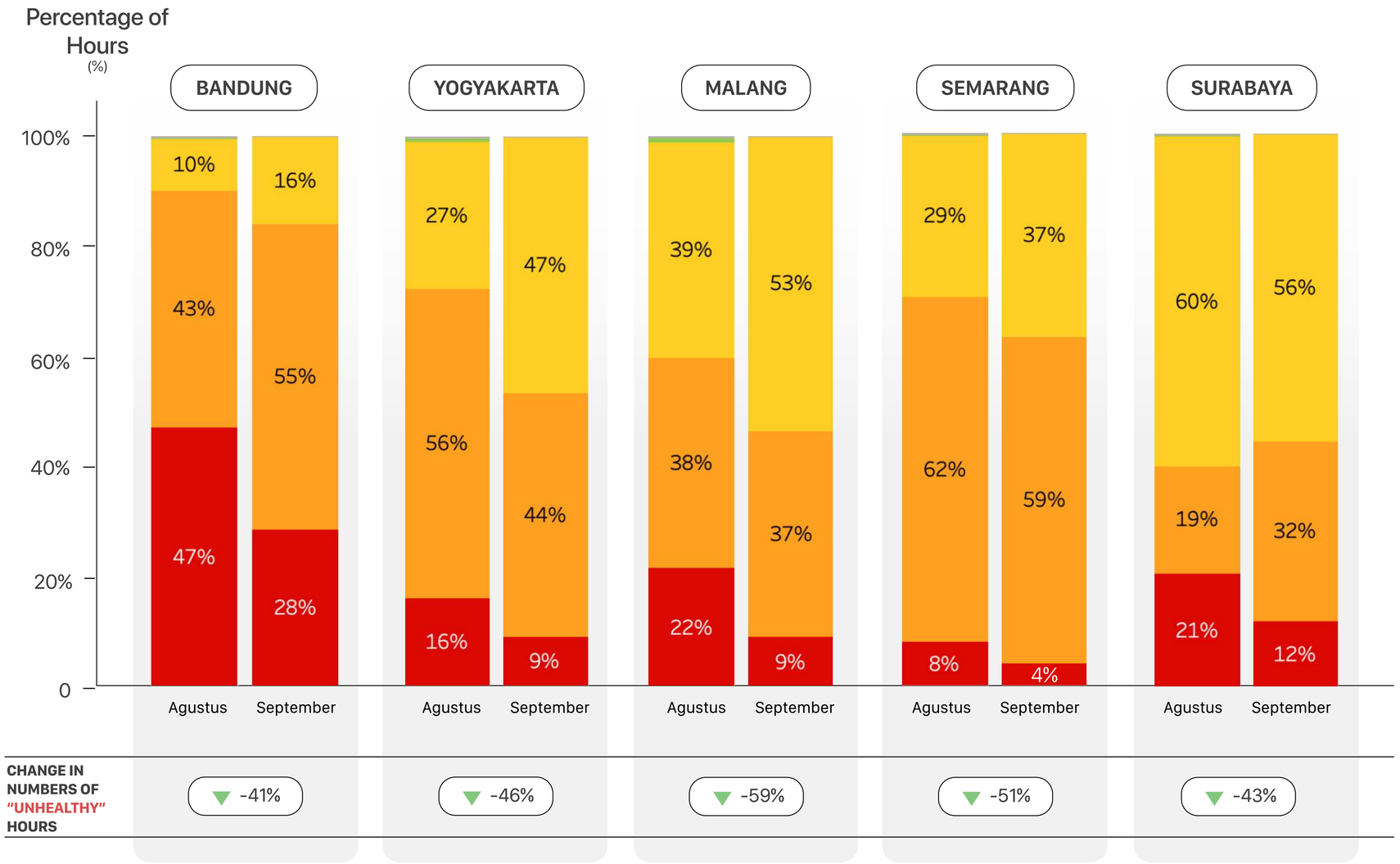
INSIGHT
№ 1

The frequency of "Unhealthy" air periods in September mirrors the previous month.

Air pollution is not just a problem in Jabodetabek.

The number of hours with **unhealthy air quality** (for both the general population and sensitive groups) in other cities like **Bandung Raya, D.I. Yogyakarta, Malang Raya,** and **Surabaya** has decreased. Only **Surabaya** has seen an increase in the number of hours with unhealthy air quality.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy



INSIGHT
№ 1

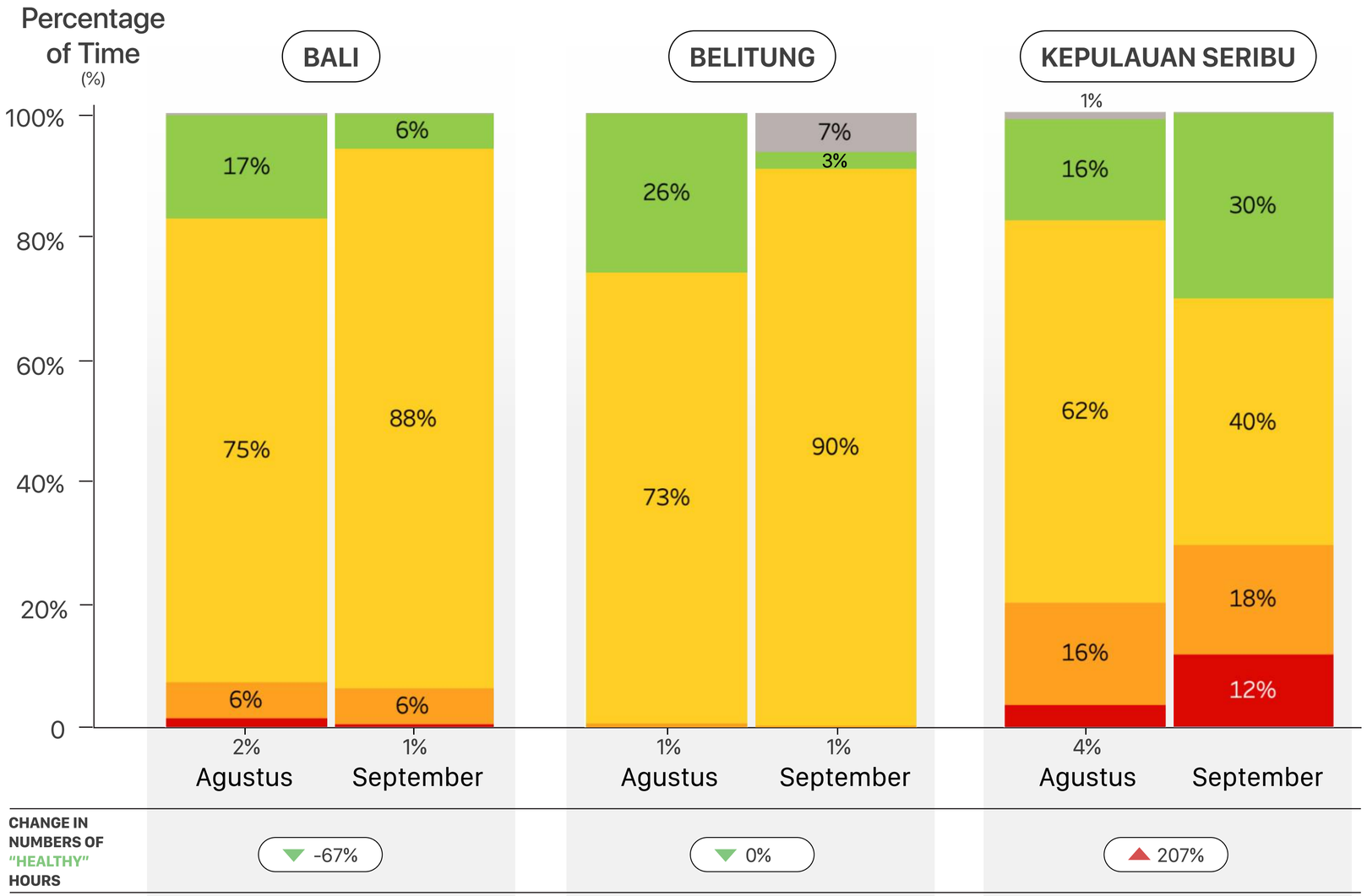
The "Healthy" air periods in the islands are gradually declining.

nafas

These regions are popular as "Healthy" air destinations. However, a noticeable decrease in the "Healthy" periods has been observed for Bali and Belitung in September.

Conversely, there has been an increase in "Unhealthy" air periods, both for the general population and for sensitive groups, in the Kepulauan Seribu.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy



INSIGHT
№ 1

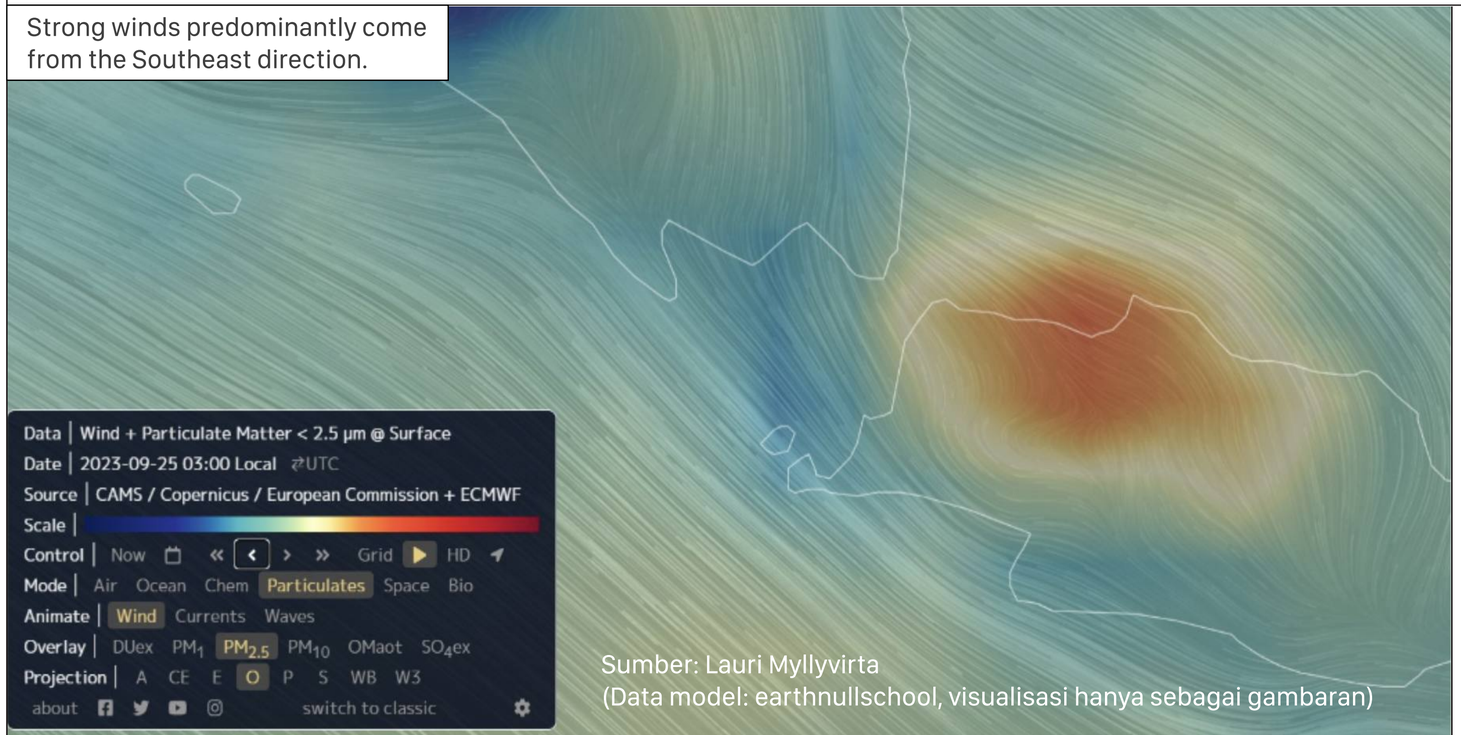
What Triggered the Air Quality Discrepancy in the Thousand Islands?

Compared to August, the Thousand Islands (Kep. Seribu) experienced an increase in pollution during the morning to midday hours in September, with a decrease in the afternoon. In contrast, the opposite situation was observed in the Ancol area, indicating a shift in the dominant wind direction during those times.

The frequency of **high pollution incidents in the Thousand Islands in September rose by 8%** compared to the previous month. Of all these high pollution events, 60% had dominant winds coming from the Southeast, 20% from the East, and 20% from the Northeast.

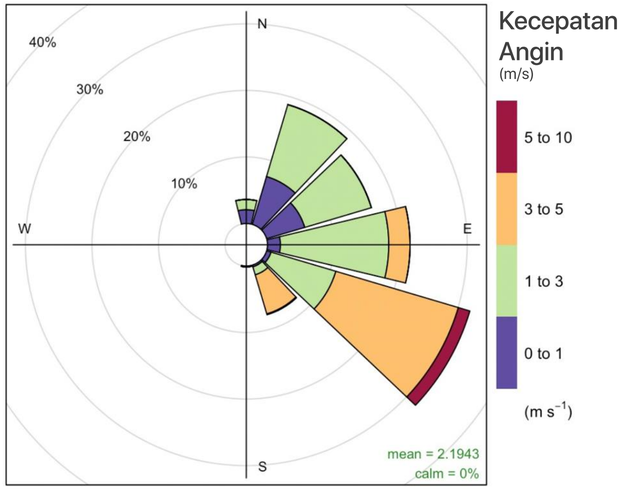
This suggests the potential occurrence of transboundary pollution, or cross-border pollution, moving from the mainland (Jabodetabek) towards the Thousand Islands. This means that **pollution from various sources in Jabodetabek can degrade the air quality in the Thousand Islands.**

Strong winds predominantly come from the Southeast direction.



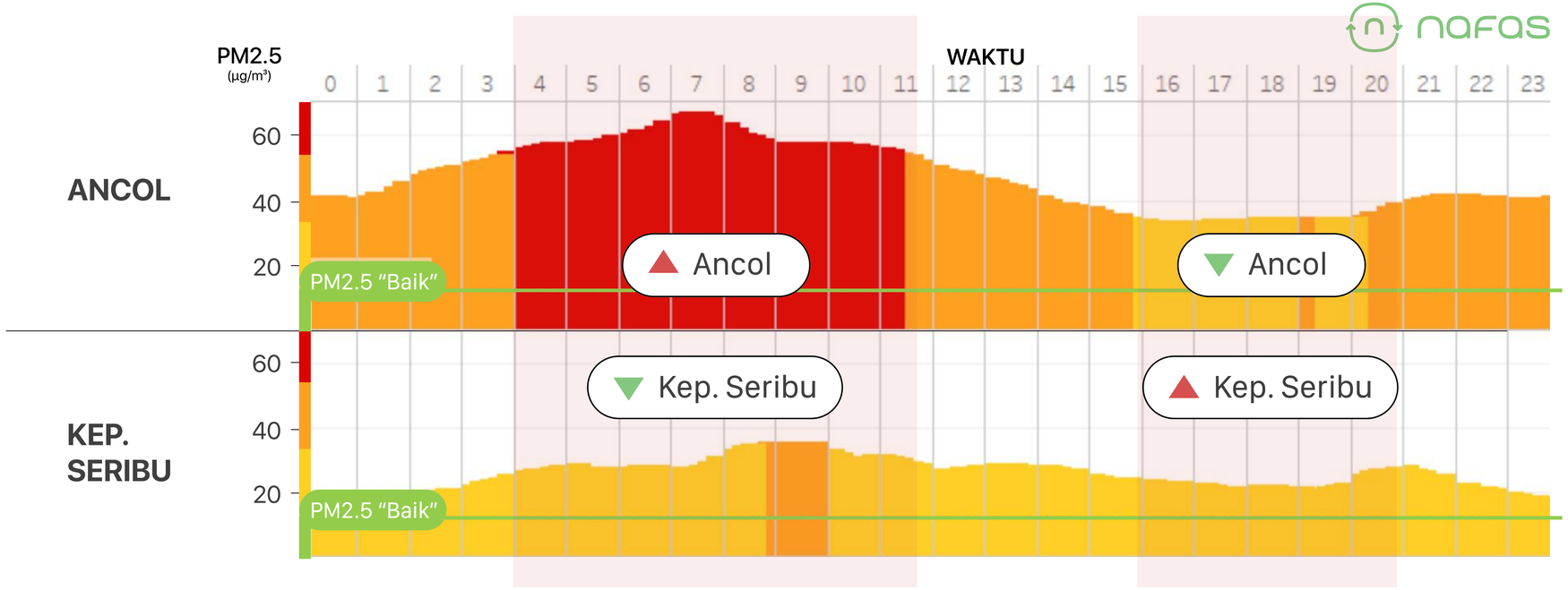
Sumber: Lauri Myllyvirta
(Data model: earthnullschool, visualisasi hanya sebagai gambaran)

The wind direction from the Southeast was both stronger and more dominant by 3-5% compared to August.

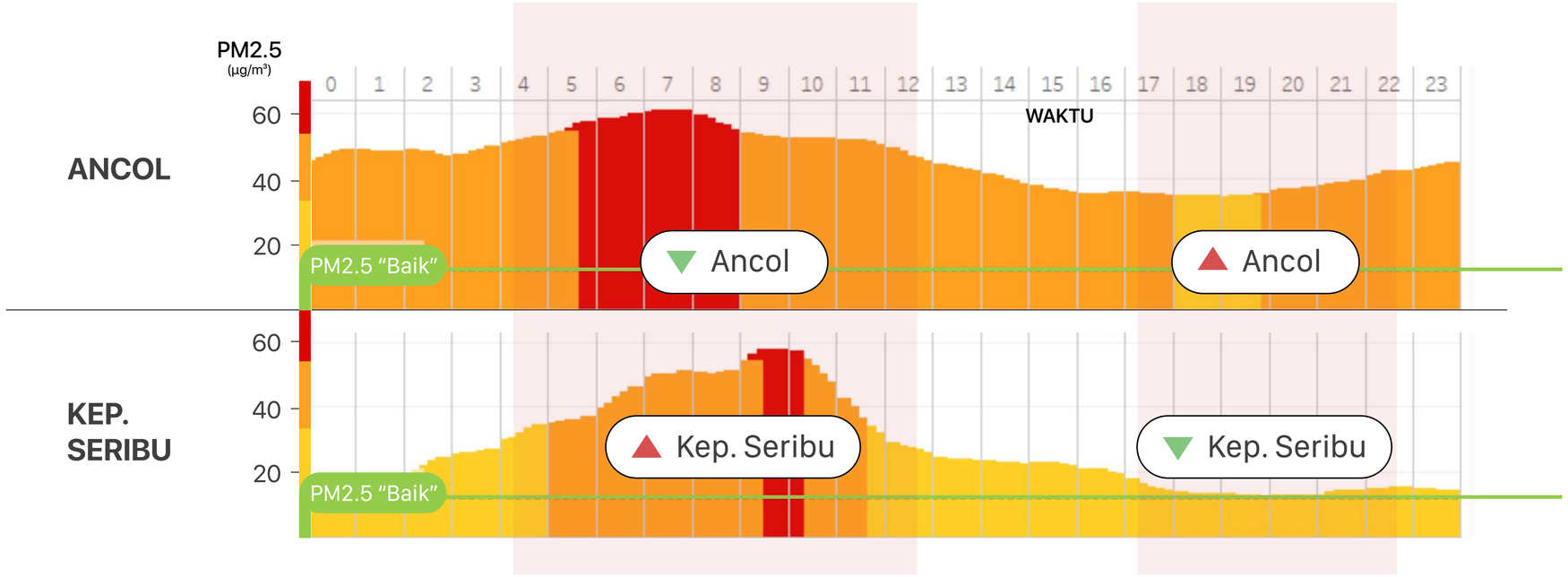


Average data every 10 minutes

AUGUST



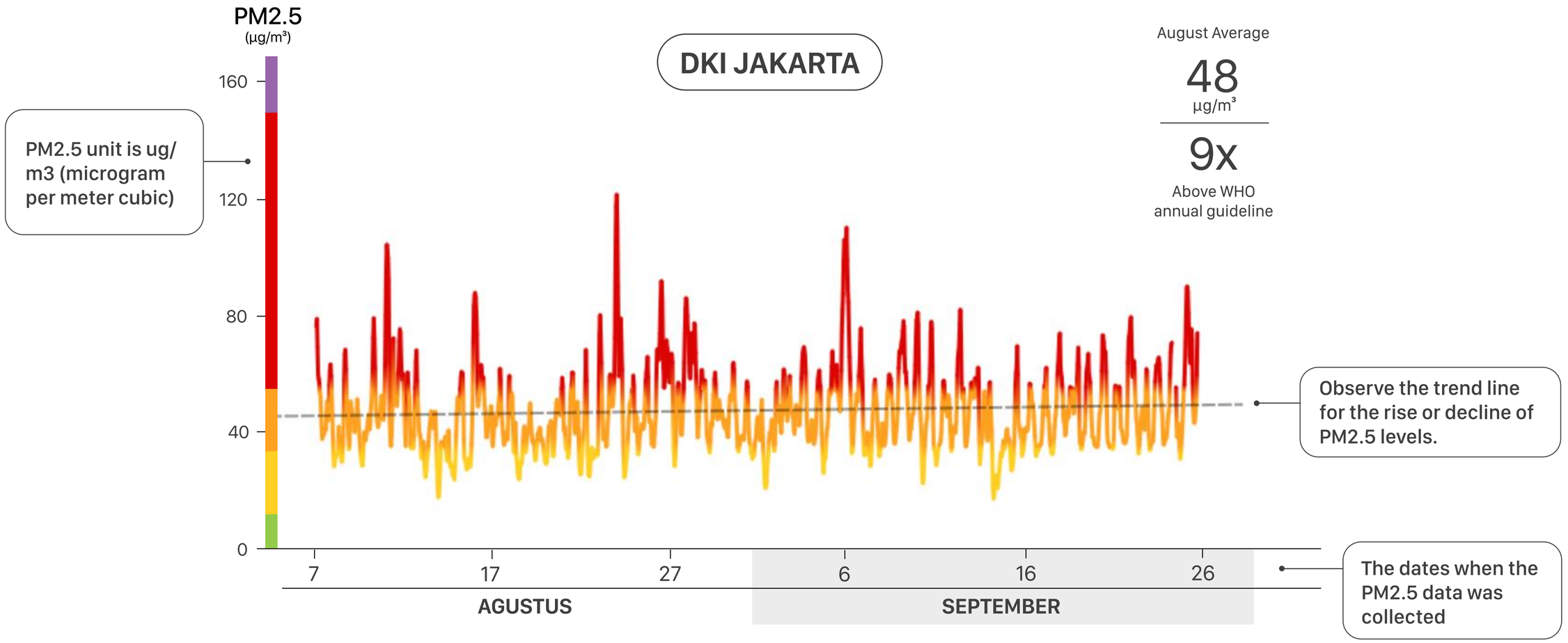
SEPTEMBER



INSIGHT
№ 2

The trend is declining, but pollution remained high in September

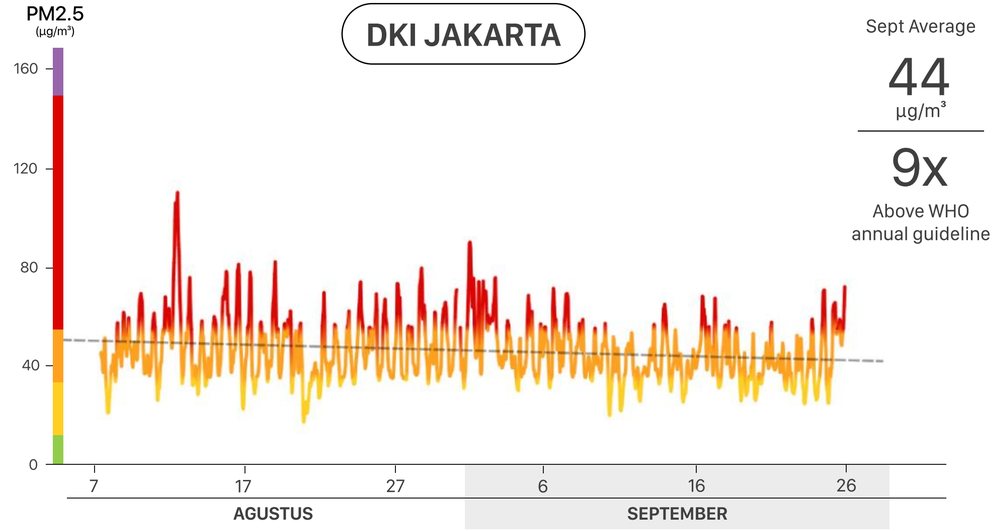
Brief Guide to Understanding the Insight Data



INSIGHT
№ 2

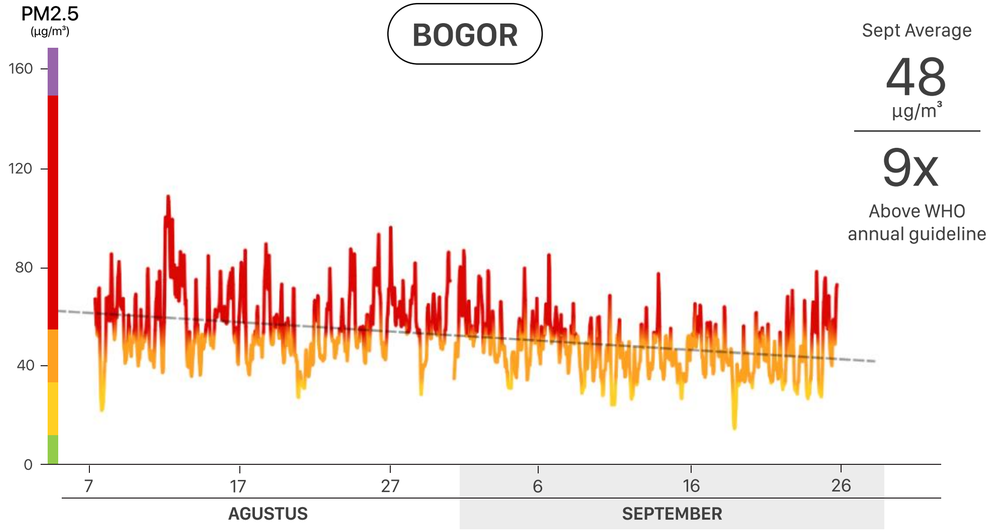
The trend is declining, but pollution remained high in September

DKI JAKARTA



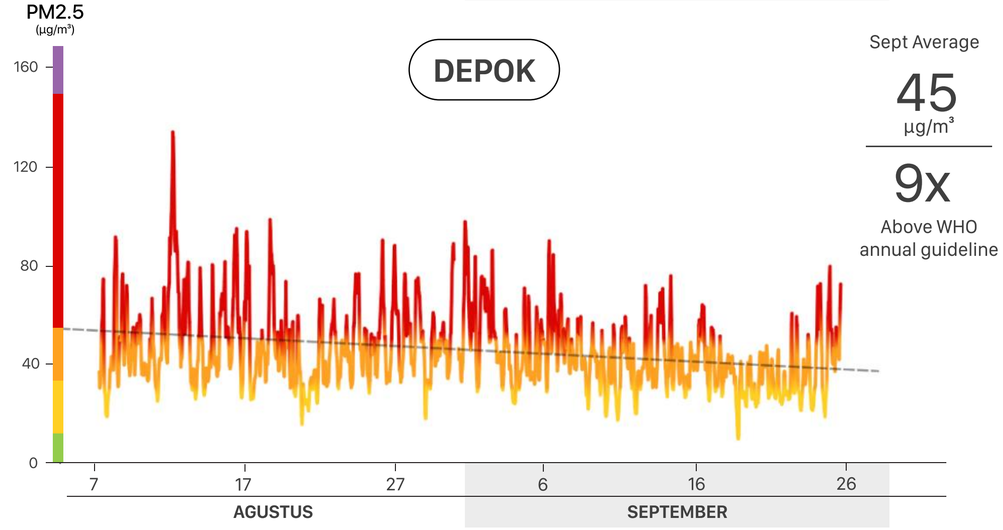
Sept Average
44
µg/m³
9x
Above WHO annual guideline

BOGOR



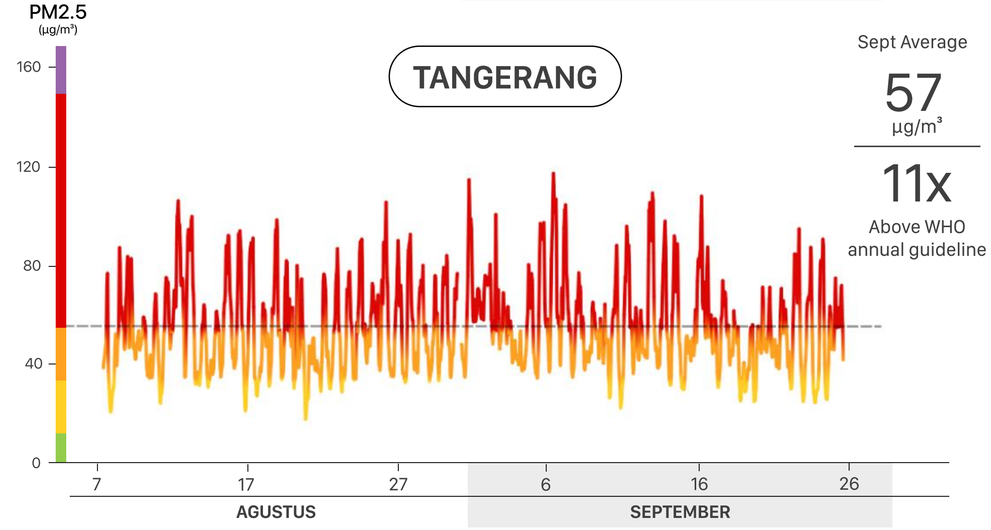
Sept Average
48
µg/m³
9x
Above WHO annual guideline

DEPOK



Sept Average
45
µg/m³
9x
Above WHO annual guideline

TANGERANG



Sept Average
57
µg/m³
11x
Above WHO annual guideline

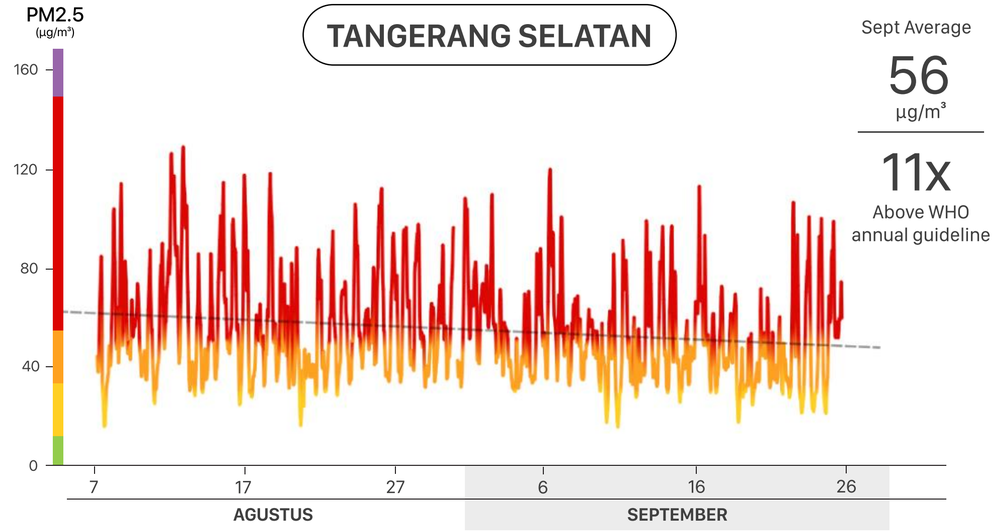
Good · Moderate · Unhealthy for Sensitive Groups · Unhealthy · Very Unhealthy

*) Pedoman WHO = batas paparan tahunan

INSIGHT
№ 2

The trend is declining, but pollution remained high in September

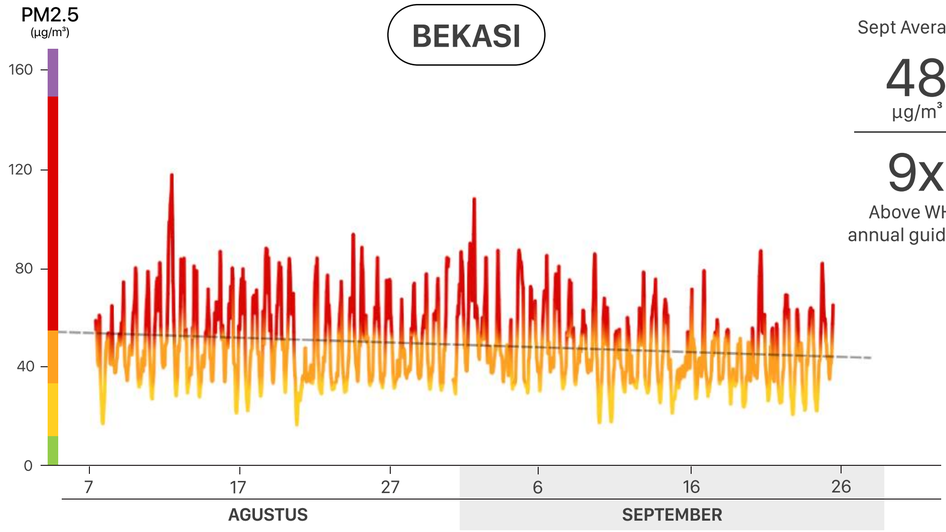
TANGERANG SELATAN



Sept Average
56
µg/m³

11x
Above WHO annual guideline

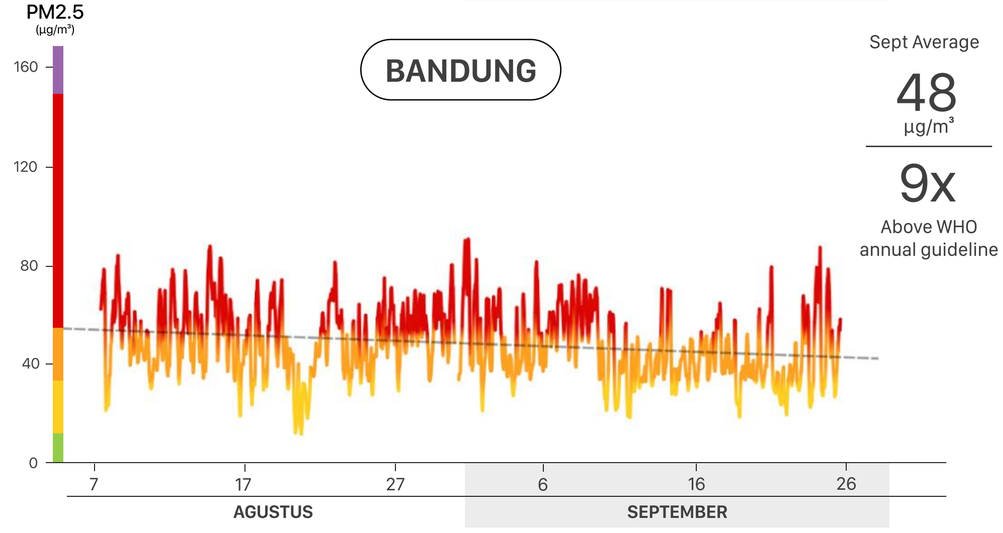
BEKASI



Sept Average
48
µg/m³

9x
Above WHO annual guideline

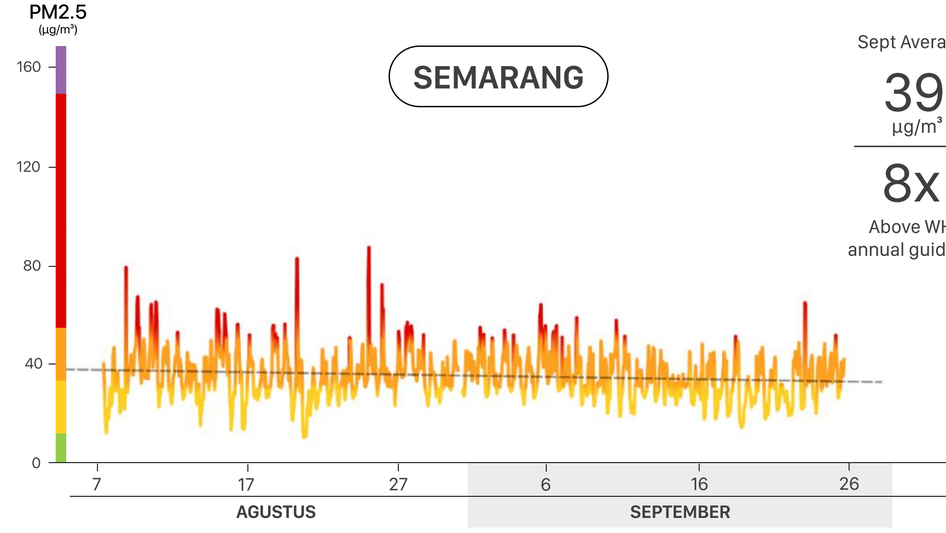
BANDUNG



Sept Average
48
µg/m³

9x
Above WHO annual guideline

SEMARANG



Sept Average
39
µg/m³

8x
Above WHO annual guideline

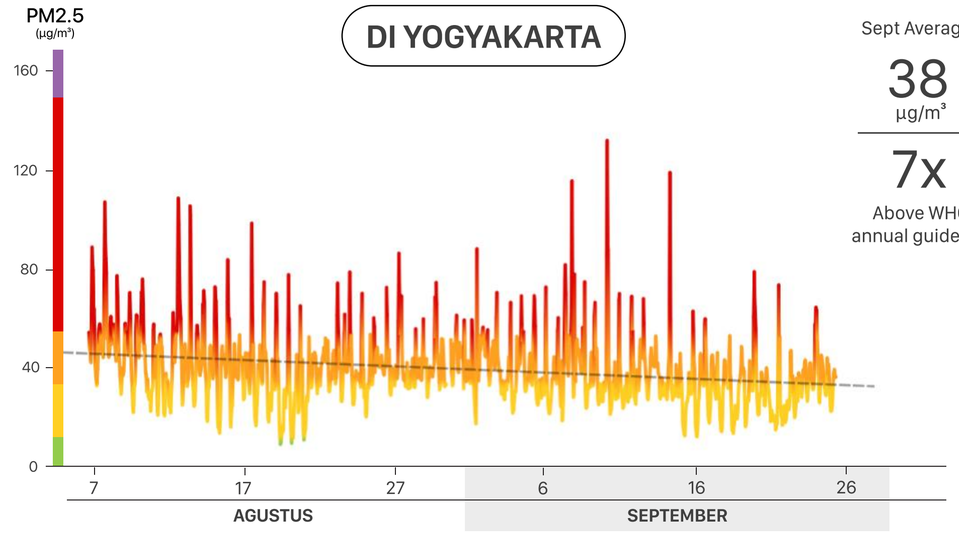
Good · Moderate · Unhealthy for Sensitive Groups · Unhealthy · Very Unhealthy

*) Pedoman WHO = batas paparan tahunan

INSIGHT
№ 2

The trend is declining, but pollution remained high in September

DI YOGYAKARTA

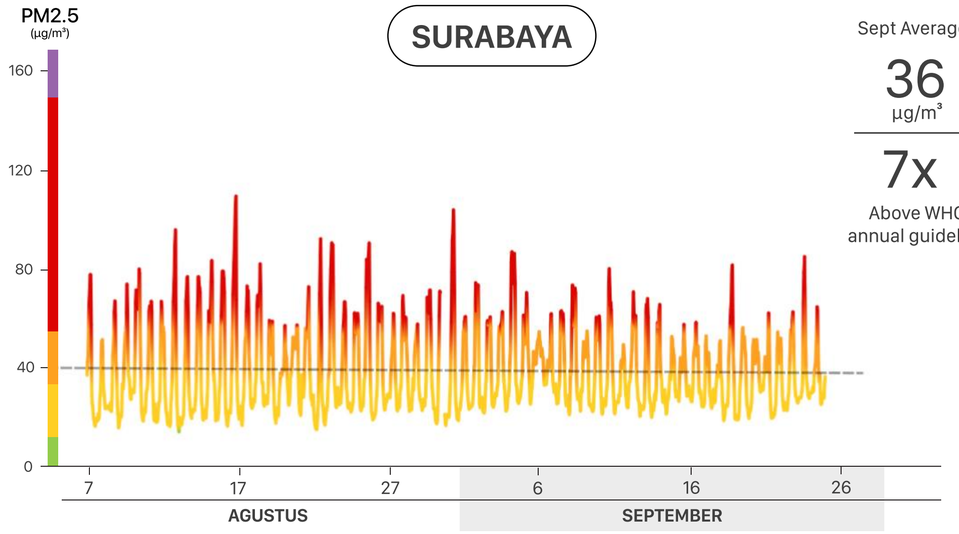


Sept Average

38
µg/m³

7x
Above WHO
annual guideline

SURABAYA

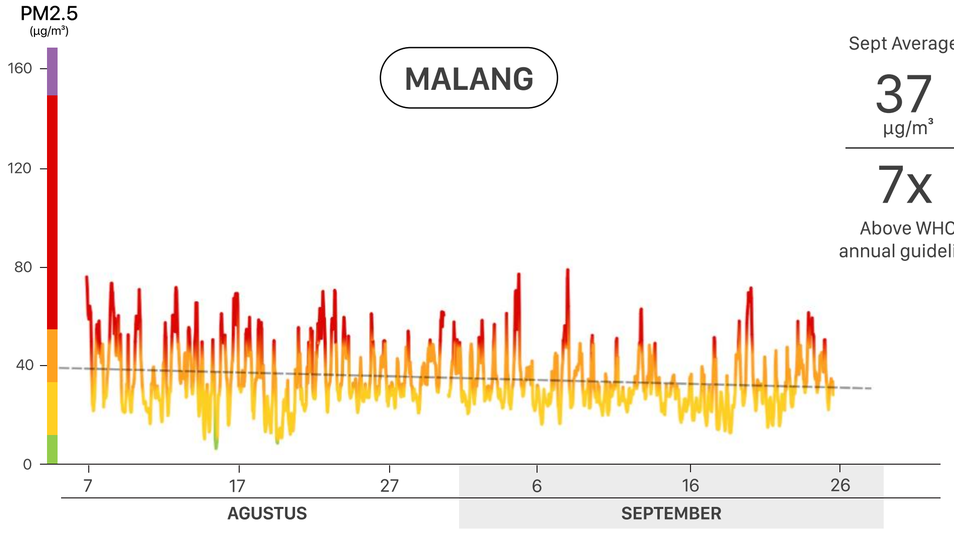


Sept Average

36
µg/m³

7x
Above WHO
annual guideline

MALANG



Sept Average

37
µg/m³

7x
Above WHO
annual guideline

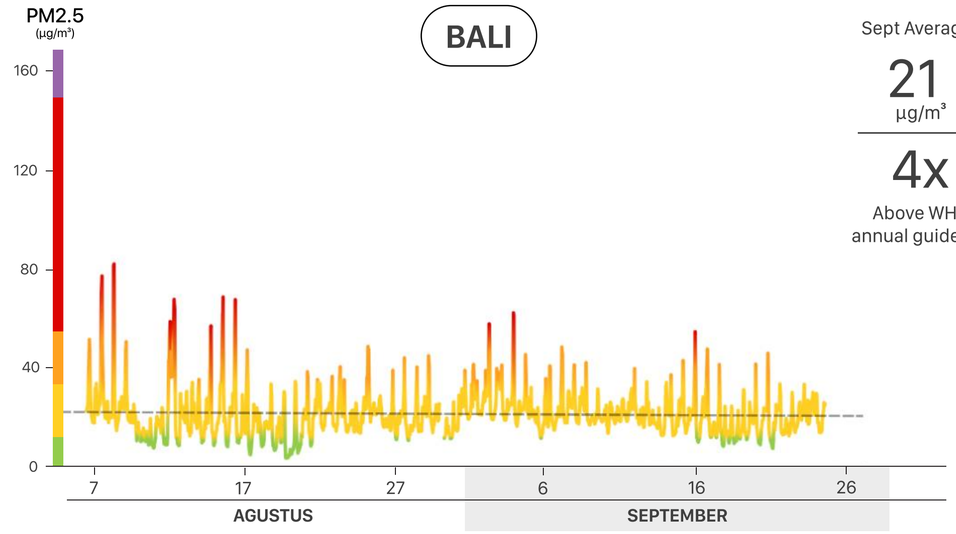
Good · Moderate · Unhealthy for Sensitive Groups · Unhealthy · Very Unhealthy

*) Pedoman WHO = batas paparan tahunan

INSIGHT
№ 2

The trend is declining, but pollution remained high in September

BALI



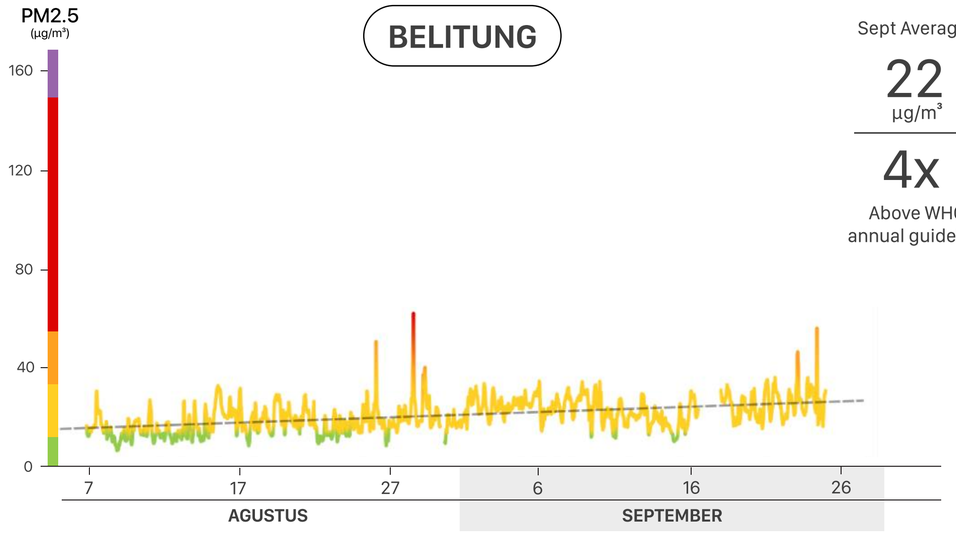
Sept Average

21 µg/m³

4x

Above WHO annual guideline

BELITUNG



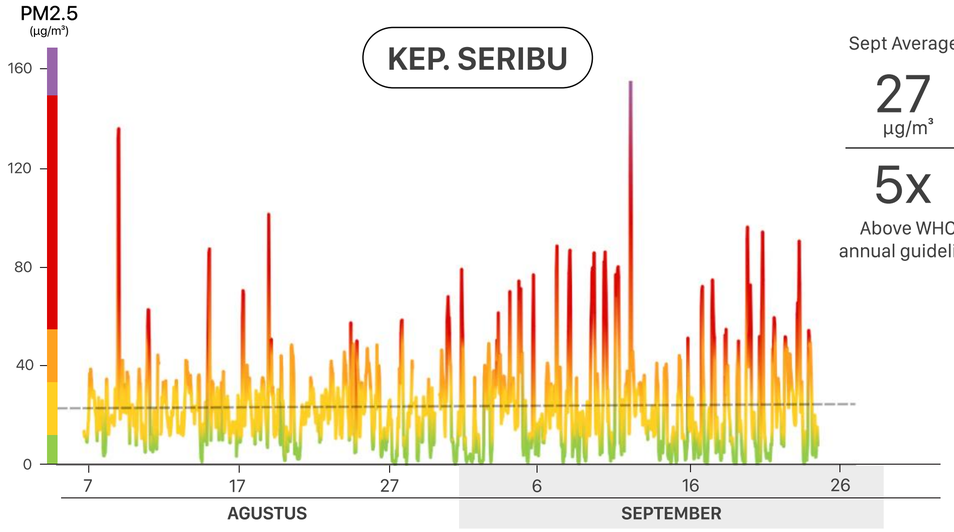
Sept Average

22 µg/m³

4x

Above WHO annual guideline

KEP. SERIBU



Sept Average

27 µg/m³

5x

Above WHO annual guideline

Good | Moderate | Unhealthy for Sensitive Groups | Unhealthy | Very Unhealthy

*) Pedoman WHO = batas paparan tahunan

INSIGHT
№ 3

Nafas and Halodoc Collaborative Study

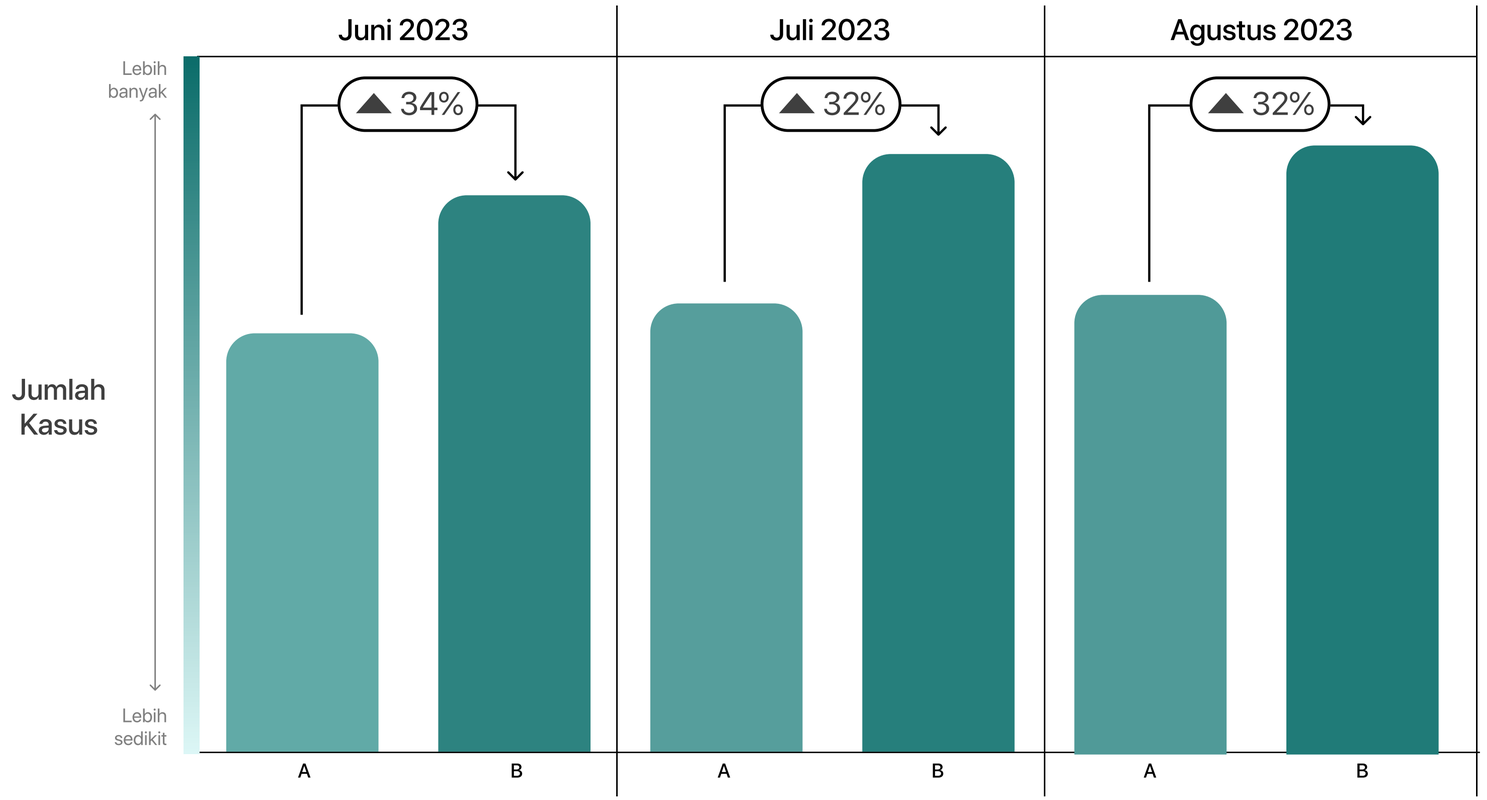
Nafas recently released a joint report with Halodoc on Tuesday, 26th September 2023. This report presents various findings related to air pollution components and how they impact our short-term health.

This report constitutes a limited study, utilizing PM2.5 data from Nafas and respiratory disease cases from Halodoc, specifically for the Jabodetabek area during the June-August 2023 period.

Some key findings from this collaborative study:

😷 **For every 10 µg/m³ increase in PM2.5 (with a baseline of 31 µg/m³), respiratory disease cases rise by up to 34%.**

Respiratory Disease Cases Average, Before and After an Increase of PM2.5 by 10 µg/m³

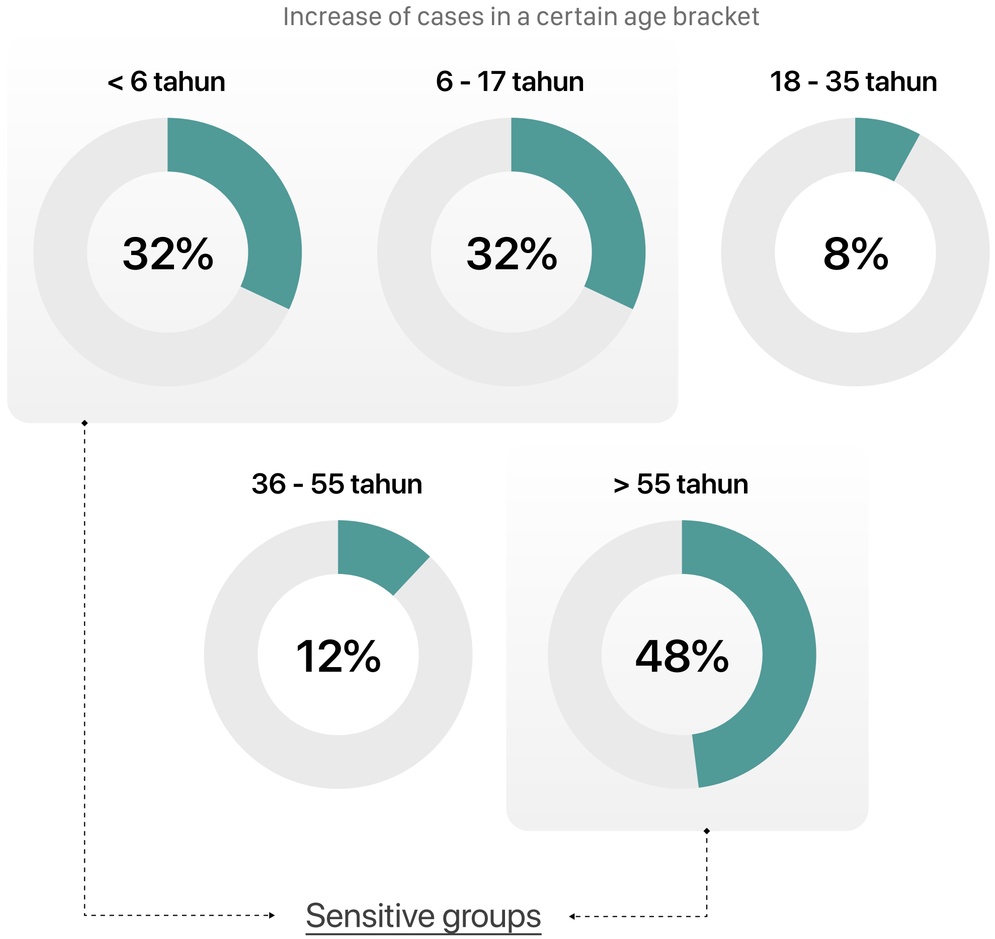


A = Number of cases if the average of PM2.5 level is low
B = Number of cases if PM2.5 level increases by 10 µg/m³

INSIGHT
№ 3

Nafas and Halodoc Collaborative Study

👶🧓 Sensitive or vulnerable groups face the highest risk of respiratory problems, with an increase in cases by up to 48%.



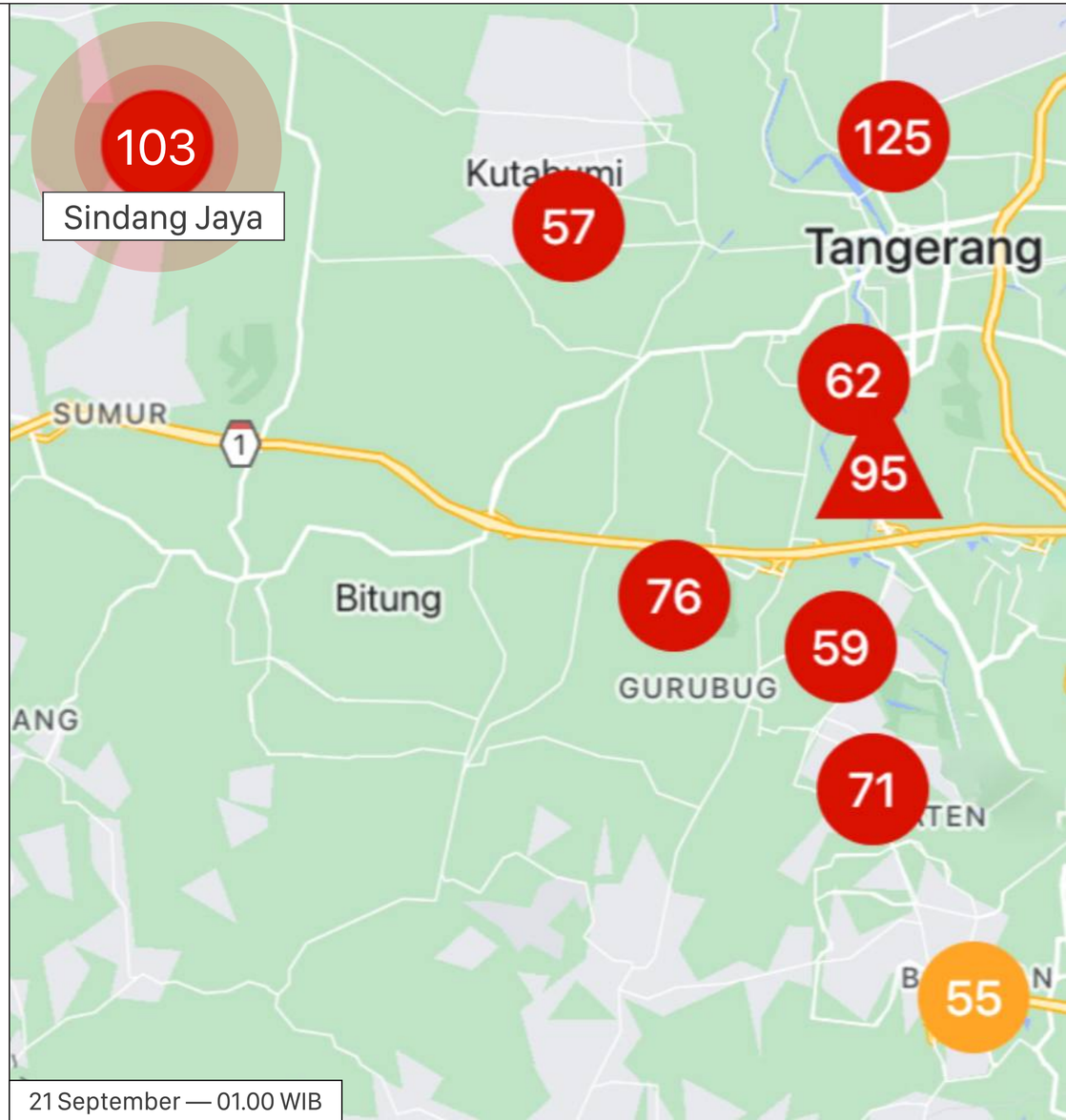
Download Nafas & Halodoc study report now!
Available in Indonesian & English.

INSIGHT
№ 4

Can a surge in pollution in one area affect the air quality in a specific region?

There have been numerous complaints about routine burning activities in the Sindang Jaya area, which have adversely affected the neighboring residents. Billowing black smoke has become a daily sight for them.

The local residents have collectively investigated the issue, as it's been a long time since they and their families could breathe clean air. Upon further investigation, it appears that the potential source of the high pollution stems from burning activities by local industries and the nearby residents.

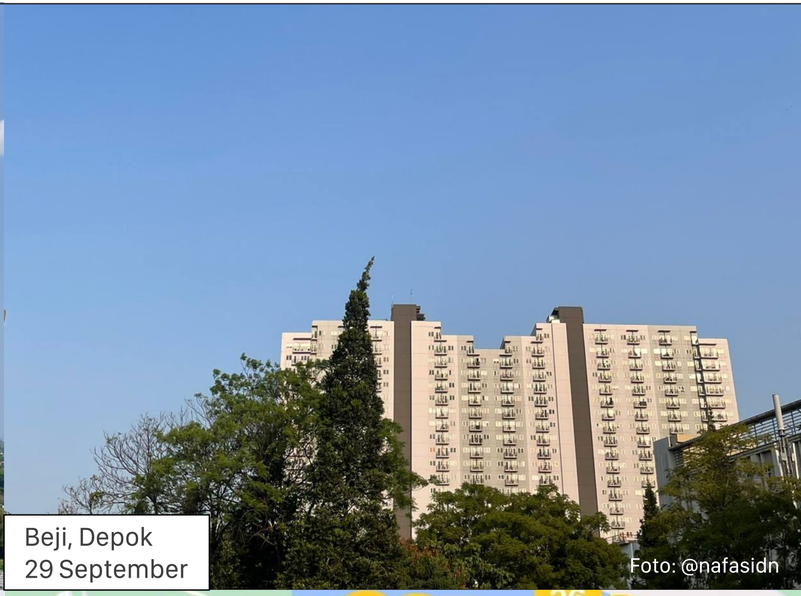


INSIGHT
№ 5

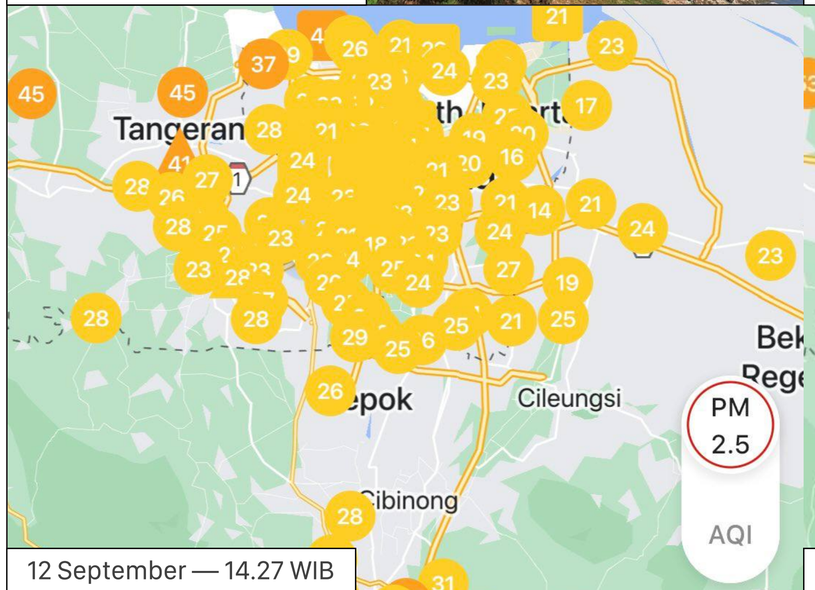
Rare sight in Jabodetabek: Clear blue skies

Tanah Abang, Jakarta Pusat
12 September

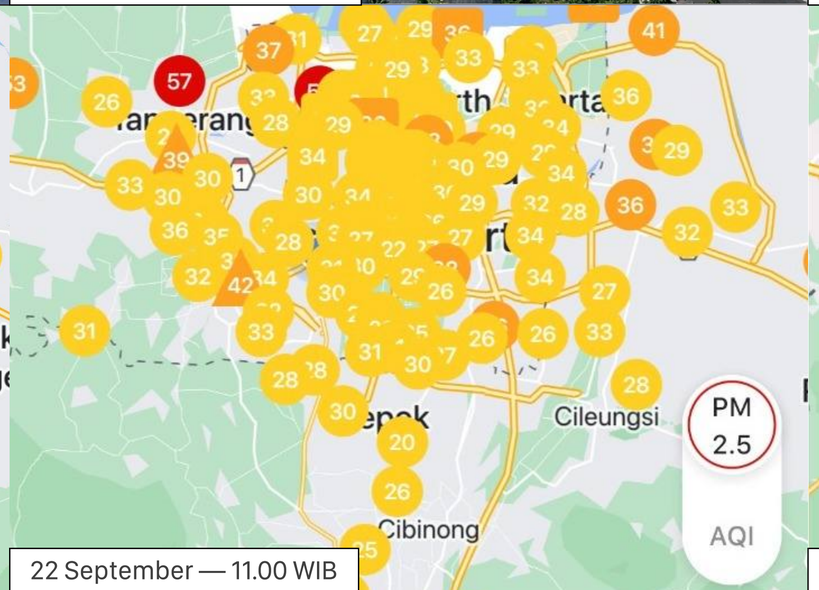
Bintaro, Tangerang Selatan
22 September



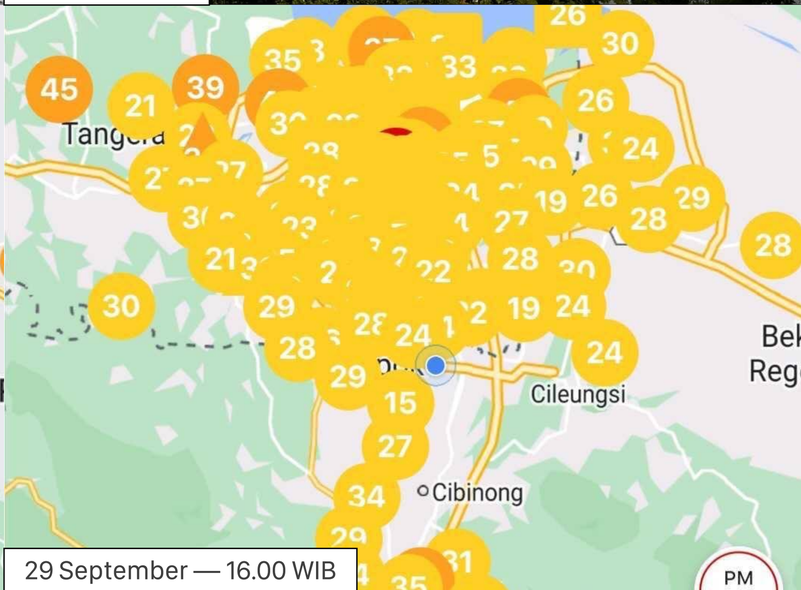
Beji, Depok
29 September



12 September — 14.27 WIB



22 September — 11.00 WIB



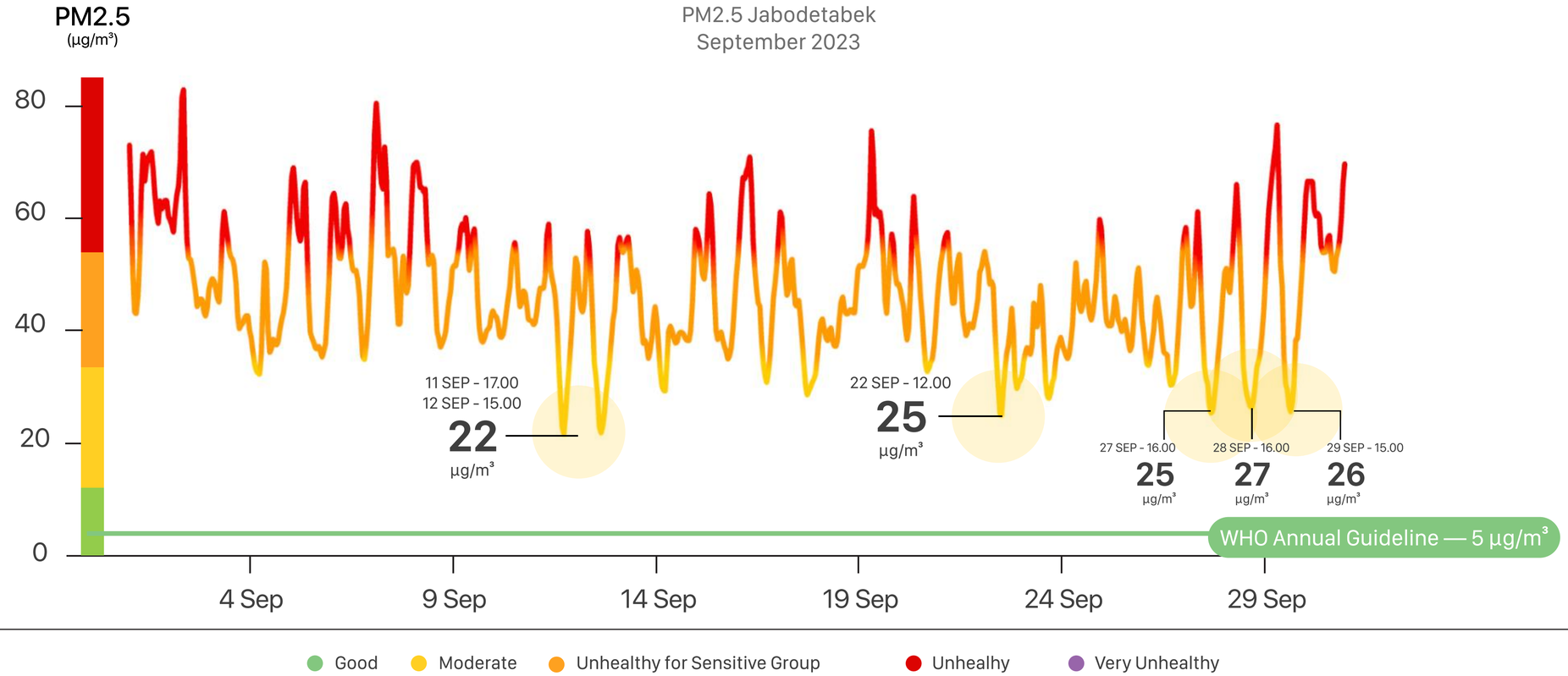
29 September — 16.00 WIB

INSIGHT
№ 6

What caused the blue skies over Jabodetabek?

Last September, there were moments when Jabodetabek enjoyed relatively good air quality in the late morning to early evening. According to Nafas monitoring, these episodes of moderate air quality revealed that **the lowest PM2.5 levels occurred during the midday to early evening, with concentrations ranging from 22 to 26 µg/m³ between 11:00 and 17:00.**

With varying hourly PM2.5 concentrations, **aided by wind speeds of 7 to 10 m/s**, the skies over Jabodetabek during these times appeared noticeably clear and beautifully blue.



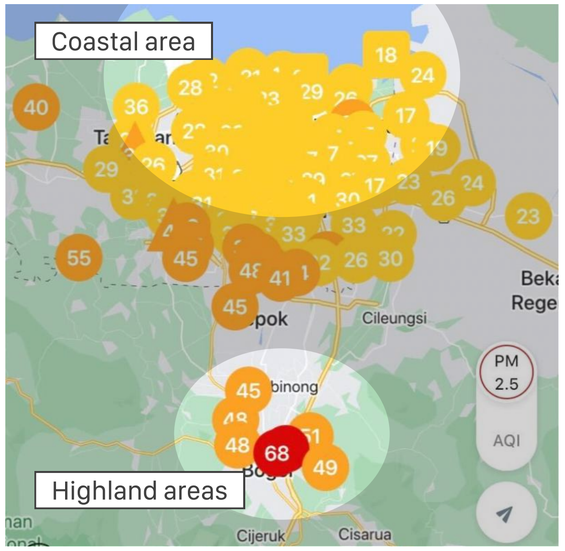
INSIGHT
№ 7

Jakarta's coastal areas have lower pollution than the highland regions.

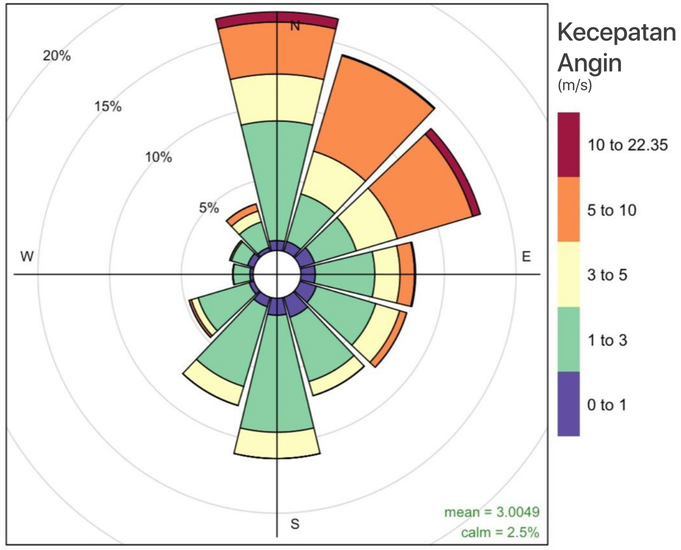
Throughout September, the number of "Unhealthy" (for both the general populace and sensitive groups) hours in the **highland or southern areas of Jabodetabek** (Bogor District and City) was more frequent than in the **coastal or northern areas of Jabodetabek** (North Jakarta). This is due to the frequent and strong winds coming from the North, which effectively 'push' pollutants in the wind's direction.

For the best times to engage in outdoor activities, it is advisable to choose periods when the air quality is on average fairly good, which is typically in the late afternoon. However, given the highly fluctuating levels of pollution, continuously monitor the air quality using the Nafas app.

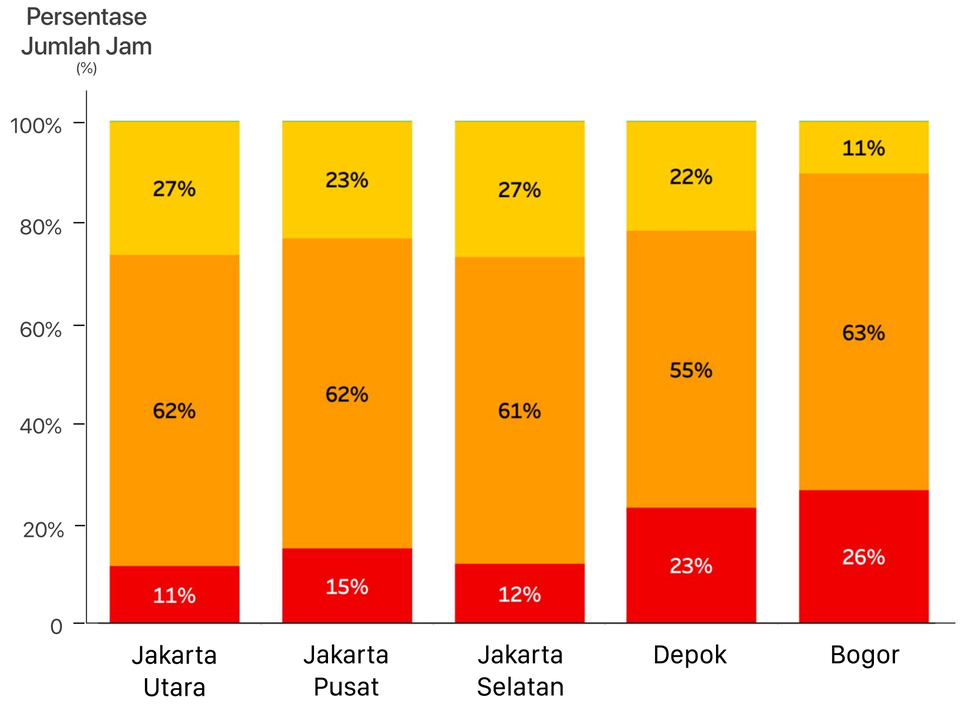
Jabodetabek air quality



Strong winds came from the North and East quadrants



Percentage of hours based on air quality categories



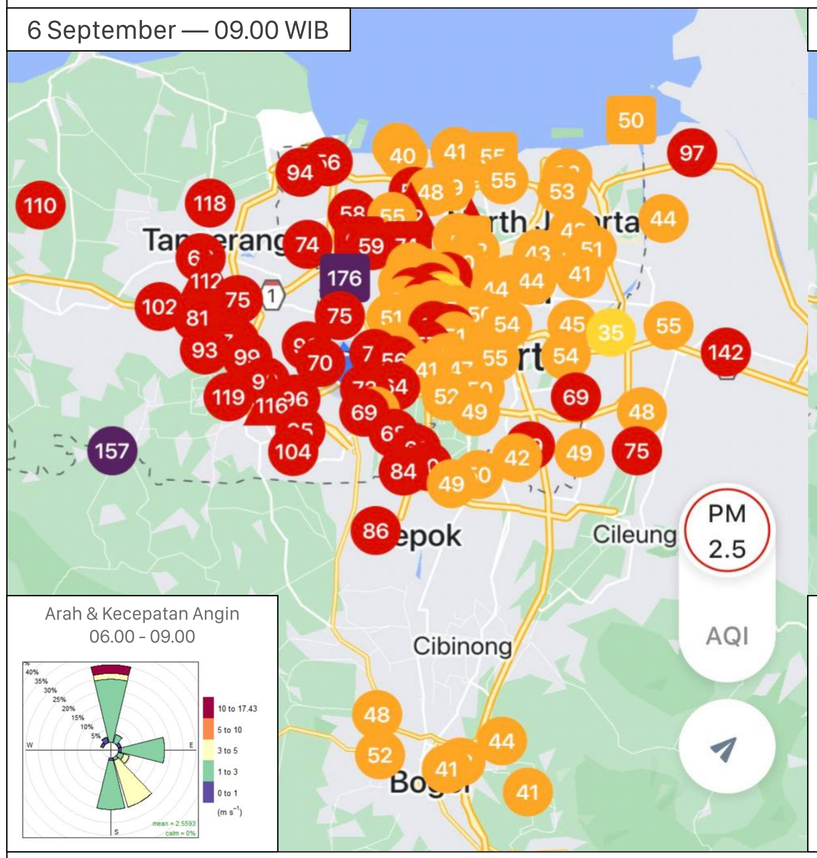
Good · Moderate · Unhealthy for Sensitive Group · Unhealthy · Very Unhealthy

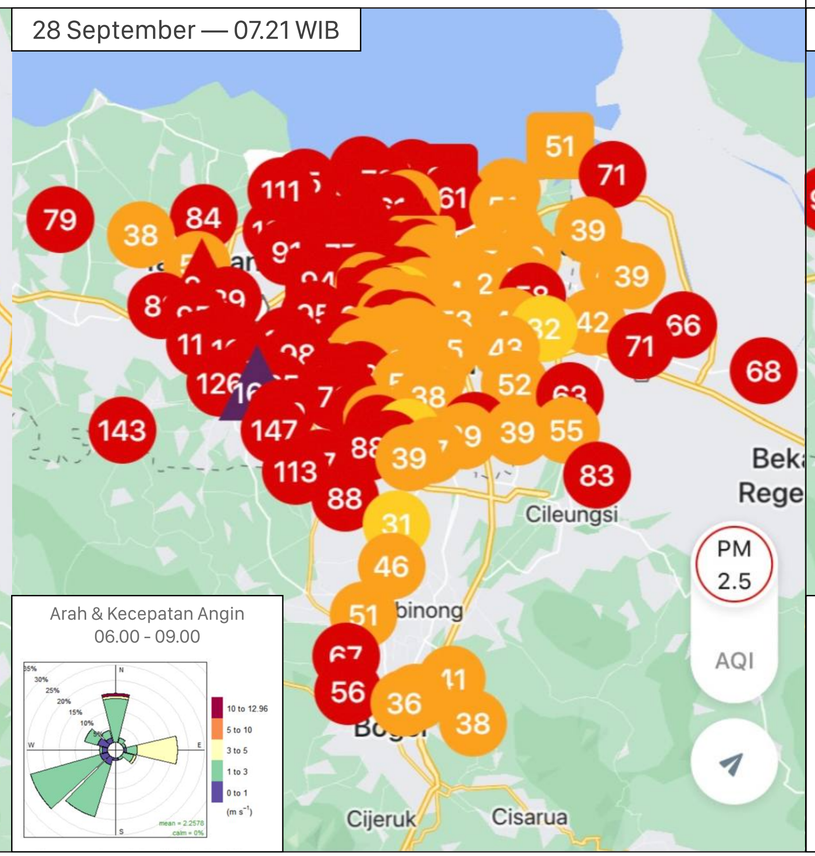
INSIGHT
№ 8

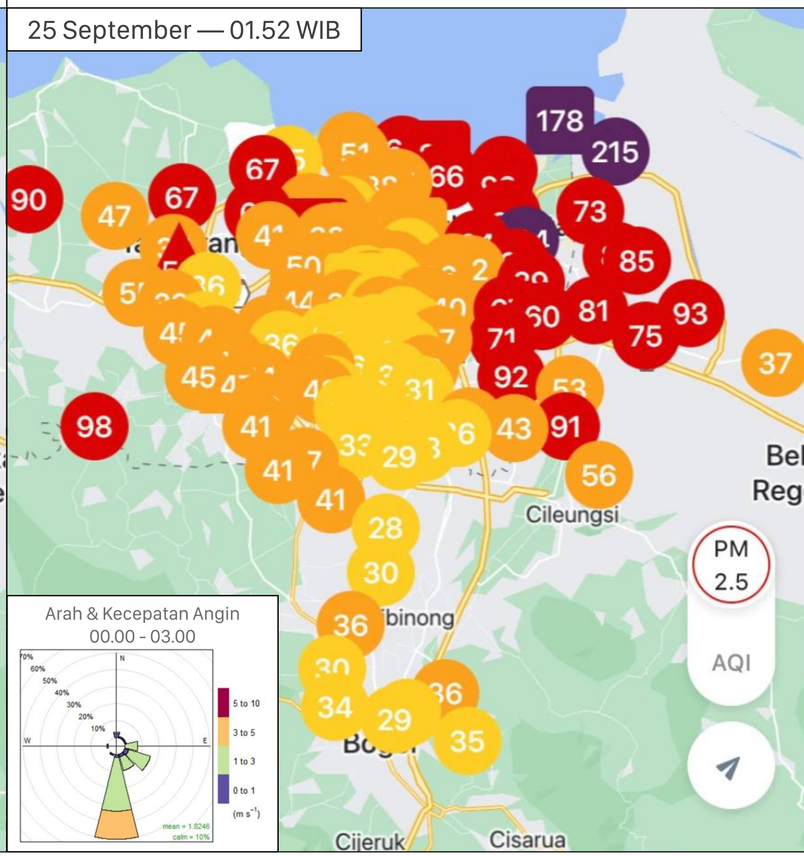
"Yin-Yang" & Other Unique Patterns in Jabodetabek

At certain times, the western side of Jabodetabek appears more polluted than the eastern side. This distinction is influenced by various atmospheric conditions, especially the wind direction, which comes from different directions during specific periods.

On the other hand, observing the "Color Index" with its varied transitions, there's a noticeable dominant wind direction coming from the southern to eastern quadrants.







Good · Moderate · Unhealthy for Sensitive Group · Unhealthy · Very Unhealthy

INSIGHT
№ 9

Forest and Land Fire Emergency, A Serious Threat to Public Health

Forest and land fires, often referred to as "karhutla," are rampant in many areas, especially on the islands of Sumatra and Kalimantan. Cities such as **Palembang, Jambi, Banjarmasin, Palangkaraya,** and **Sampit** are among the most affected.

Palembang Rivals Jambi for Indonesia's Worst Air Quality Status, Discover the Reasons

CNN Indonesia

Senin, 25 Sep 2023 12:31 WIB

Salah satu titik kebakaran hutan dan lahan di Sumsel, Ogan Ilir, belum lama ini. Efek langsungnya adalah udara buruk. (ANTARA FOTO/NOVA WAHYUDI)

CNN Indonesia,
25 September 2023

Jambi Residents Complain About the Effects of Smoke Haze: Stinging Eyes, Difficulty Breathing

Ferdi Almunanda - detikSumbagsel

Kamis, 28 Sep 2023 10:20 WIB

Kabut asap menyelimuti Kota Jambi mulai dikeluhkan warga (Foto: Ferdi Al Munanda)

Detik.com,
28 September 2023

Eyes Sting, Smoke Haze in Banjarmasin Worsens

Banjarmasin kasus tertinggi ISPA di Kalimantan Selatan

Kondisi udara di Banjarmasin semakin parah akibat tercemar kabut asap.

IDN Times,
28 September 2023

Smoke Haze Thickens in Palangkaraya, City Activities Disrupted

KOMPAS/DIONISIUS REYNALDO TRIWIBOWO

Serasah terbakar hingga jadi abu di Desa Tanjung Taruna, Kabupaten Pulang Pisau, Kalimantan Tengah, pada Kamis (28/9/2023). Kebakaran hutan dan lahan terjadi hampir di tiap wilayah dan petugas pun tampak kewalahan menghadapinya. Karhutla mulai mendekati fasilitas publik hingga pemukiman warga.

Kompas.id,
28 September 2023

Rampant Forest Fires Continue to Affect Sampit and Palangkaraya

Jumat, 29 September 2023

SELIMUT ASAP: Pemandangan Kota Palangka Raya dari Jembatan Kahayan yang diselimuti asap. (DODI/RADAR SAMPIT)

Radar Sampit,
29 September 2023

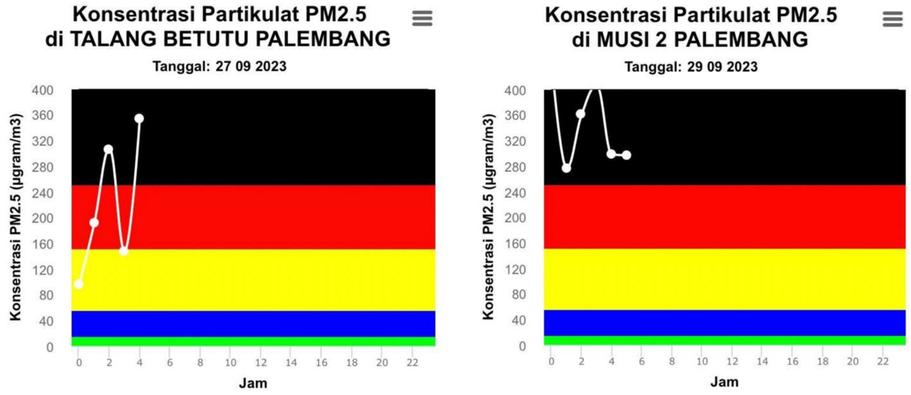
INSIGHT
№ 10

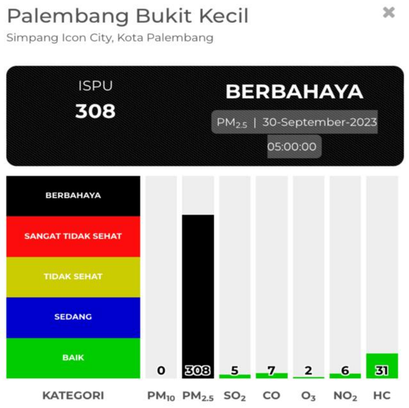
Forest and Land Fire Emergency, A Serious Threat to Public Health

The Nafas sensor network has not yet covered these areas. However, according to the air quality monitoring results from ISPU KLHK and BMKG, the air quality ranges from categories such as **"Unhealthy," "Very Unhealthy,"** to **"Hazardous."**

PALEMBANG

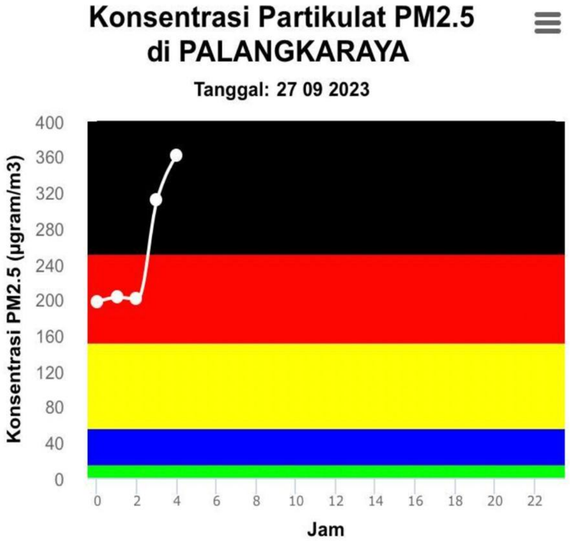
Date of Monitoring
27, 29 dan 30 September

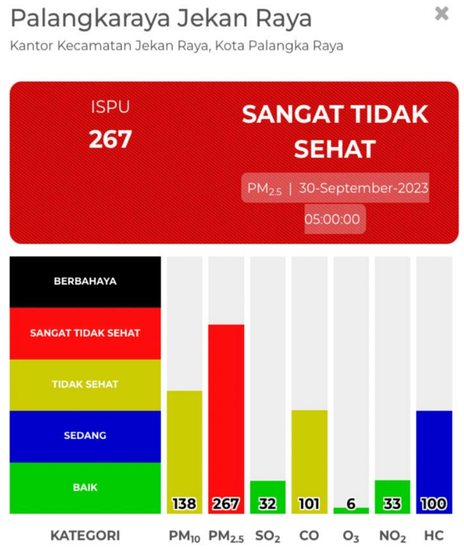




PALANGKARAYA

Date of Monitoring:
27, dan 30 September





Baik Sedang Tidak Sehat Sangat Tidak Sehat Berbahaya

INSIGHT
№ 11

Potential Contribution of Forest and Land Fires to Air Quality in Other Regions

Forest fires in various areas around Mount Lawu have been ongoing since August 30, 2023. Initially, 3-9 hectares of land were affected, but as of now, the fires have spread to encompass around 2000 hectares*. Currently, there are no Nafas sensors located near Mount Lawu. However, based on the modeling data as of October 9th, **there seems to be a potential movement of pollutants towards the nearest Nafas** sensor region, which is D.I. Yogyakarta.

This suggests the potential contribution of the Mount Lawu forest fires to air pollution in other areas (transboundary pollution), especially in D.I. Yogyakarta and its surroundings during specific times and days when atmospheric conditions are conducive.

*Source: Detik.com, Kompas

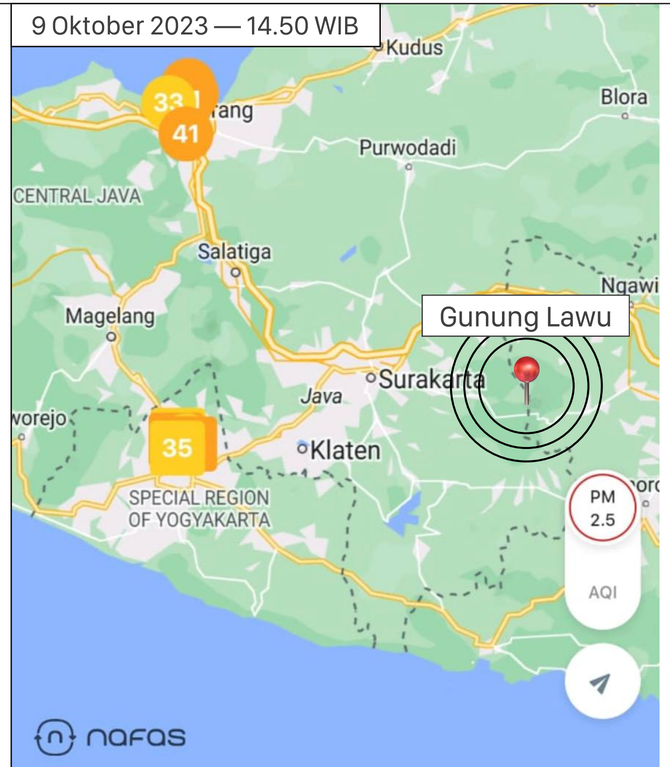
BNPB, 30 September 2023

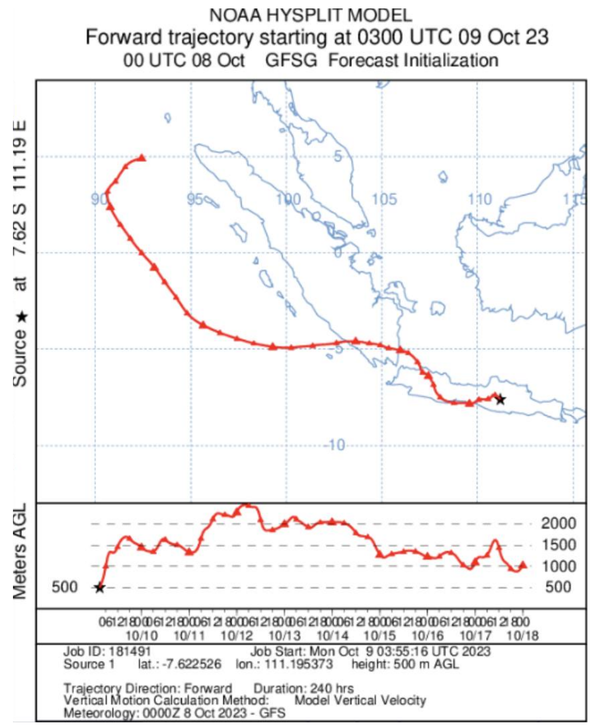
Seluas 30 Hektar Lahan Gunung Lawu Terbakar

30 Sep 2023 11:25 WIB

Dilihat 518 kali

9 Oktober 2023 — 14.50 WIB



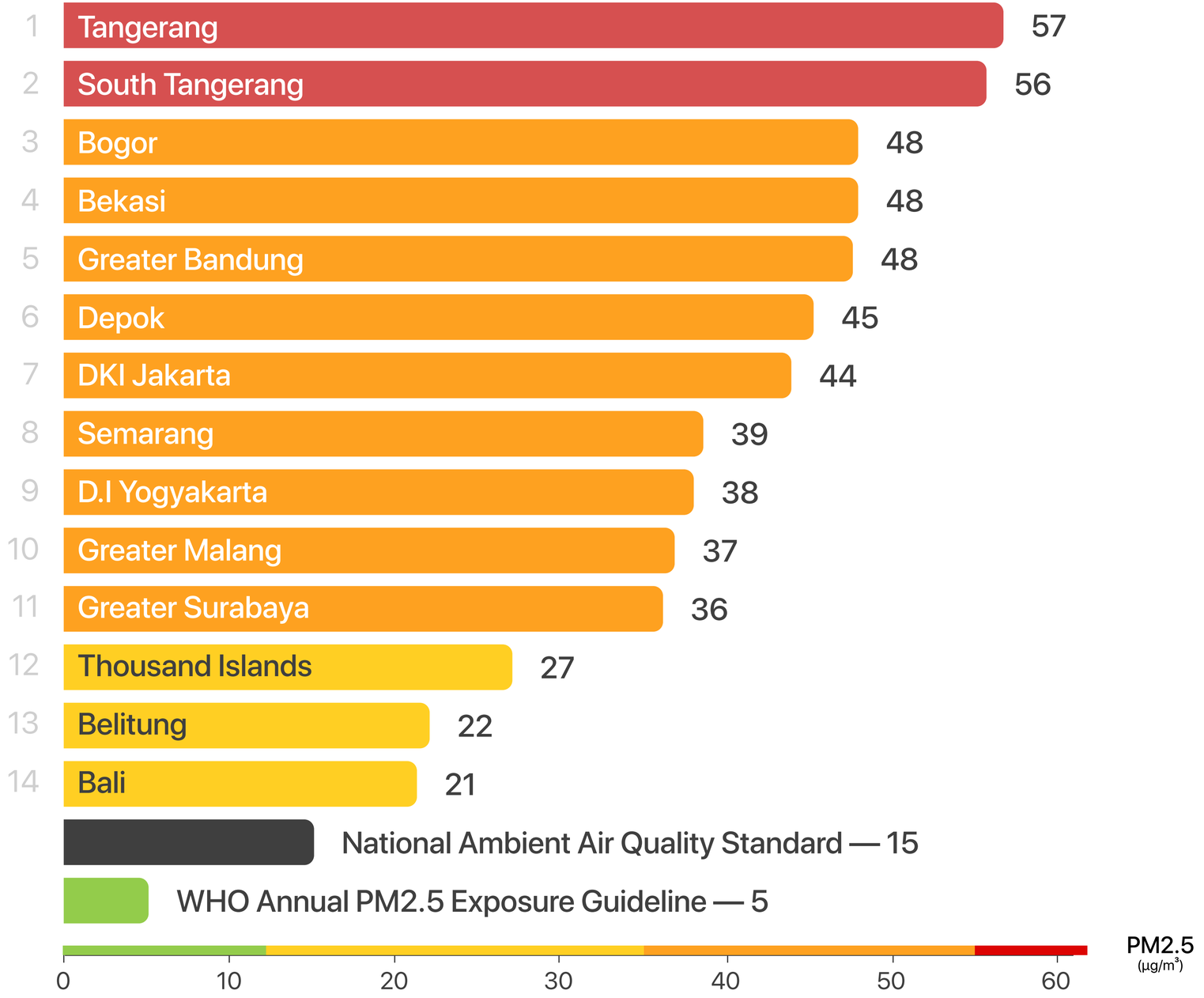


04

city overview

City Rankings

This ranking is determined by the cities with the highest PM2.5 concentration levels in September 2023.



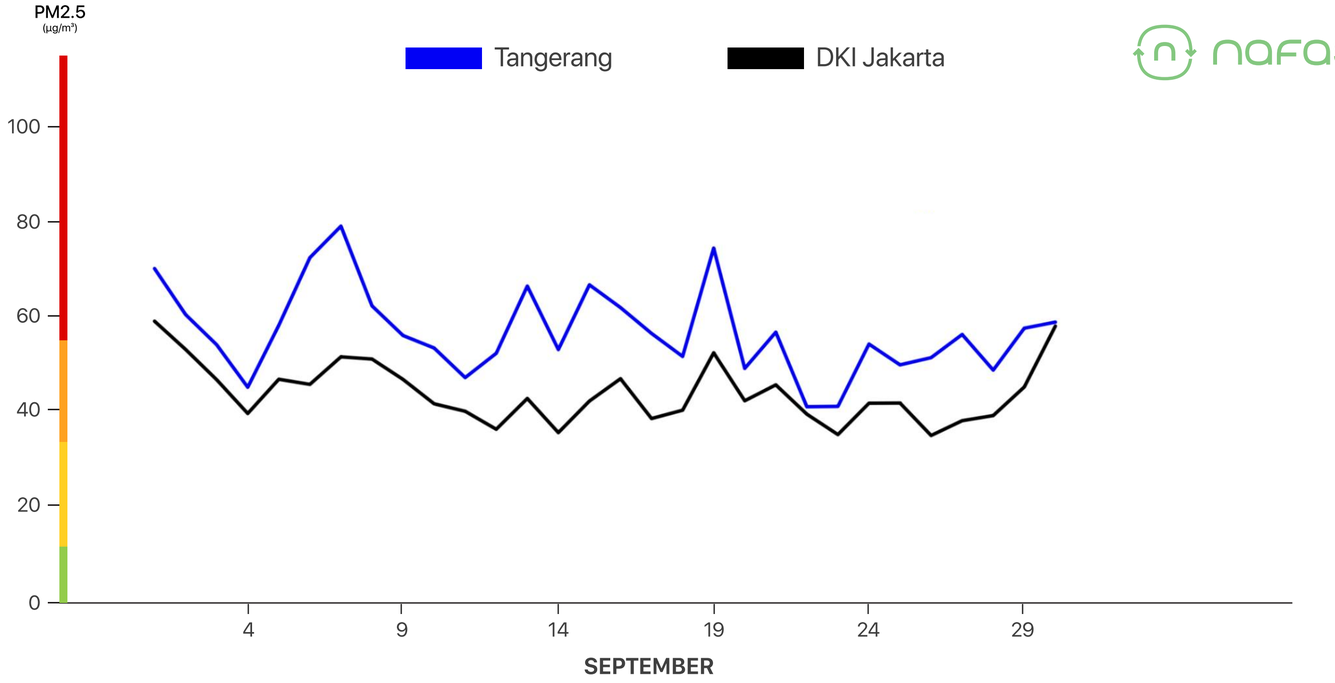
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

Tangerang
September 2023

Last September, **Tangerang emerged as the most polluted area** in the Nafas sensor network, overtaking South Tangerang, which had held the top spot for several months. This is, of course, an "achievement" that no region would wish to claim.

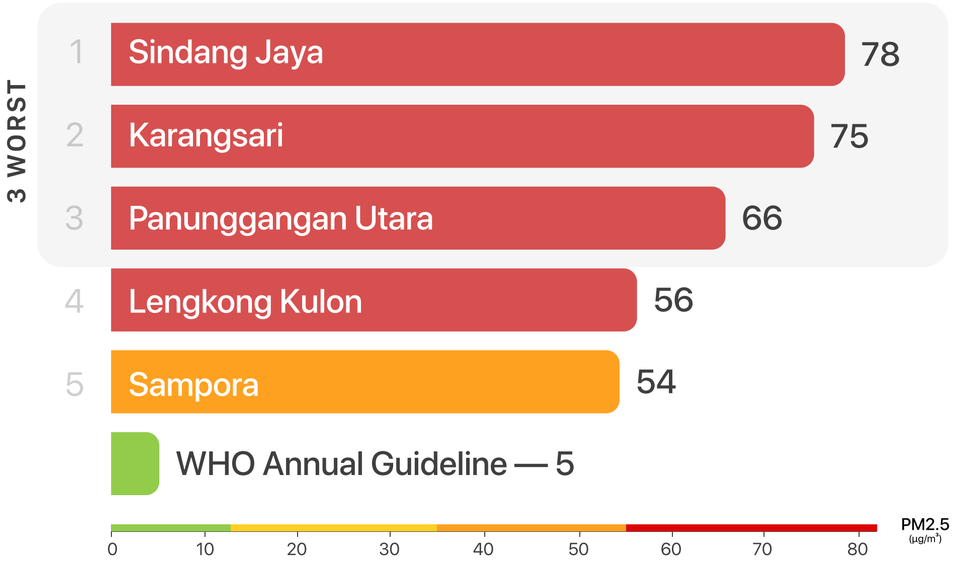
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

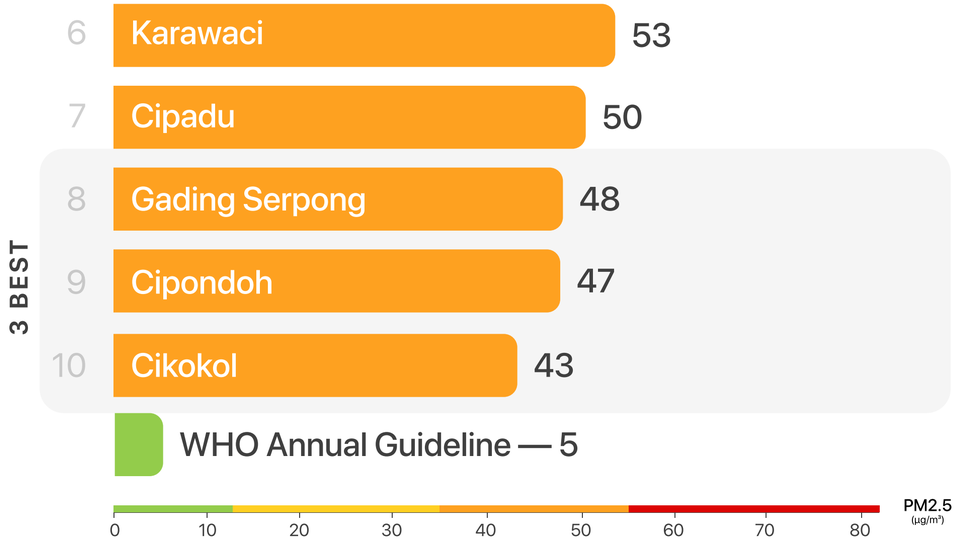
TANGERANG VS DKI JAKARTA



29%

Worse than DKI Jakarta





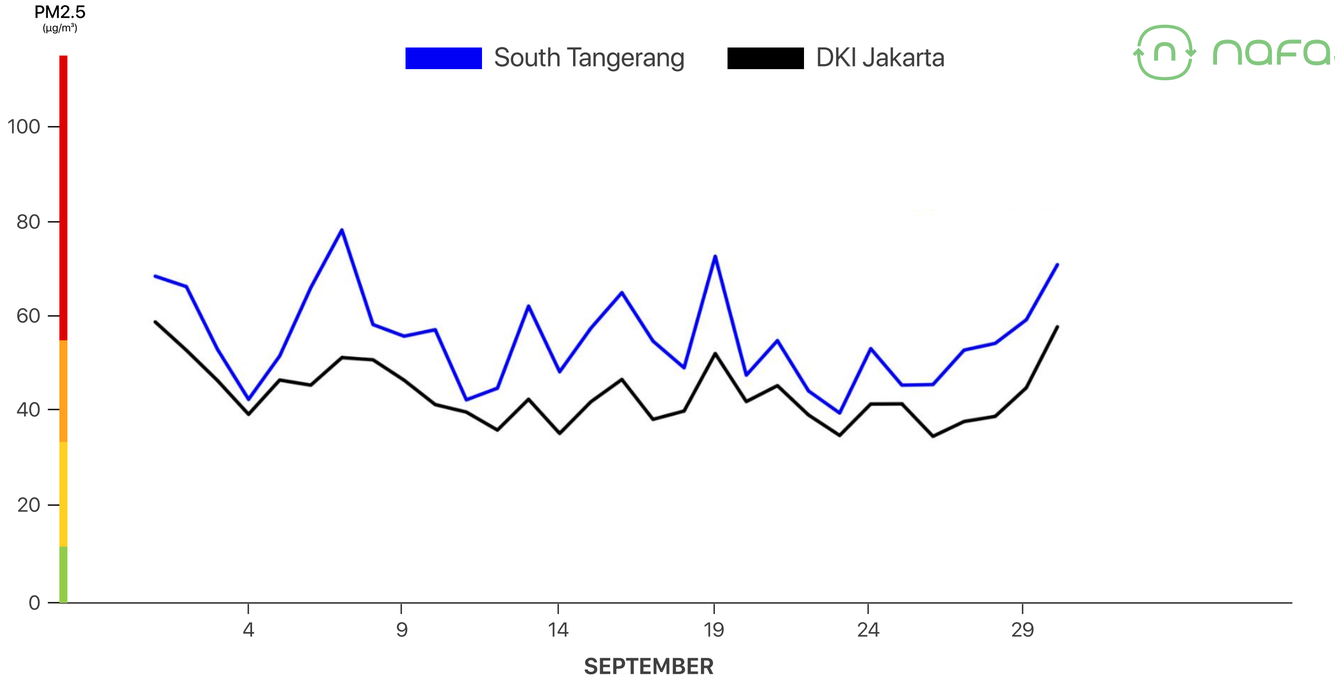
South Tangerang

September 2023

Pushed to second place as the most polluted area, South Tangerang's average monthly PM2.5 level in September remained high. Serpong continues to be the region with the highest monthly pollution level, reaching 72 µg/m³, which is 14 times higher than the WHO's annual guidelines.

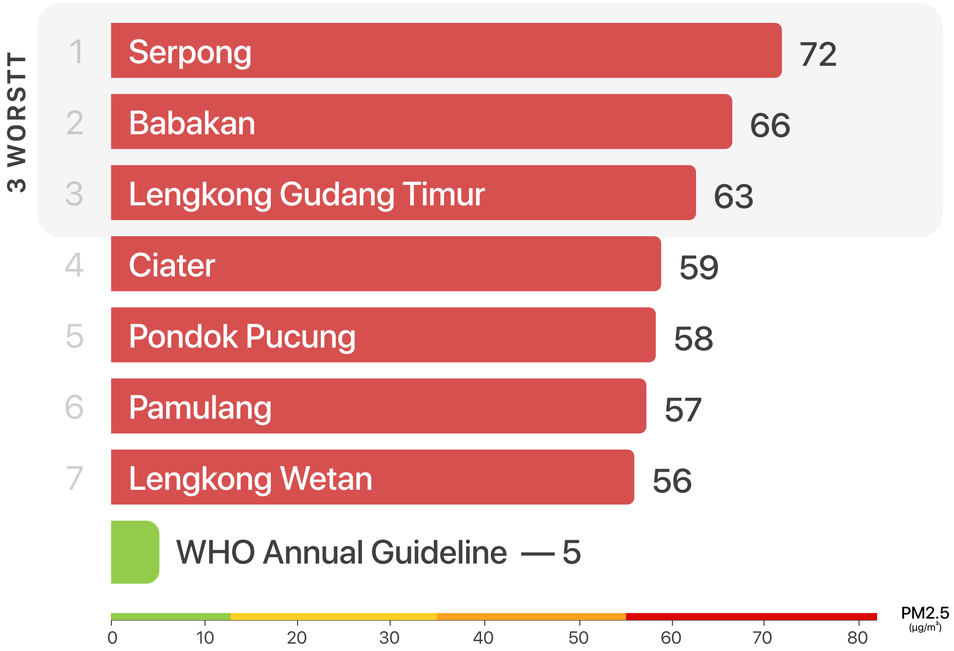
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

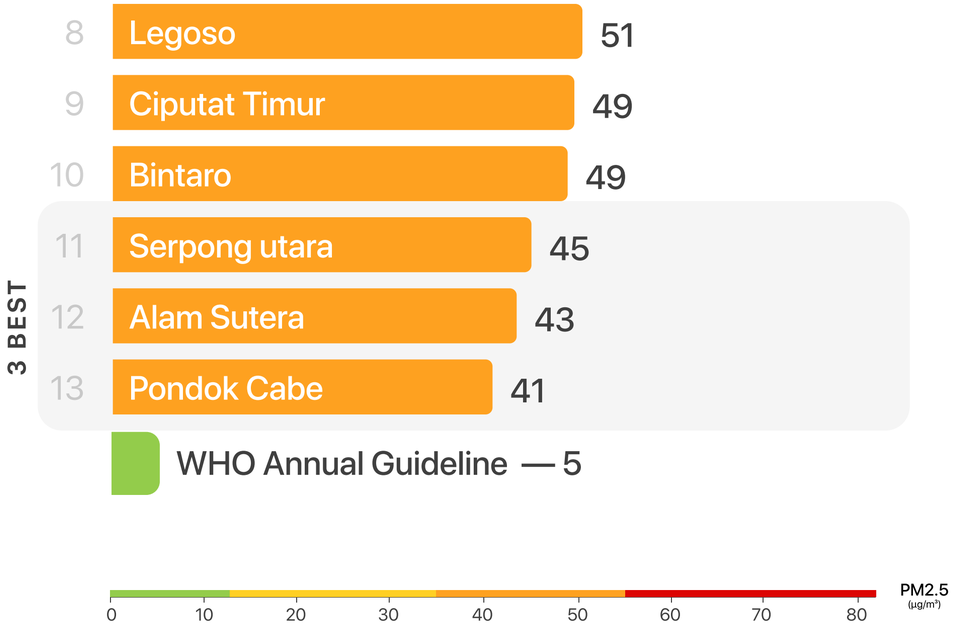
SOUTH TANGERANG VS DKI JAKARTA



27%

Worse than DKI Jakarta





Bogor

September 2023

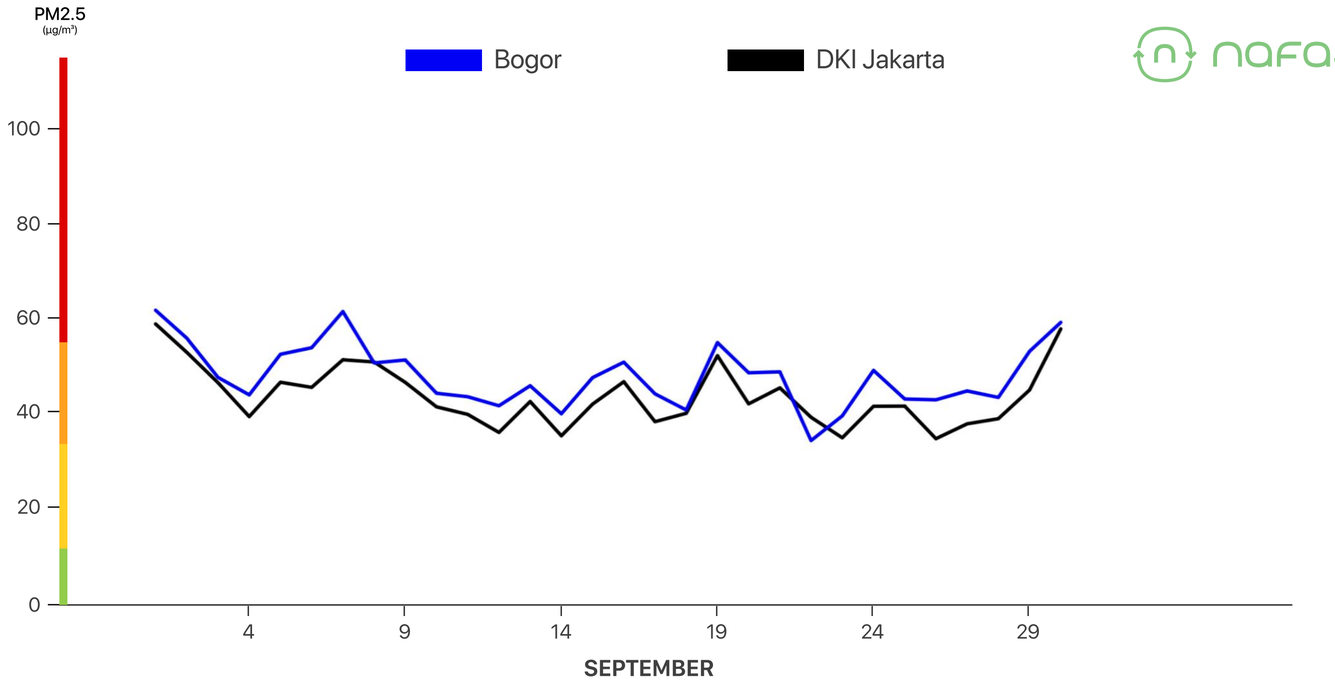
Goodbye to Bogor's image as a pollution-free city. Even though its average monthly pollution levels have decreased, the PM2.5 concentrations in various parts of Bogor remain high, especially in Parung Panjang, which reached 74 µg/m³—15 times above the WHO's annual guidelines.

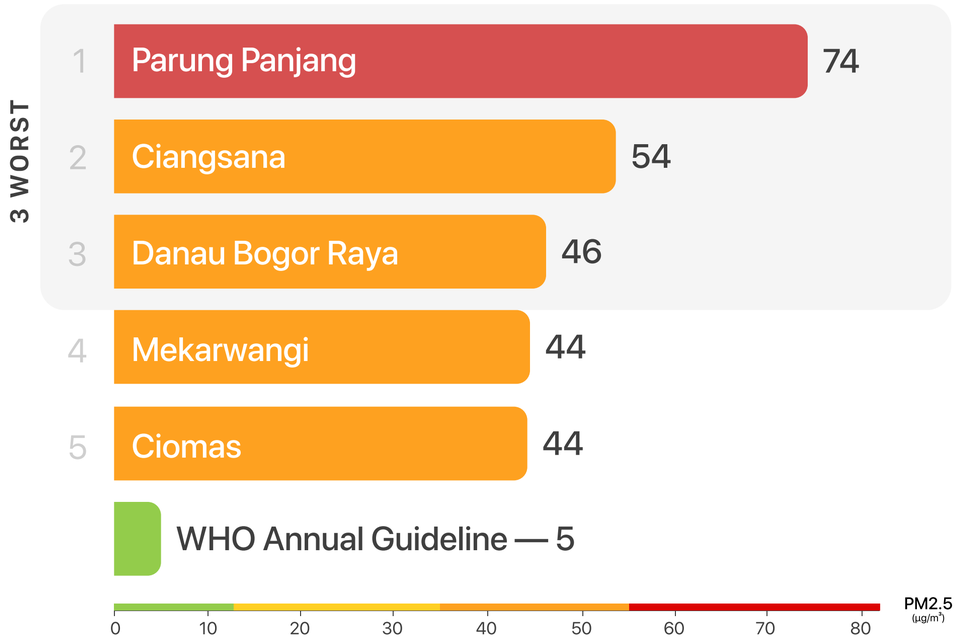
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

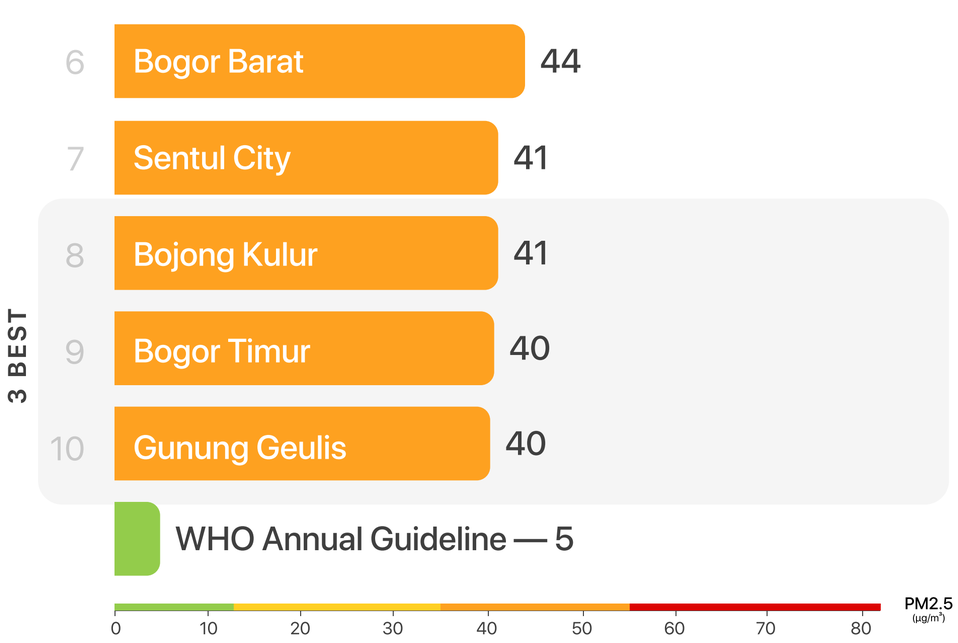
BOGOR VS DKI JAKARTA

9%

Worse than DKI Jakarta







Bekasi

September 2023

Ranked fourth as the most polluted area, Bekasi's air quality in September was slightly worse compared to DKI Jakarta.

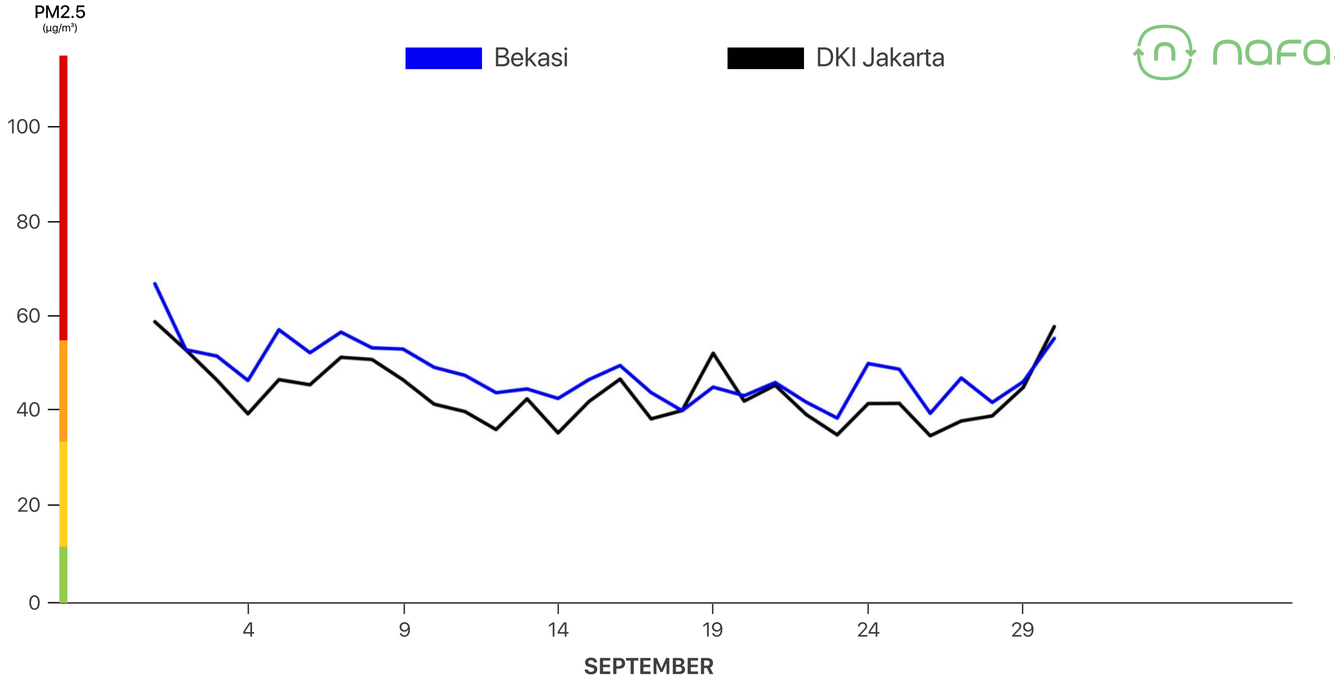
Congratulations to Jatibening for being the sole region with an average air quality categorized as **"Moderate" (Fairly Good)!**

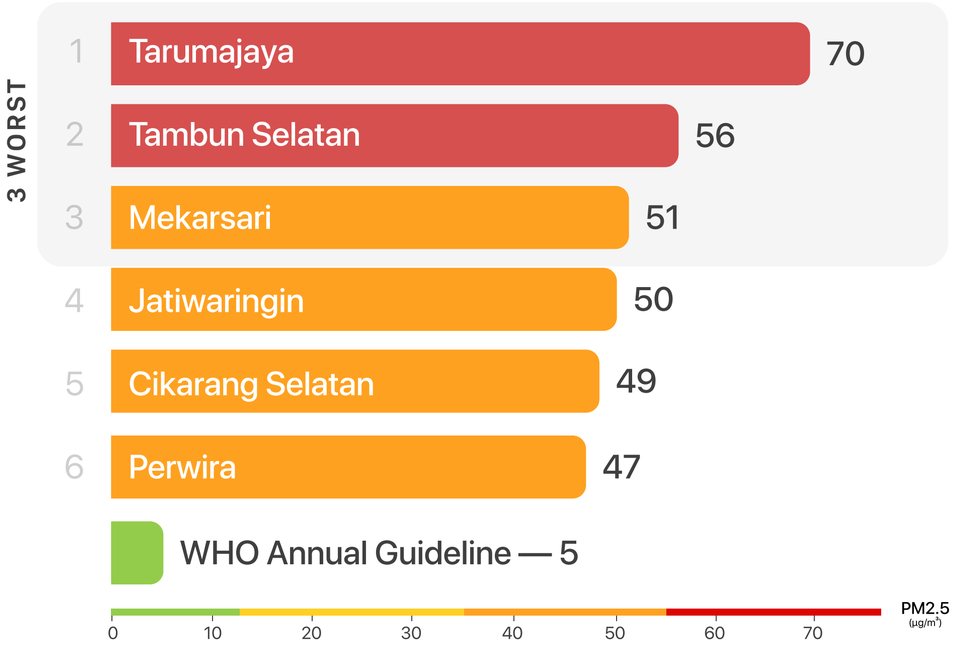
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

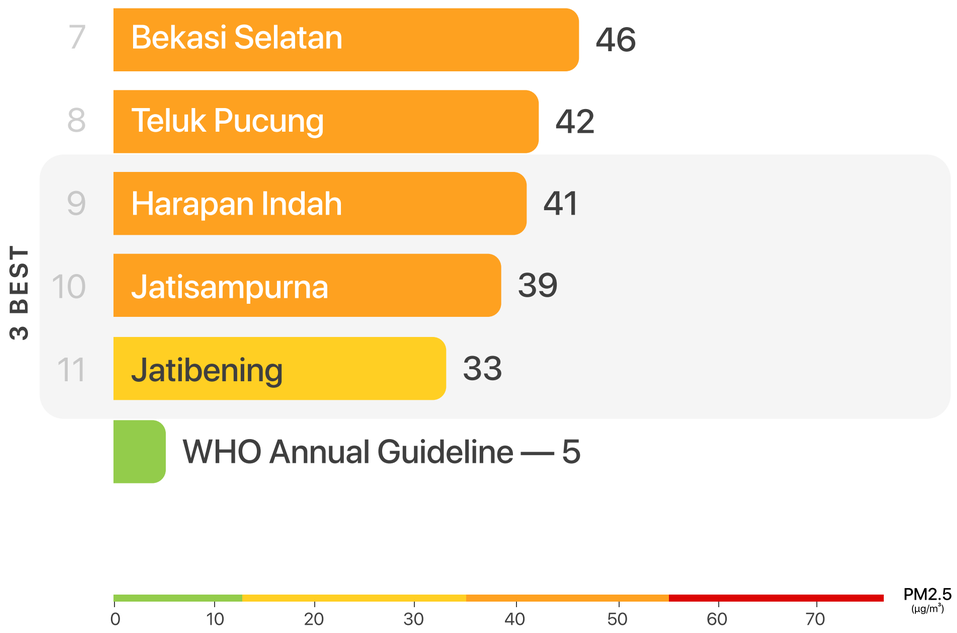
BEKASI VS DKI JAKARTA

9%

Worse than DKI Jakarta







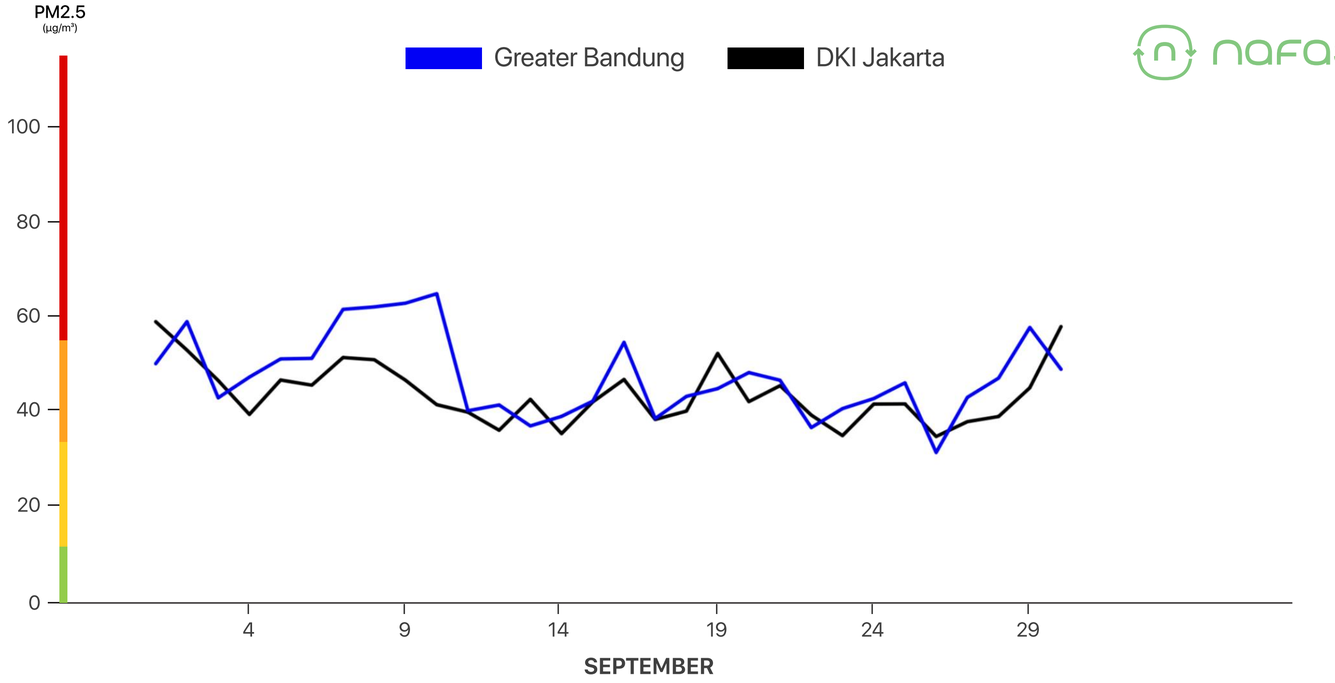
Greater Bandung

September 2023

Last September, Greater Bandung **climbed one spot from rank 6 to position 5.** Overall, its average air quality was slightly worse than that of DKI Jakarta.

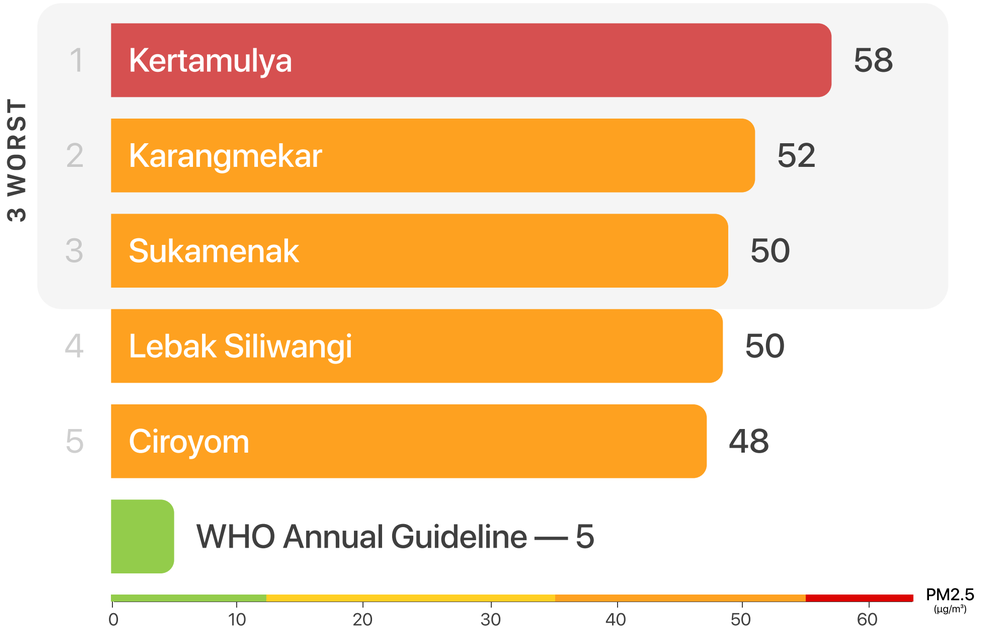
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

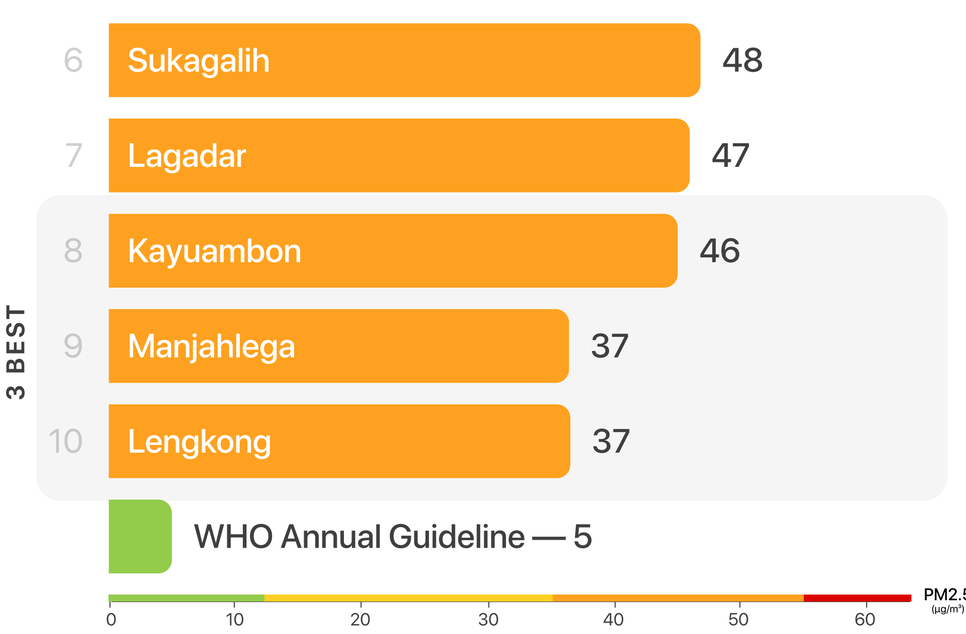
GREATER BANDUNG VS DKI JAKARTA



8%

Worse than DKI Jakarta





Depok

September 2023

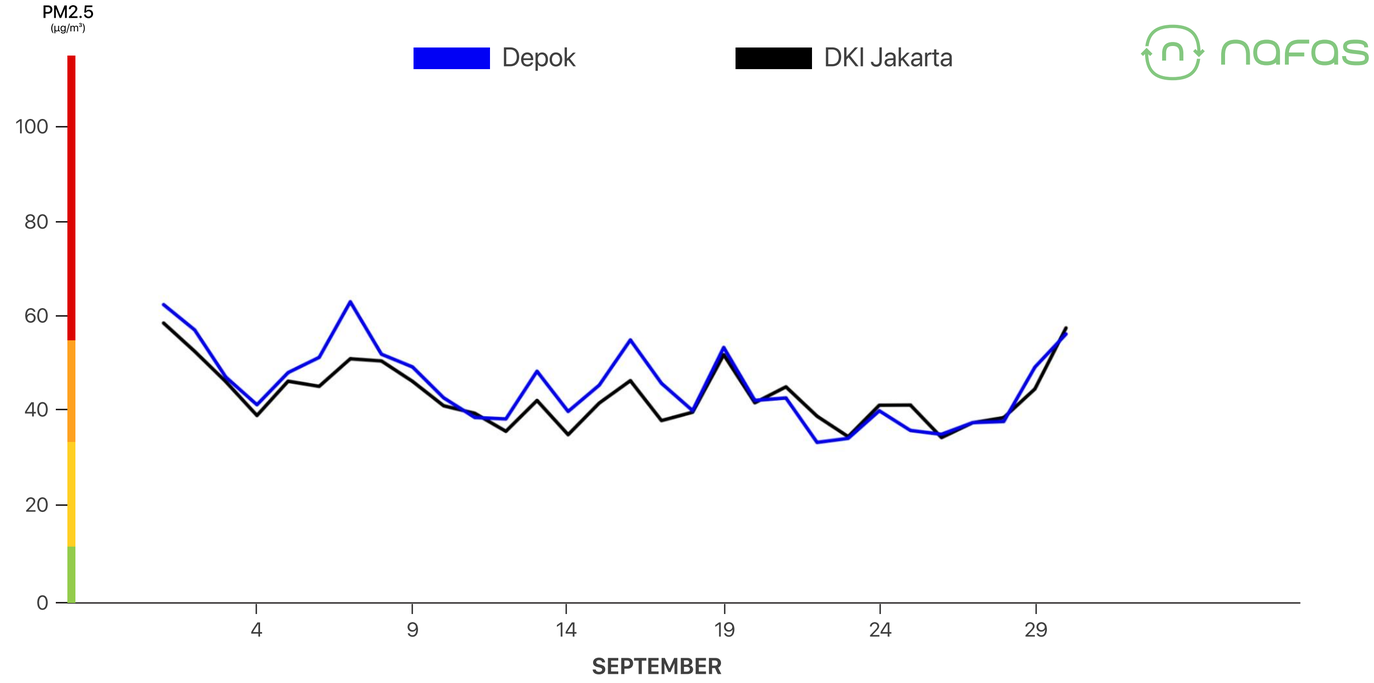
Often associated with peculiarities, the average air pollution level in Depok actually saw a slight decrease compared to August. However, the air quality throughout Depok still falls into the **"Unhealthy"** category, both for the general public and sensitive groups.

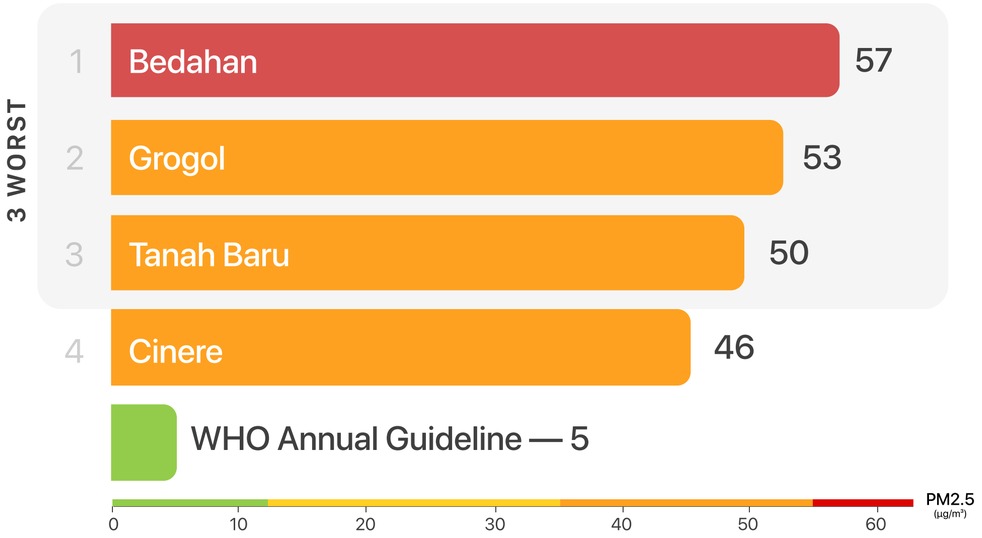
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

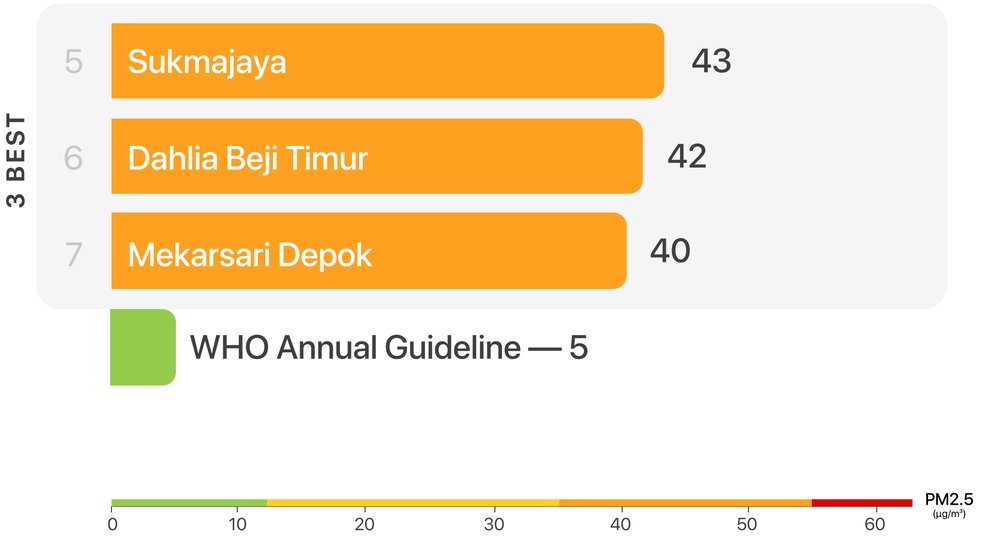
DEPOK VS DKI JAKARTA

3%

Worse than DKI Jakarta







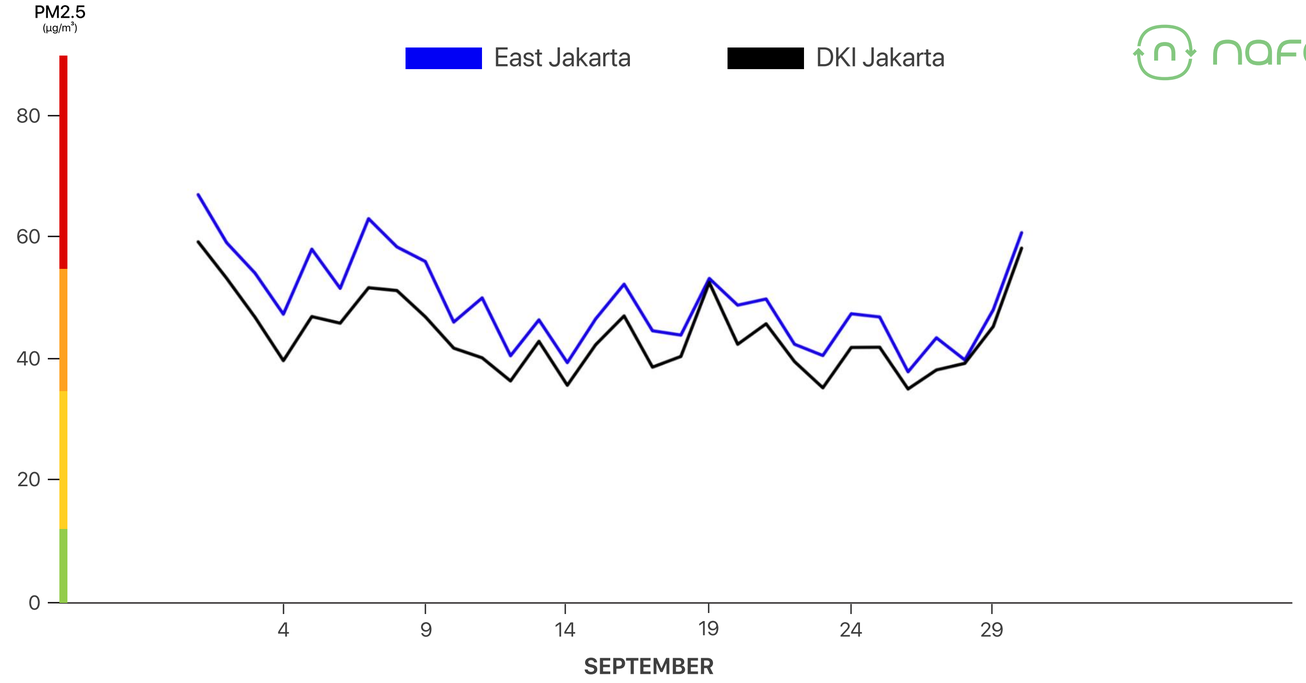
East Jakarta

September 2023

East Jakarta has once again emerged as the municipality with the highest pollution level in DKI Jakarta. **Cibubur and Cipayung remain the two most polluted locations**, with average monthly air quality reaching 15 times above the WHO's annual exposure limits.

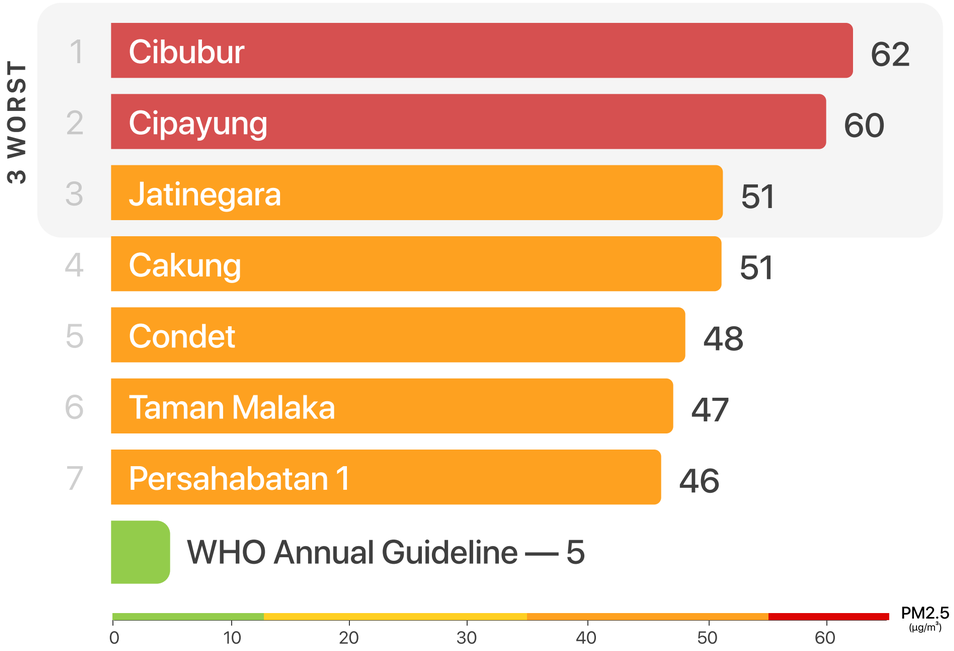
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

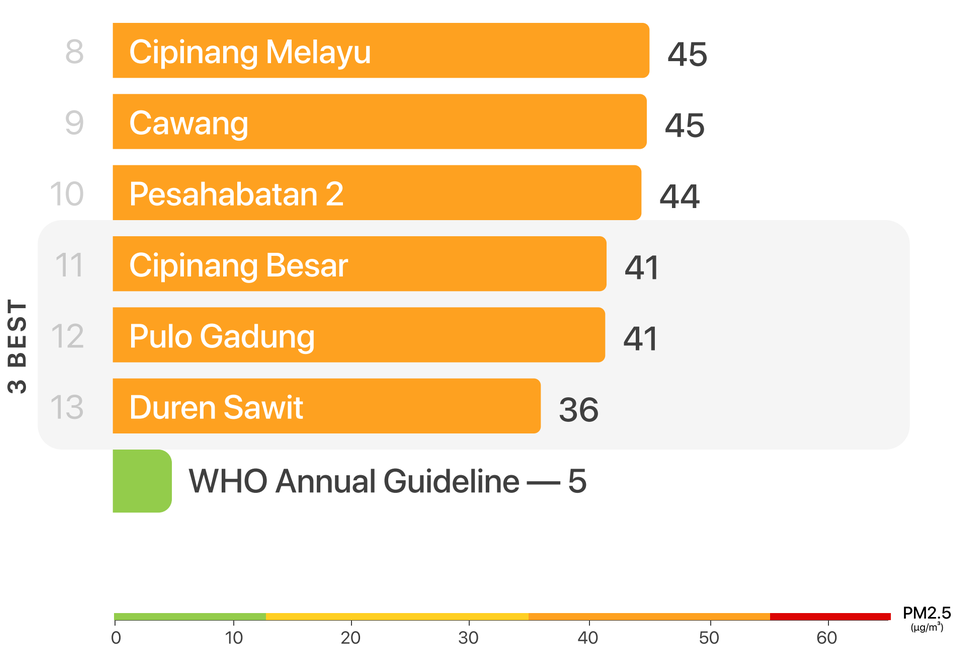
EAST JAKARTA VS DKI JAKARTA



11%

Worse than DKI Jakarta





West Jakarta

September 2023

Overall, the air quality in West Jakarta was 6% worse than the DKI Jakarta average.

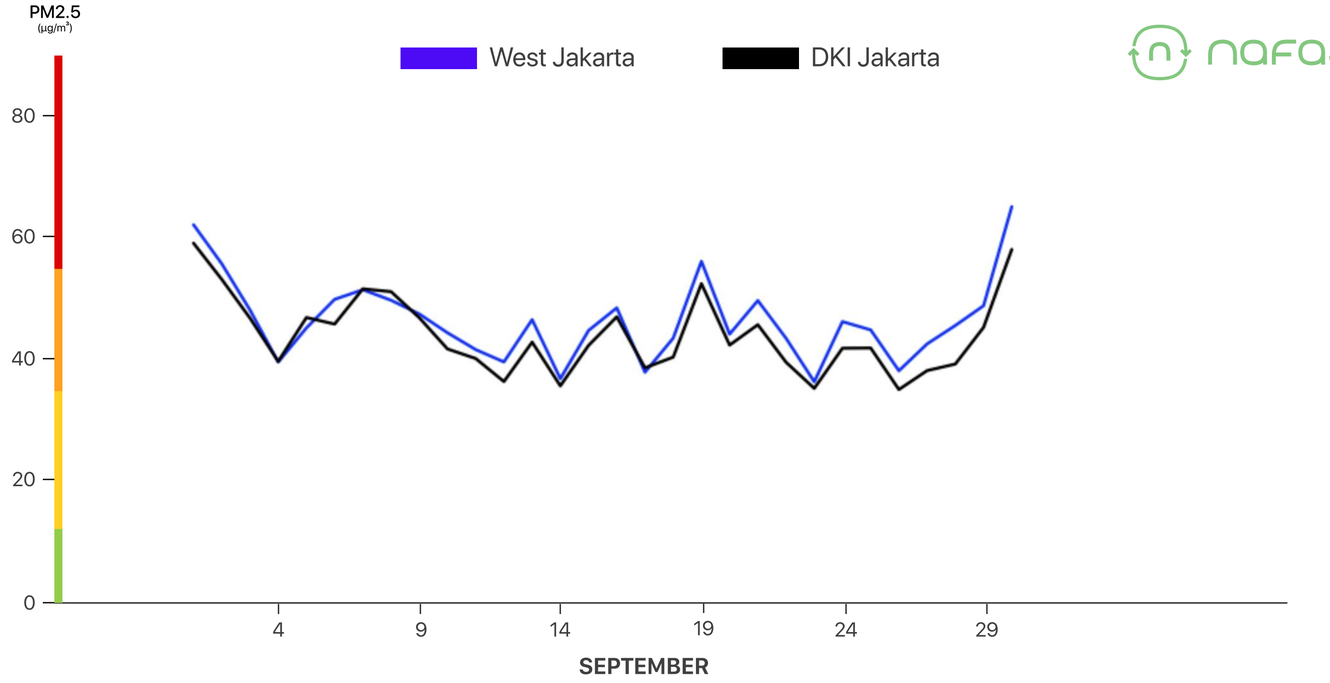
Special attention should be given to the residents of South Kembangan and Pegadungan, which were the two areas with the highest pollution levels in West Jakarta during September.

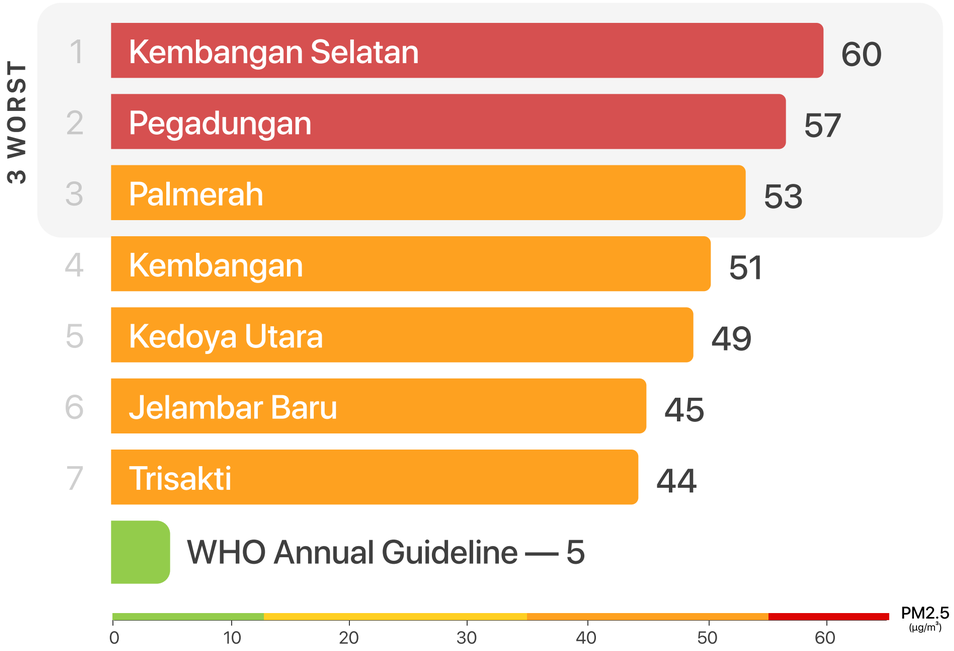
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

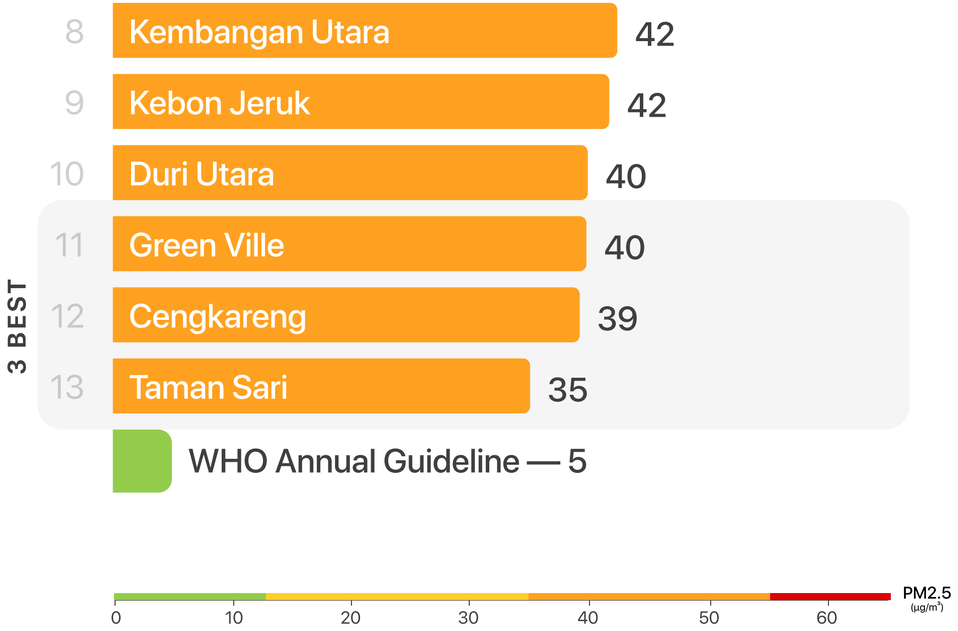
WEST JAKARTA VS DKI JAKARTA

6%

Worse than DKI Jakarta







South Jakarta

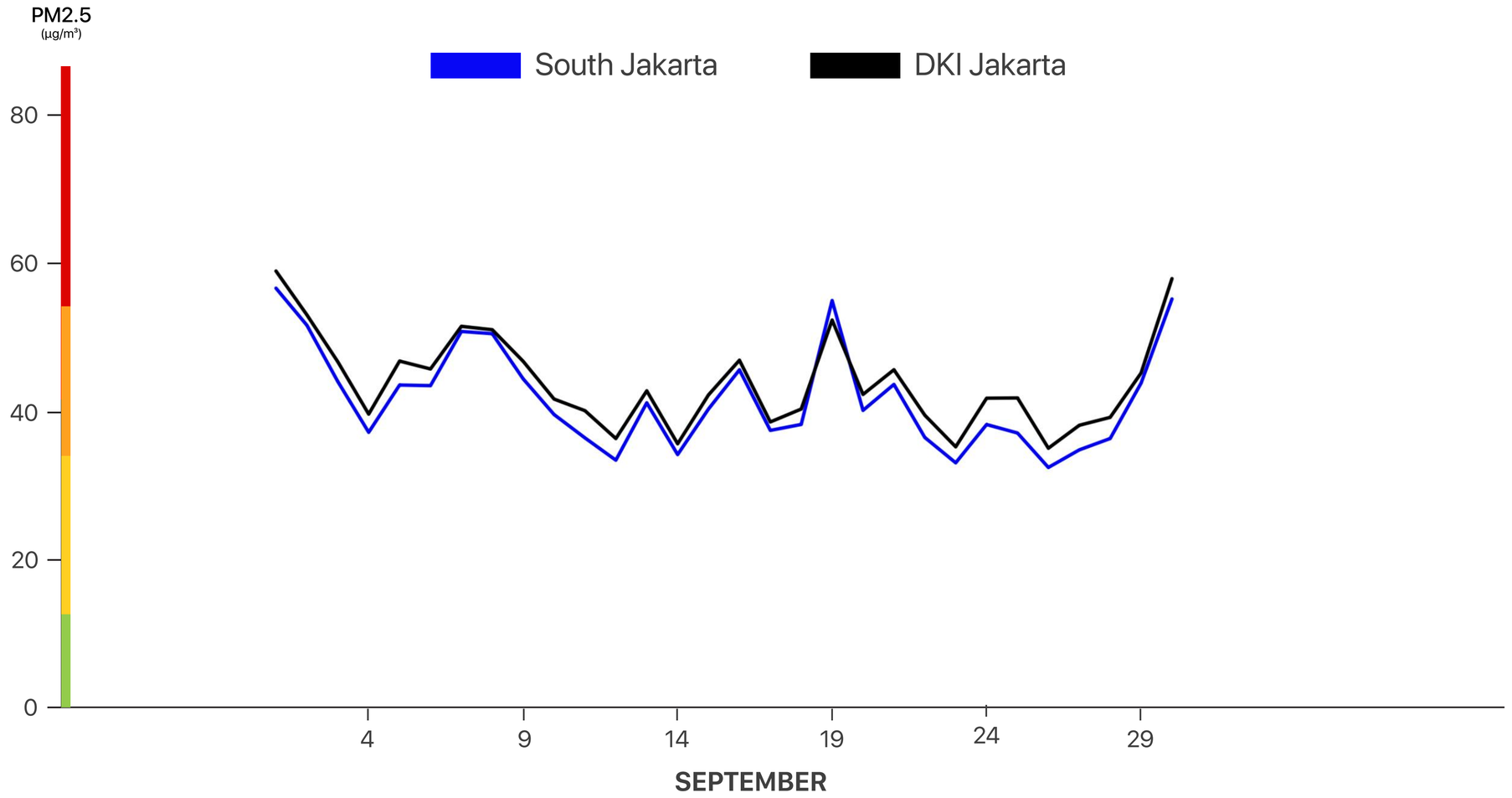
September 2023

Out of the 37 areas in South Jakarta, only **West Cilandak, Kebayoran Baru,** and **Rawa Barat** have air quality that falls into the **"Moderate"** (Fairly Good) category. Meanwhile, residents living in the remaining areas should be cautious, as the average air quality is categorized as **“Unhealthy”** for both the general public and sensitive groups.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

SOUTH JAKARTA VS DKI JAKARTA

5% Better than DKI Jakarta



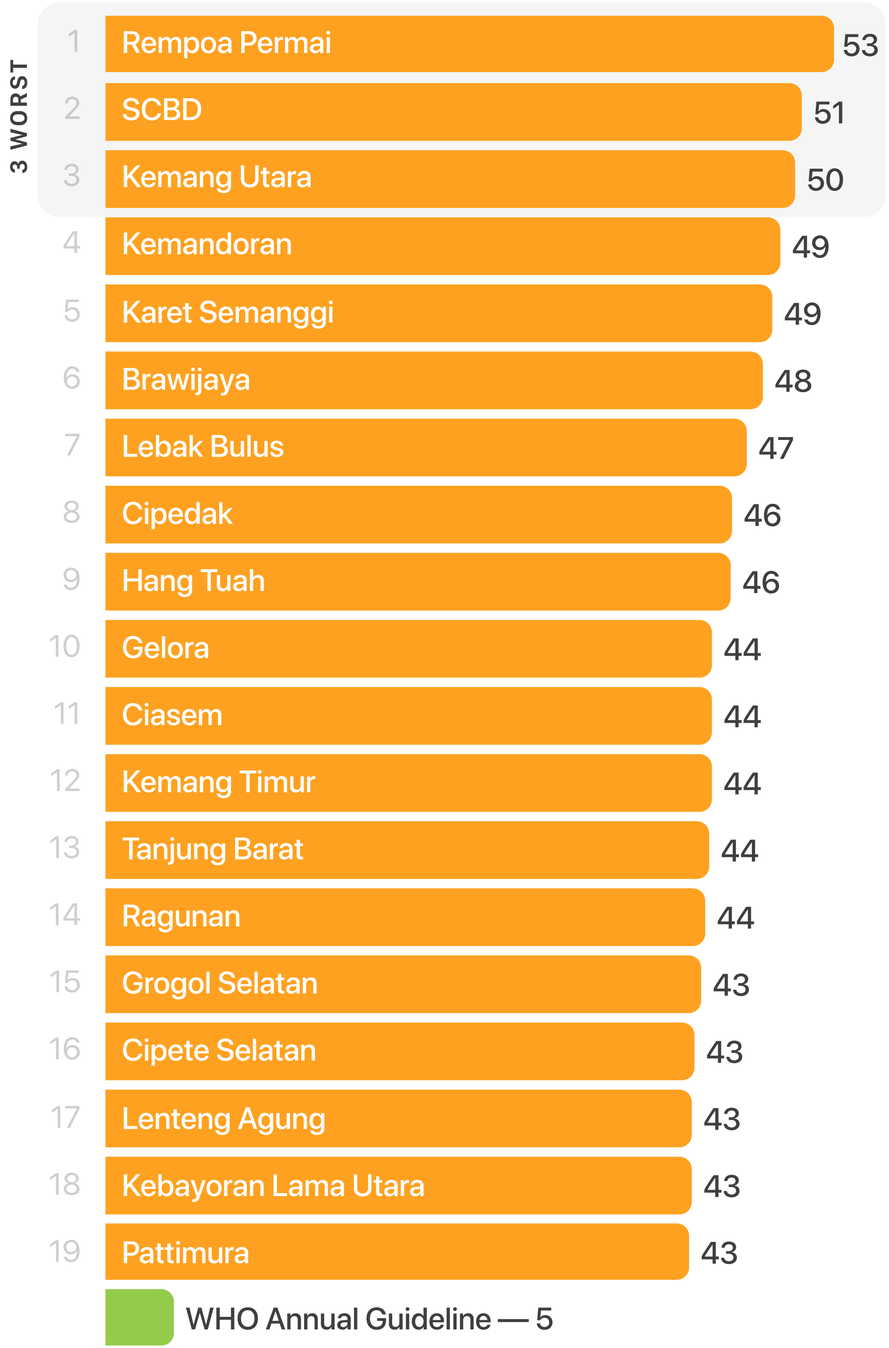
South Jakarta

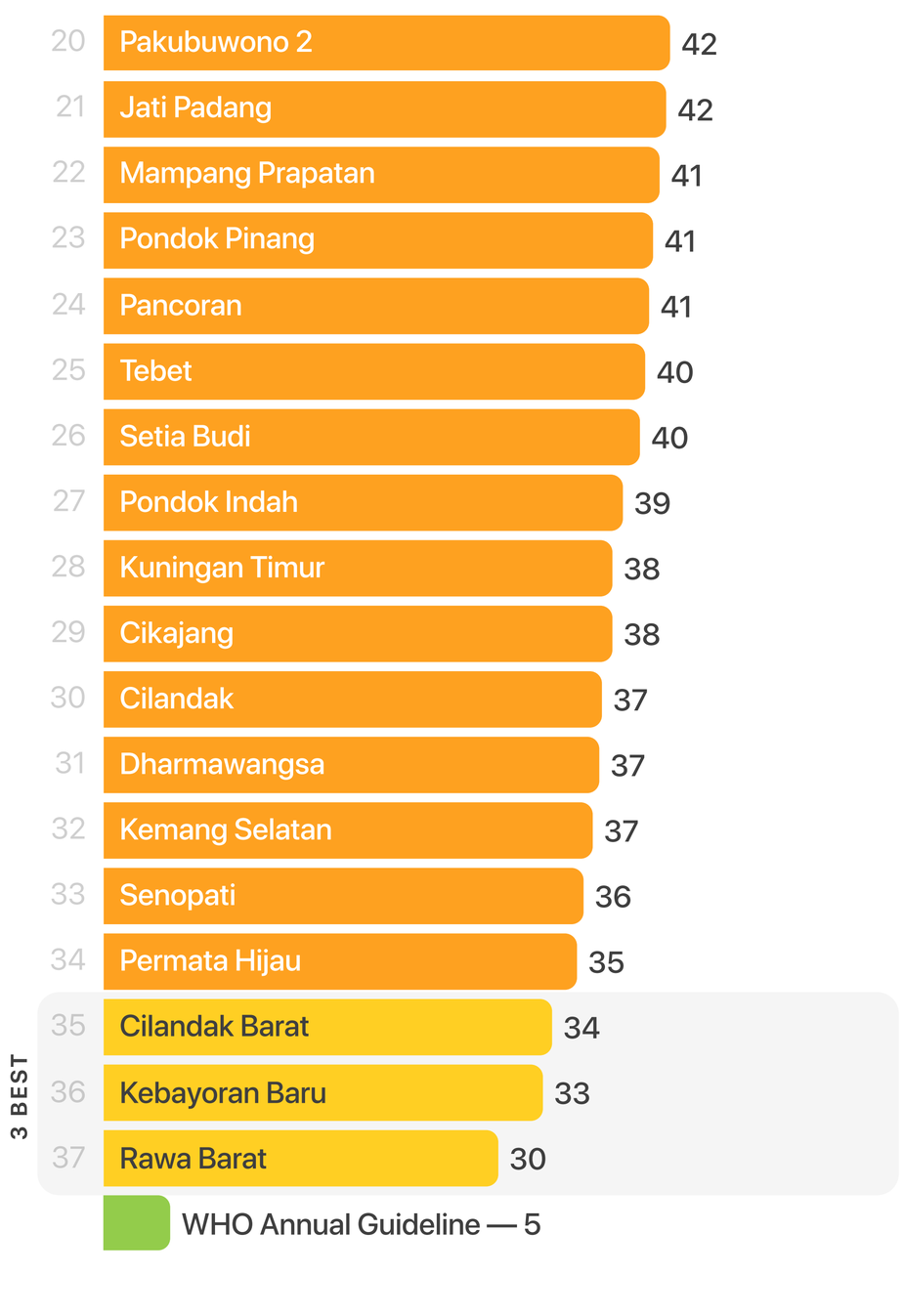
September 2023

Out of the 37 areas in South Jakarta, only **West Cilandak, Kebayoran Baru,** and **Rawa Barat** have air quality that falls into the **"Moderate"** (Fairly Good) category. Meanwhile, residents living in the remaining areas should be cautious, as the average air quality is categorized as **"Unhealthy"** for both the general public and sensitive groups.

nafas

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy





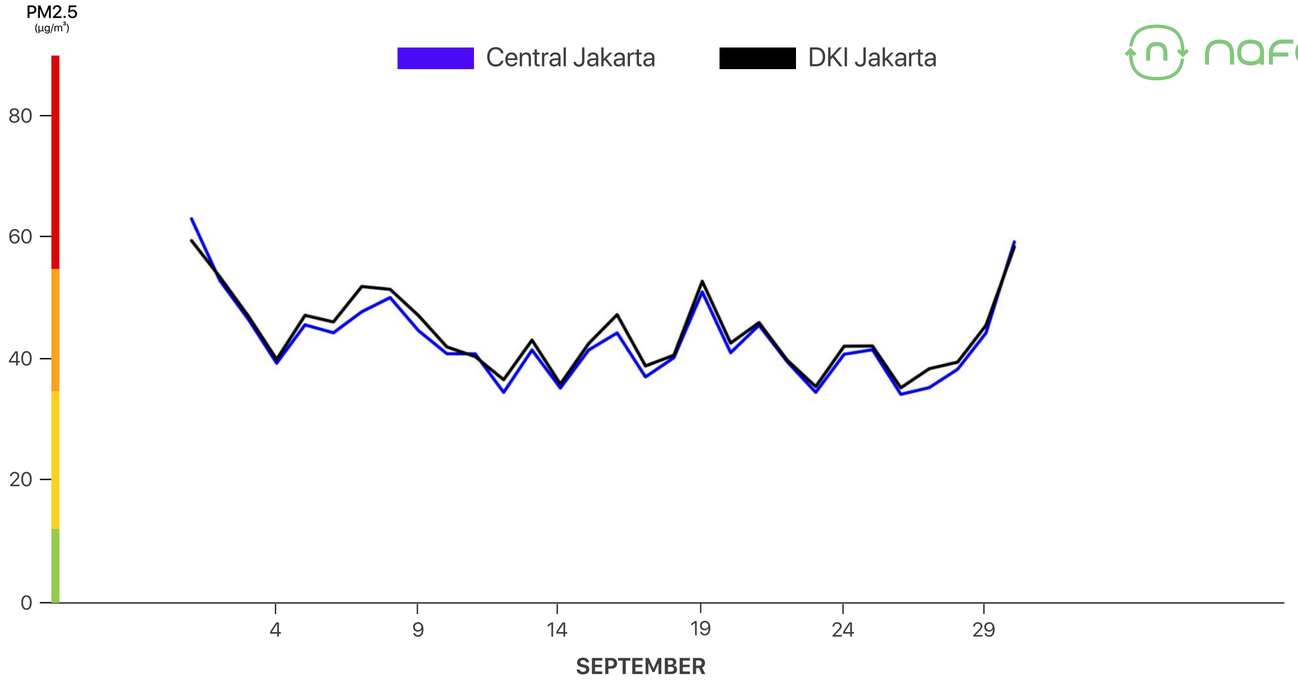
Central Jakarta

September 2023

Overall, the air quality in Central Jakarta is slightly better than the average for DKI Jakarta. However, data from the Nafas sensors installed in the five areas of Central Jakarta indicate an average air quality that is "Unhealthy for Sensitive Groups."

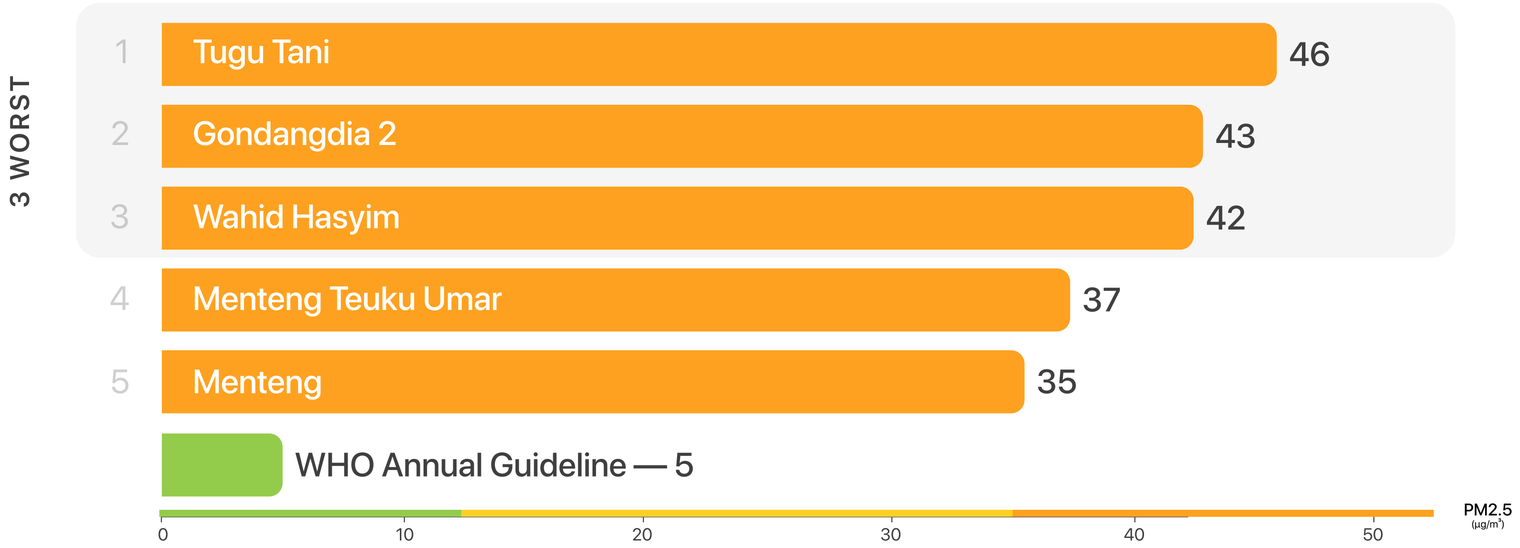
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

CENTRAL JAKARTA VS DKI JAKARTA



3%

Better than DKI Jakarta



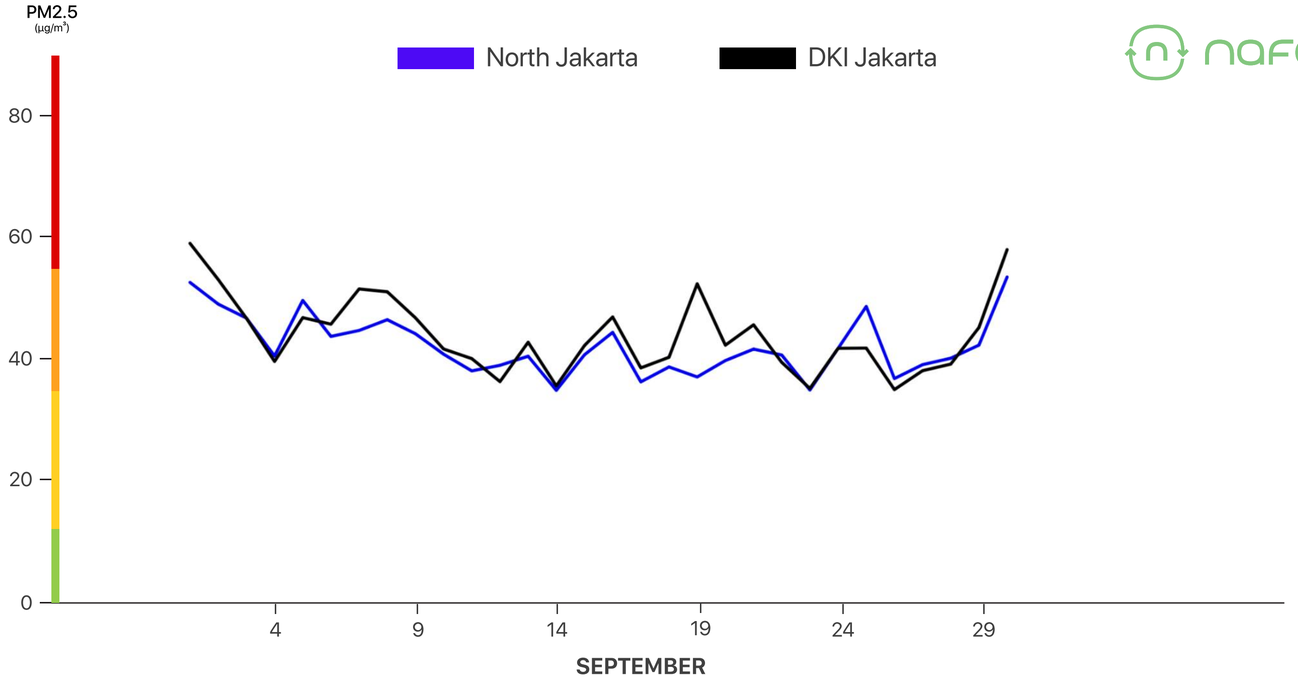
North Jakarta

September 2023

Being closest to the sea doesn't necessarily guarantee North Jakarta's air is clean and free from pollution. Although, on average, its air quality is slightly better than the DKI Jakarta average.

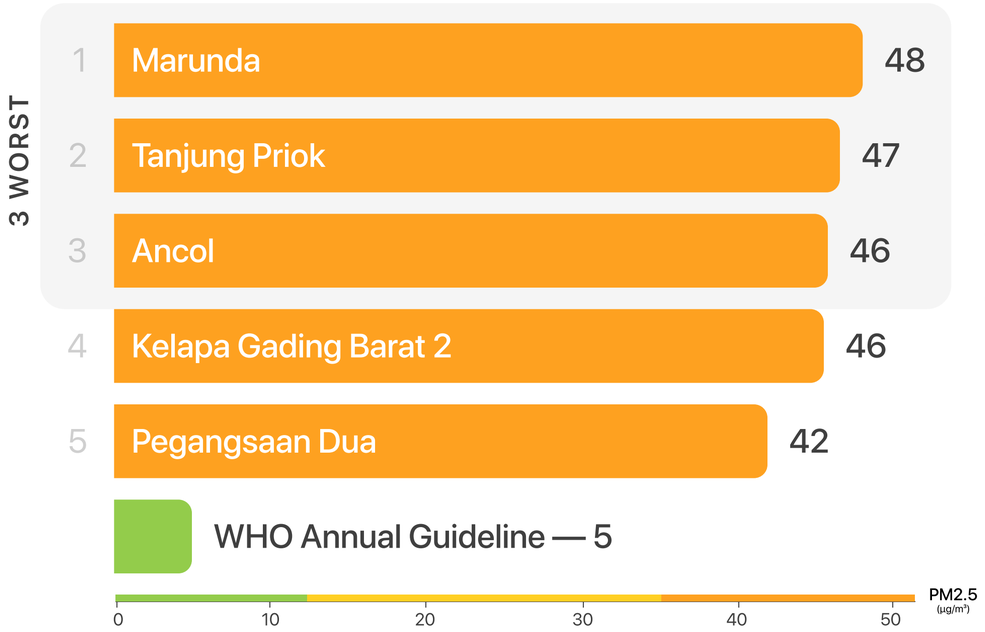
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

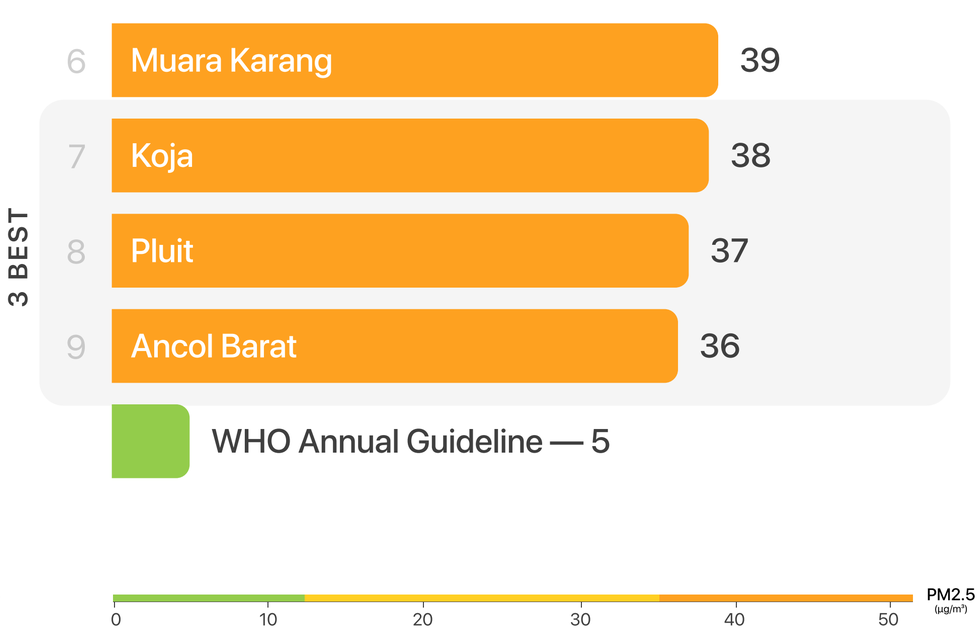
NORTH JAKARTA VS DKI JAKARTA



4%

Better than DKI Jakarta





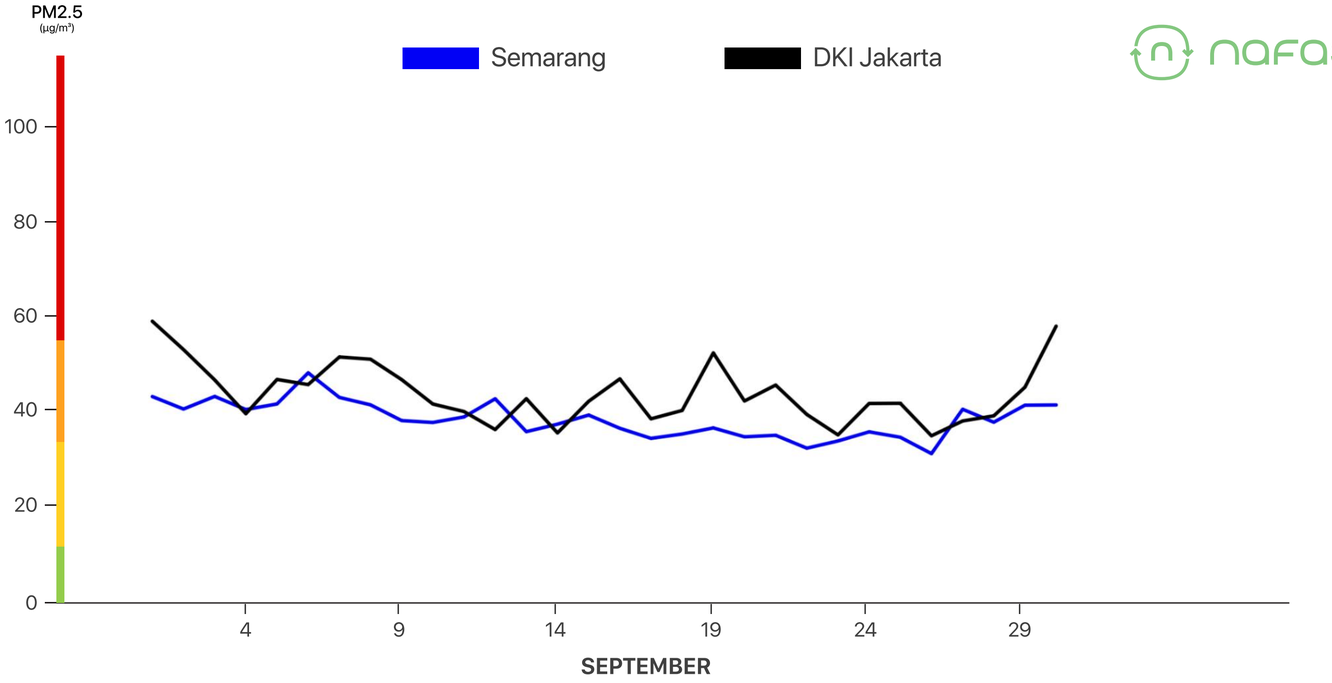
Semarang

September 2023

Air pollution levels in Semarang were observed to fluctuate throughout September. The overall air quality there was still 12% better than the DKI Jakarta average.

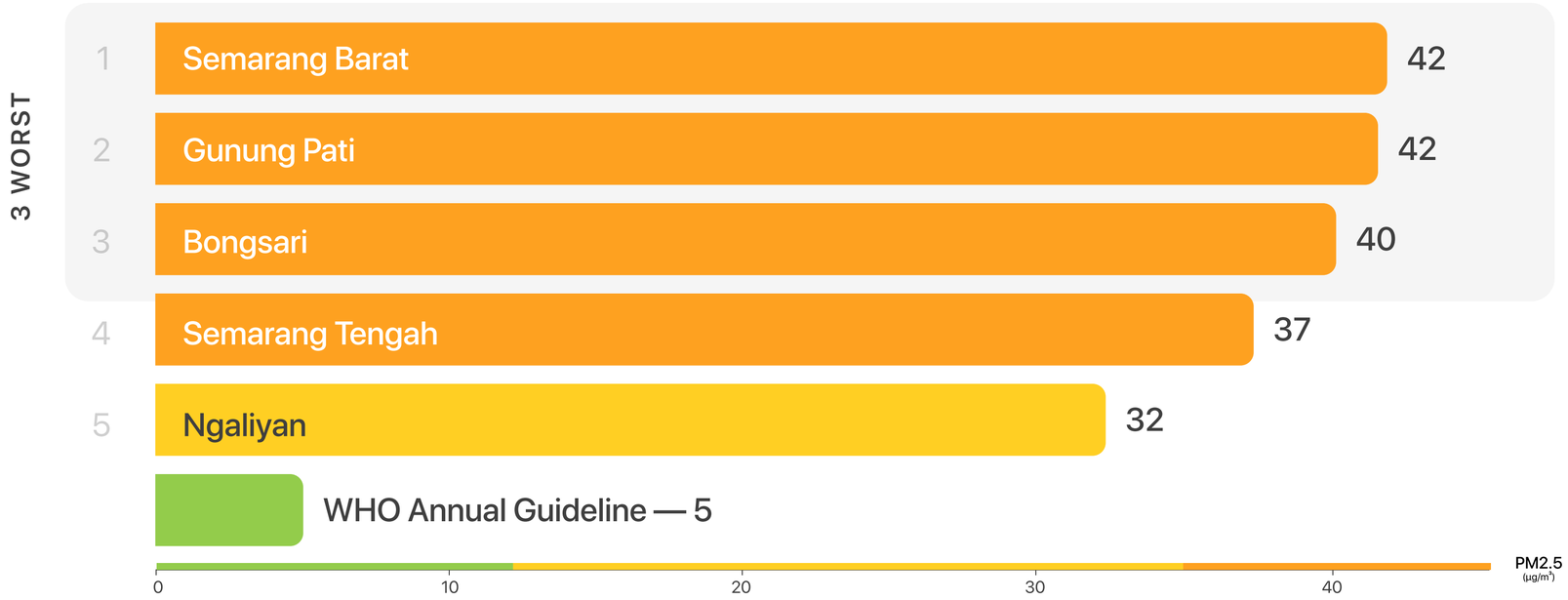
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

SEMARANG VS DKI JAKARTA



12%

Better than DKI Jakarta



Daerah Istimewa Yogyakarta

September 2023

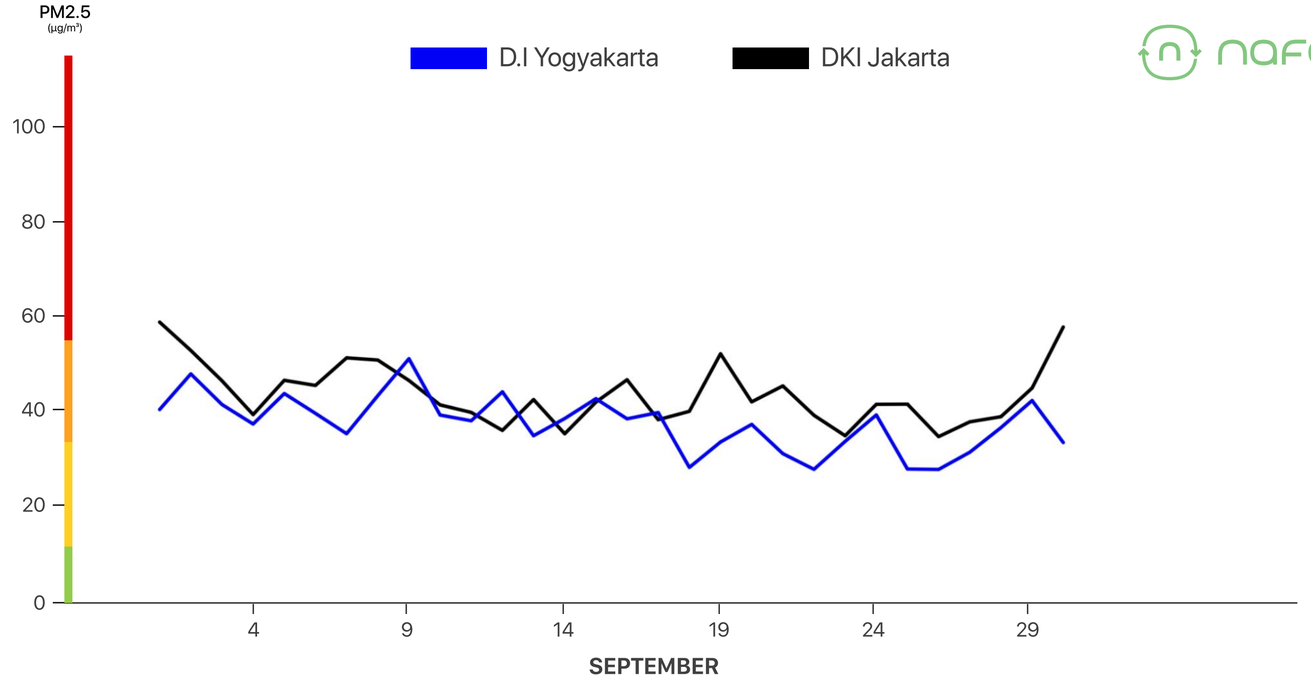
Although the average monthly air quality is much better than Jakarta's, there are still areas in D.I. Yogyakarta where the air quality for September falls into the **"Unhealthy for Sensitive Groups"** category, such as **Sayidan, Sorowajan,** and **Gondolayu.**

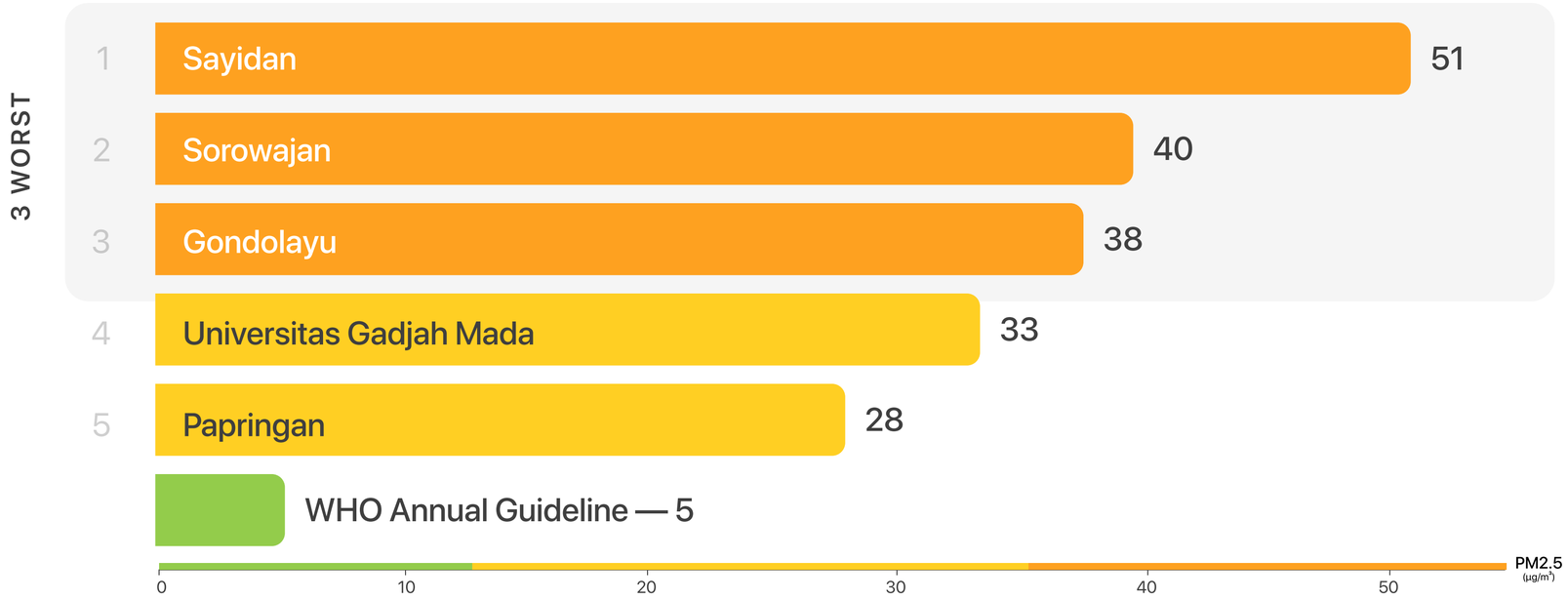
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

D.I YOGYAKARTA VS DKI JAKARTA

14%

Better than DKI Jakarta





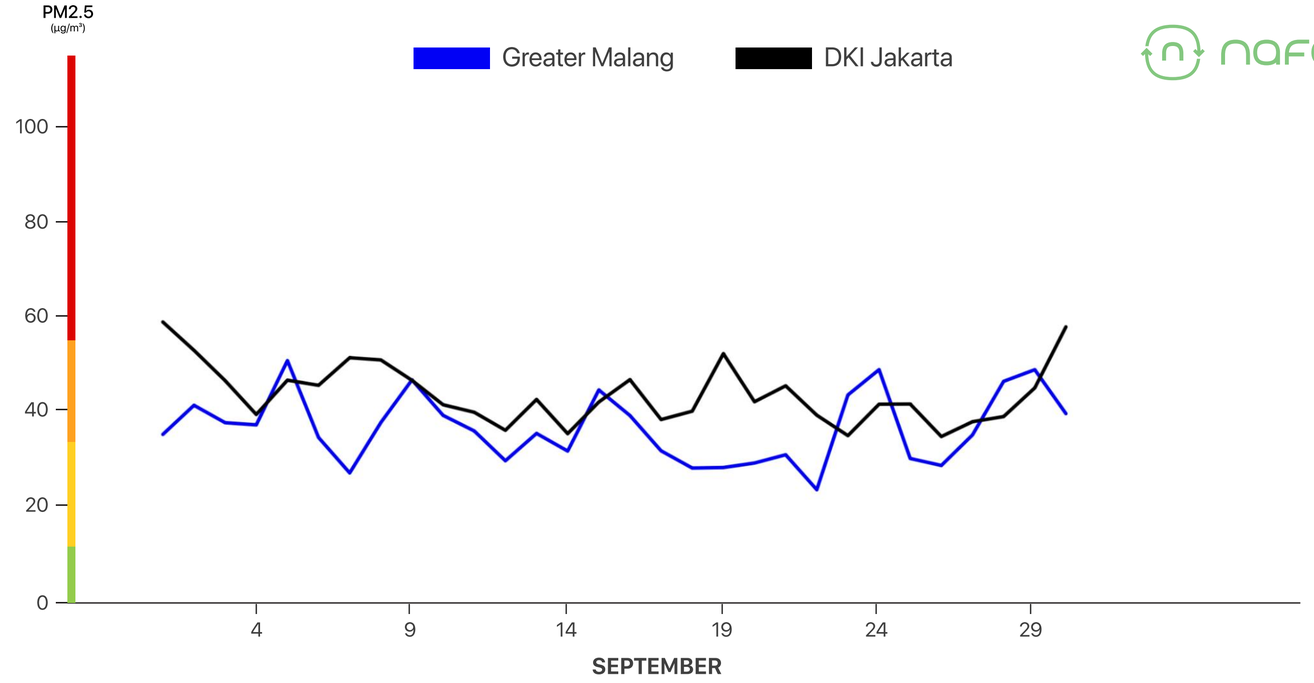
Greater Malang

September 2023

The pollution levels in Greater Malang in September experienced a slight decline. However, pollution spikes still occurred daily. The monthly average for **Bandulan** and **Polowijan** is fairly good, unlike other areas which fall into the **"Unhealthy for Sensitive Groups"** category.

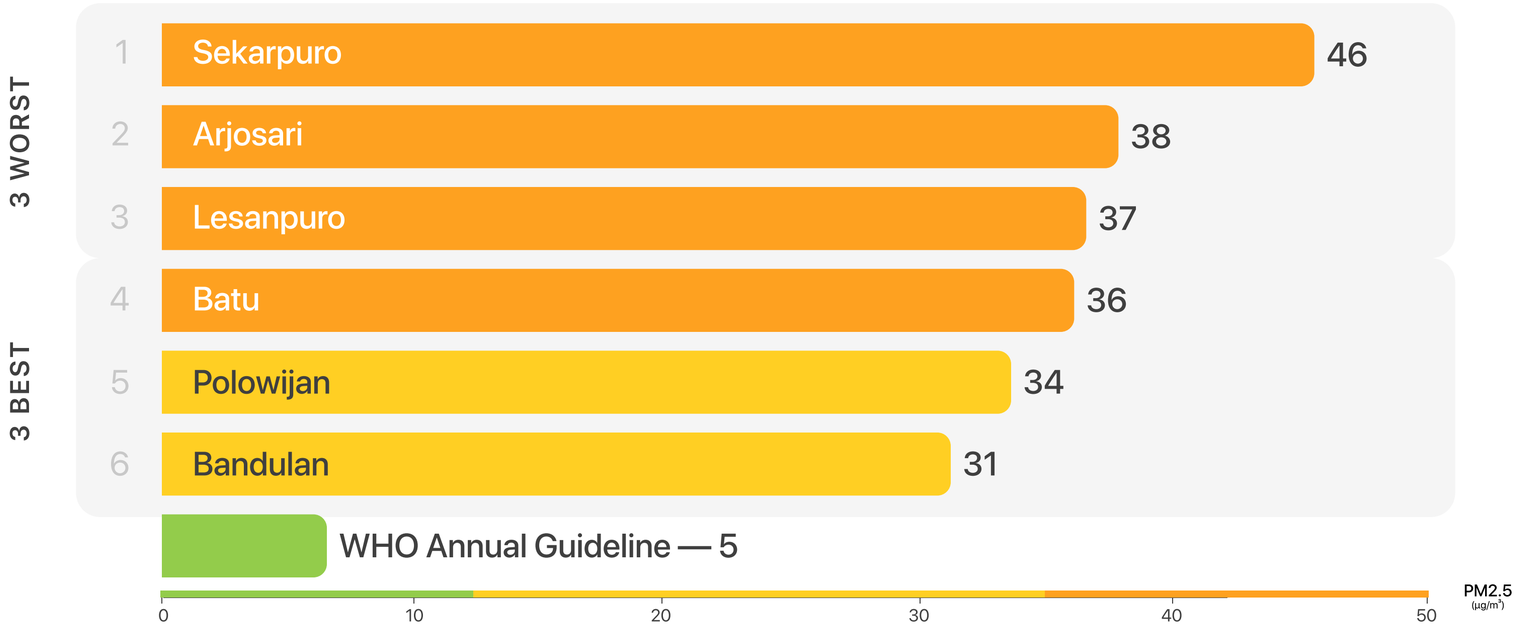
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

GREATER MALANG VS DKI JAKARTA



16%

Better than DKI Jakarta



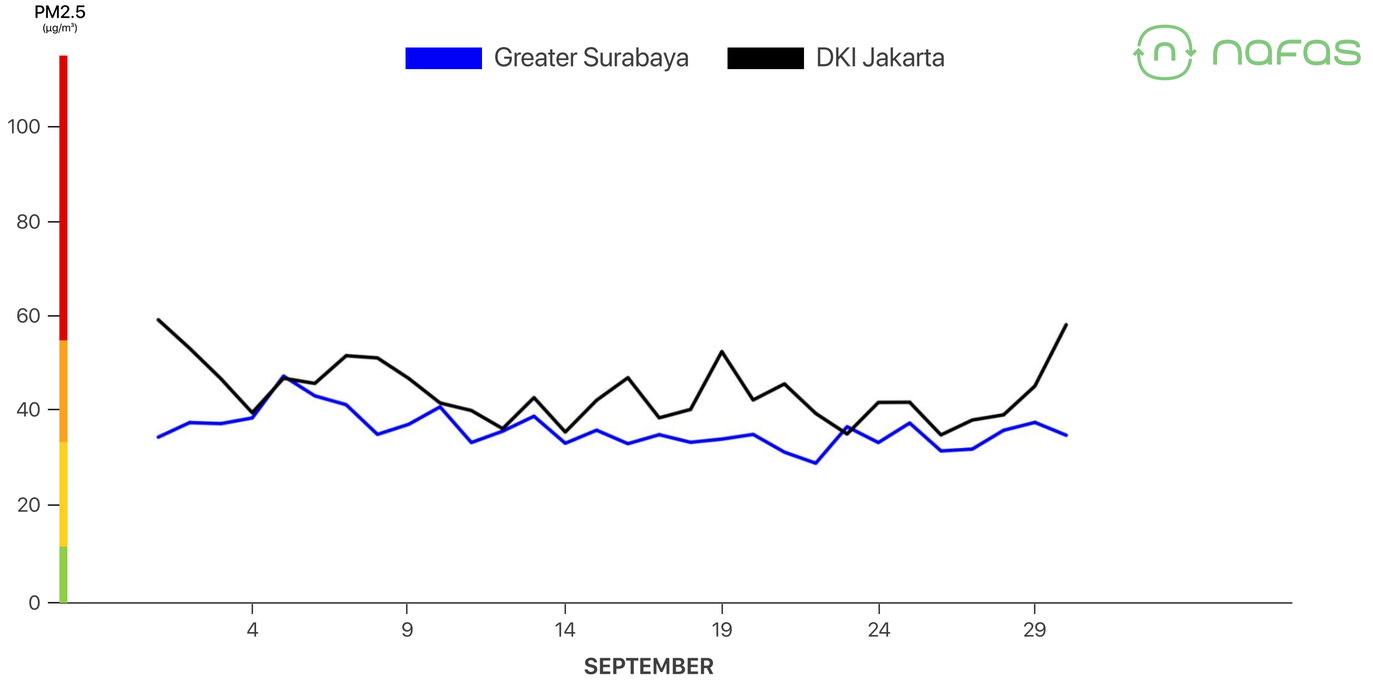
Greater Surabaya

September 2023

Dropping two places to rank 15, the Greater Surabaya area showed an average air quality slightly better than that of DKI Jakarta. However, residents of Punggul consistently experienced air that, on a monthly average, was deemed unhealthy.

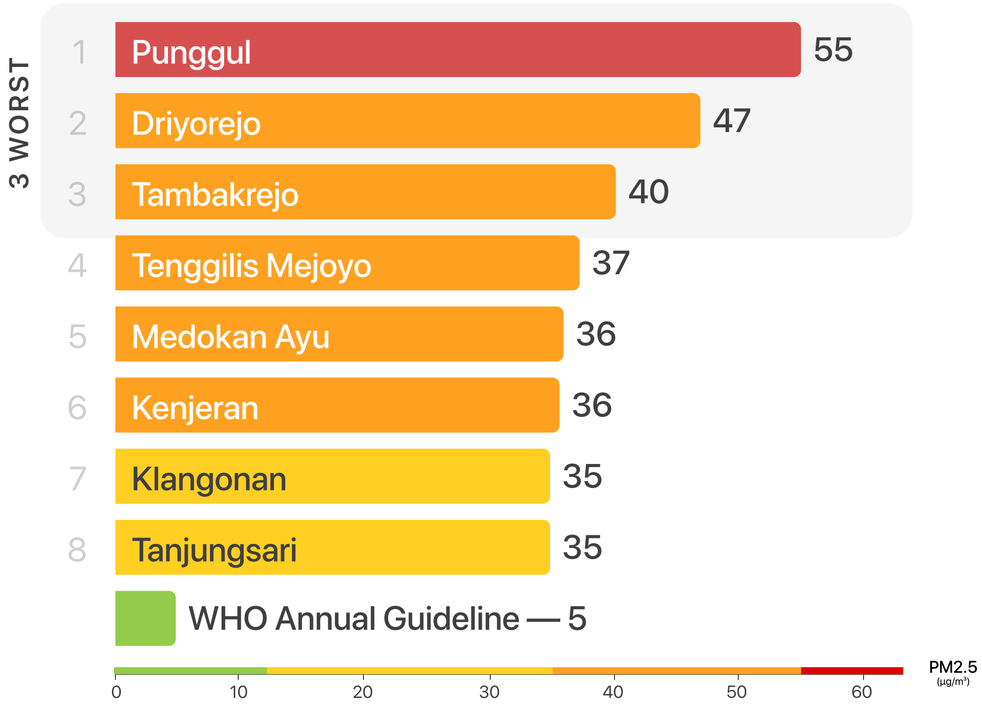
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

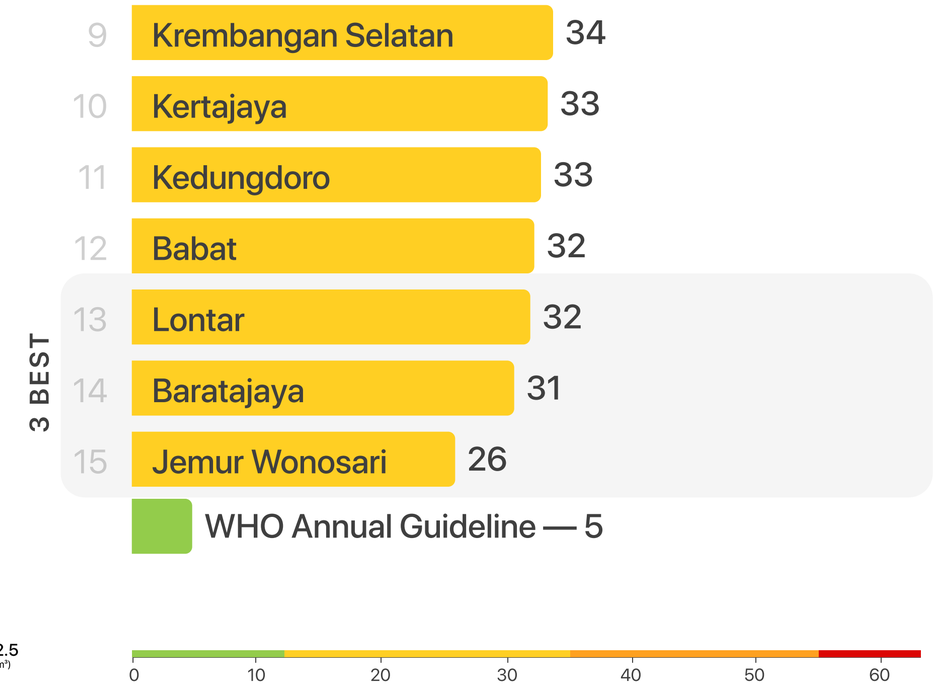
GREATER SURABAYA VS DKI JAKARTA



18%

Better than DKI Jakarta



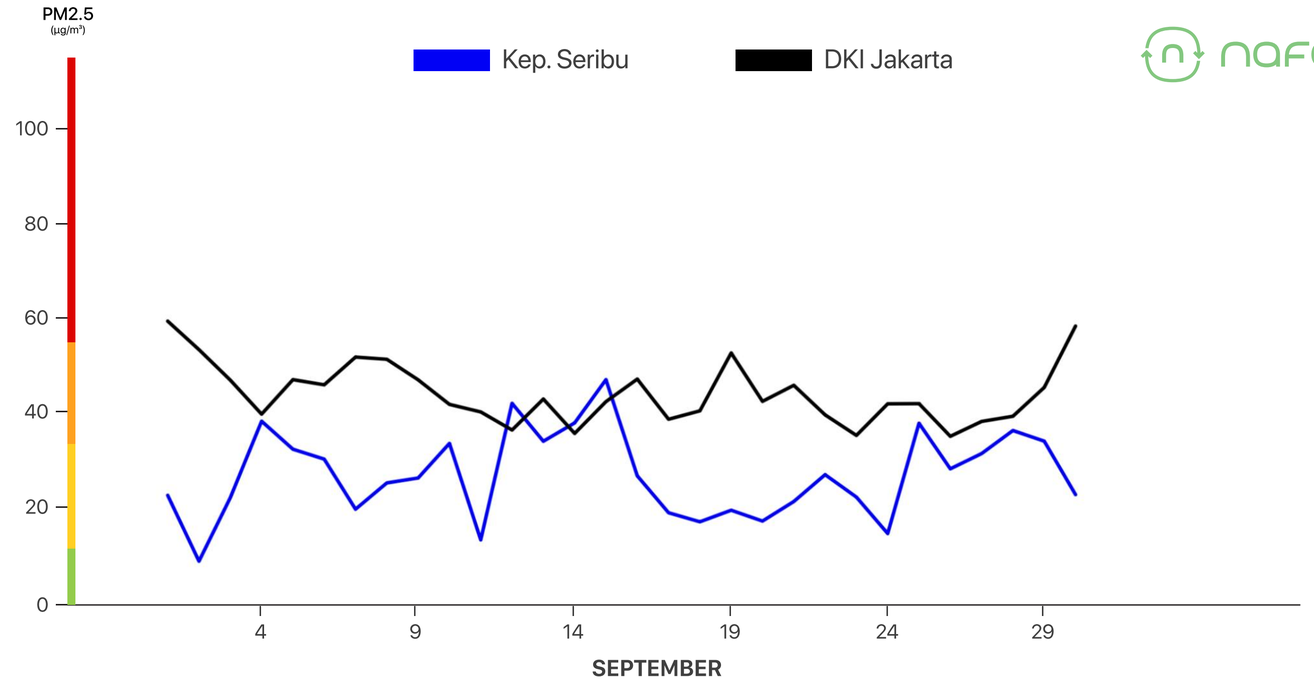


Kepulauan Seribu

September 2023

Consider adding Kepulauan Seribu to your vacation destinations. Based on the September report, the air quality in Kepulauan Seribu is 38% better than in DKI Jakarta!

KEP. SERIBU VS DKI JAKARTA



38%

Better than DKI Jakarta

1 **Desa Laguna** 27

WHO Annual Guideline — 5

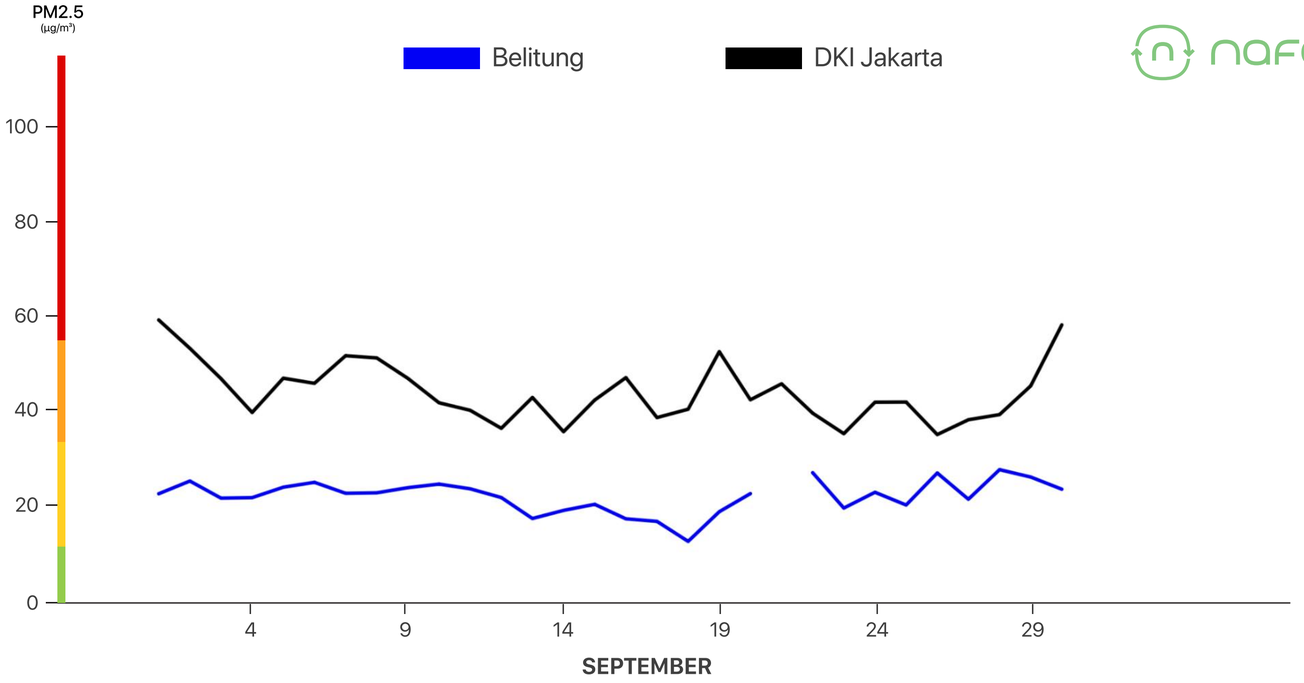
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

Belitung
September 2023

With an average monthly PM2.5 level of 22 µg/m³, Belitung successfully maintained its title as one of the regions with the best air quality in the Nafas sensor network.

- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

BELITUNG VS DKI JAKARTA



50%

Better than DKI Jakarta

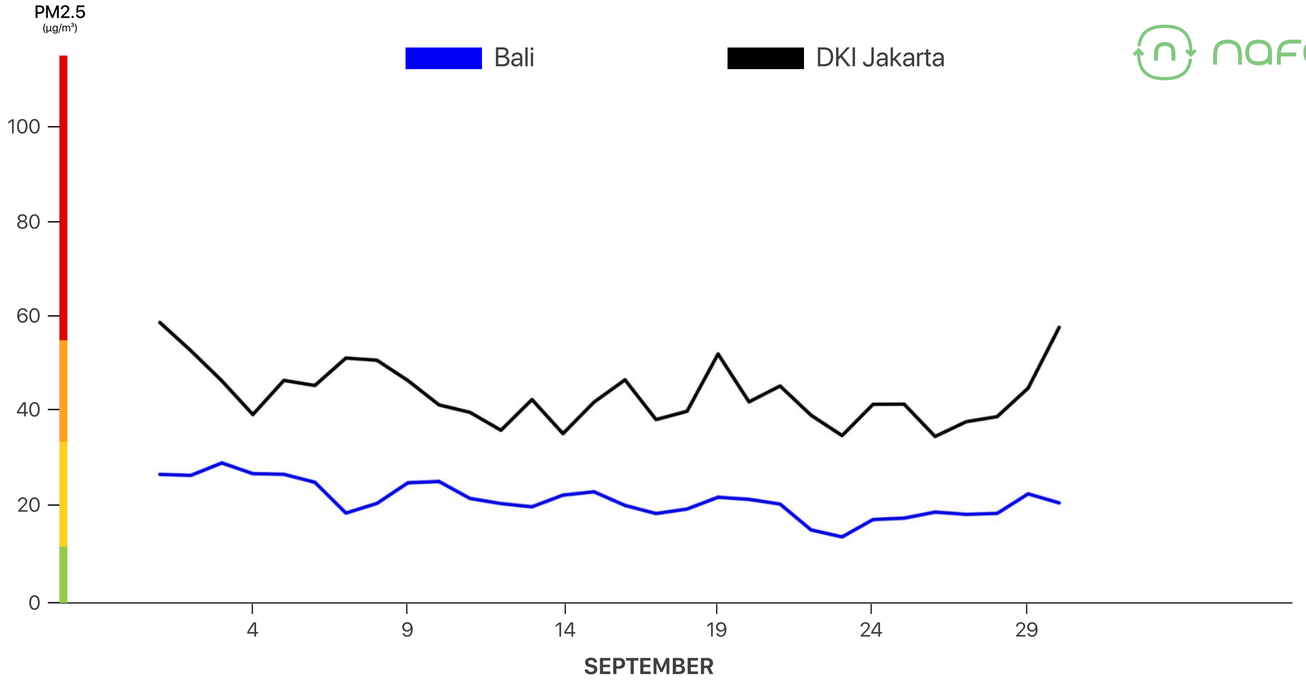
Bali

September 2023

Bali has successfully overtaken Belitung as the region with the best air quality in the Nafas sensor network. Throughout September, its PM2.5 pollution levels consistently remained below the DKI Jakarta average. Congratulations!

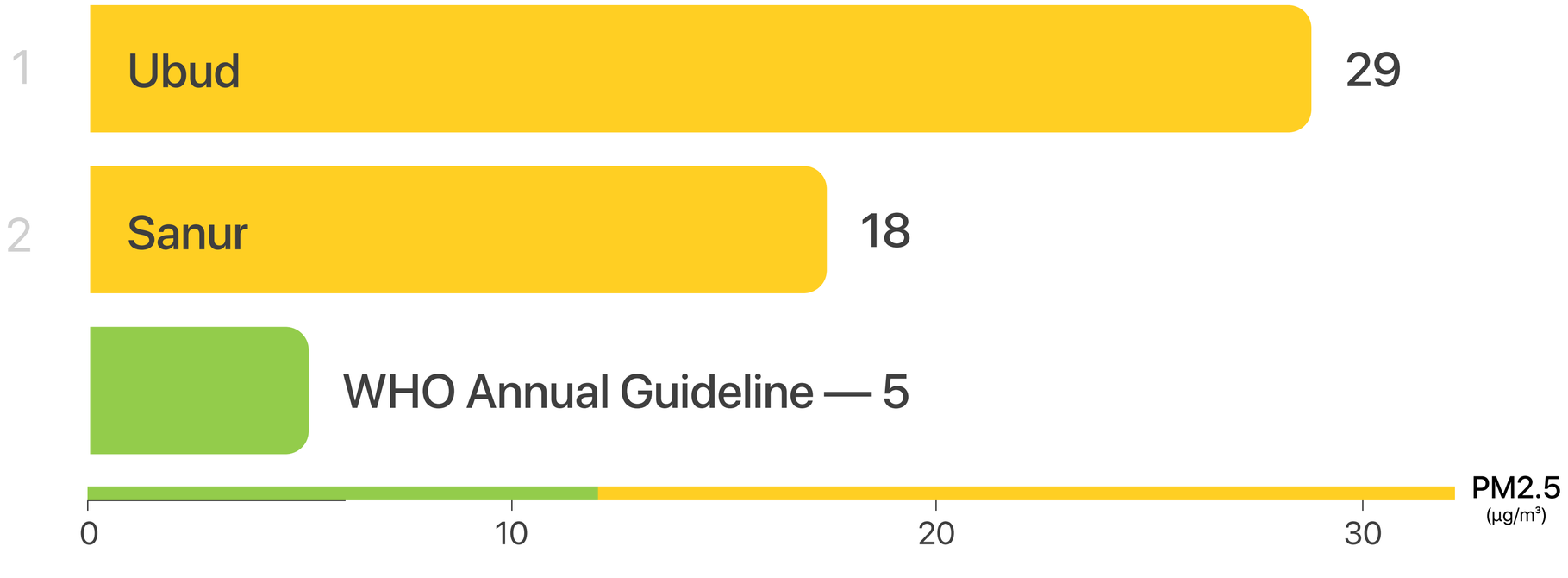
- Good
- Moderate
- Unhealthy for Sensitive Group
- Unhealthy

BALI VS DKI JAKARTA



51%

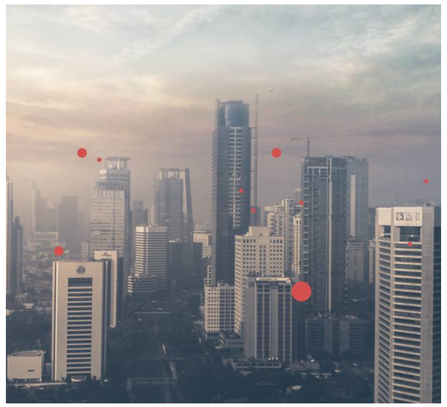
Better than DKI Jakarta



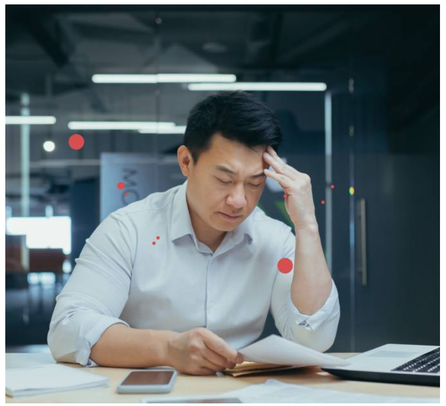
Almost all outdoor air pollution can penetrate indoors

Given the tiny dimensions of PM2.5 particles, they can easily seep through doors and windows in homes, schools, and campuses. In office buildings, pollutants might infiltrate through malfunctioning central air conditioning systems, causing us to breathe air that's nearly as polluted as the outside atmosphere.

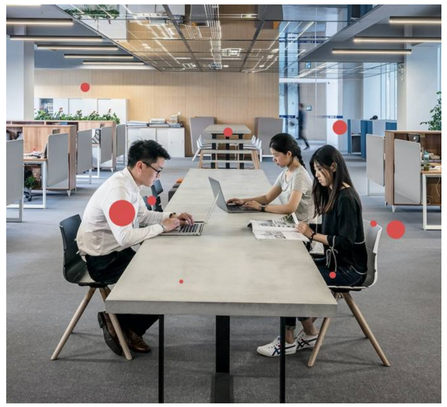
Browse the articles below for a deeper understanding of indoor air quality and its implications for our health.



OurBuildings are Broken



How Indoor Air Pollution Impacts Us in Offices



How Much Pollution Gets Inside Our Offices

Clean Air at the Office: Just a Benefit or Should It be a Standard

How Indoor Pollution Impacts Our Children in Schools

Implementing Clean Air Zones: A Proven Solution for Enhancing Office Air Quality

CAZ Stories is a series of articles that spotlight the significant impact of Clean Air Zones on diagnosing and improving indoor air quality issues for businesses in Indonesia.

Browse the articles below to read some of the inspiring CAZ Stories.

CAZ Stories: Nafas Improved Indoor Air Quality by 89% at Mighty Minds Preschool

CAZ Stories: How Nafas Reduced Indoor Pollution by 70% at AC Ventures Office

CAZ Stories: A Threefold Improvement in Indoor Air Quality at Pace Performance

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