ABOUT THIS ISSUE

This issue is an excerpt of the latest analysis by the Centre for Research on Energy and Clean Air (CREA), a research group based in Helsinki. CREA published it on October 29, 2026. The authors are Katherine Hasan, Hubert Thieriot, Candini Candanila and Lauri Myllyvirta.

CREA estimates deaths that follow within two or three days of breathing polluted air. It splits fine particles (PM2.5) into fire smoke and other pollution and gives each its own risk factor. The charts here redraw CREA figures. The text is our summary.

A NOTE FROM LANDSCAPE

CREA counts acute deaths only. It puts the chronic toll of repeated smoke seasons at 33,000 to 44,000 deaths a year, citing Hein et al. 2022 and Kiely et al. 2020. Landscape's own health cost model, built in August 2026, uses long-term exposure and estimates about 15,700 deaths in Sumatera and Kalimantan for January to October. The acute and chronic estimates answer different questions, so they should not be added together. CREA lists 92 September deaths for Papua and West Papua, 83 of them from fire smoke.

3,560 deaths

FROM FIRE SMOKE, SEPTEMBER 2026

About twice the August figure. All air pollution caused 5,310 deaths that month.

The Landscape Group

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HIGHLIGHTED PUBLICATION | EXCERPT FROM CREA

Fire Smoke Took an Estimated 3,560 Lives in September

Deaths attributed to PM2.5, September 2026, 24 most affected provinces

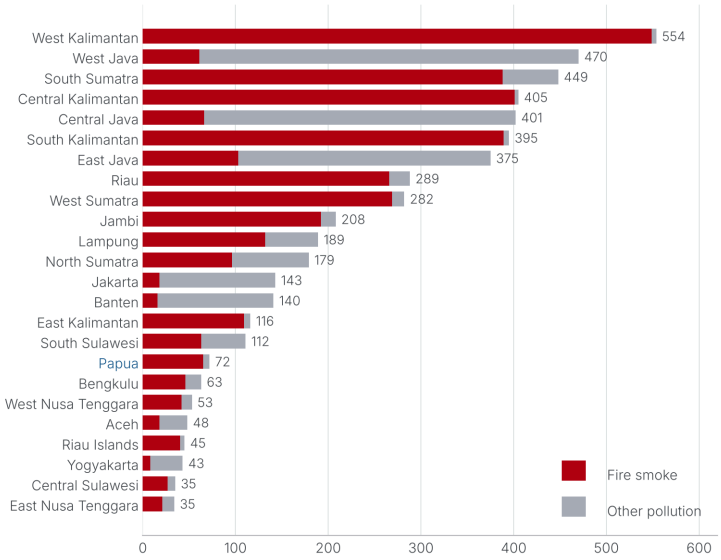


Figure 1. Deaths attributed to PM2.5 in the 24 most affected provinces, September 2026, split into fire smoke and other pollution. Redrawn from CREA Table A2, which uses the 34 provinces in place before 2022.

Main findings

CREA estimates that air pollution caused about 5,310 deaths in Indonesia in September 2026, with a 95 percent confidence interval of 4,610 to 6,080. That is 42 percent more than the 3,740 deaths it estimated for August. Fire smoke caused 3,560 of the September deaths, about twice the August figure. Pollution from power plants, industry and transport caused the other 1,750.

Location of the deaths

Kalimantan and Sumatra carry most of the fire deaths. West Kalimantan had the most, 554, almost all from smoke. Fire caused 99 percent of deaths in West, Central and South Kalimantan and 94 percent in East Kalimantan. Central Kalimantan had the highest death rate, 14.1 per 100,000 people. South Sumatra had 449 deaths, 87 percent from fire, and fire caused over 90 percent of deaths in Riau, Jambi and West Sumatra. Java's deaths held steady at about 1,530 and came mostly from other pollution.

Exposure

Smoke was heaviest in Kalimantan. Population-weighted PM2.5 there averaged 120 micrograms per cubic meter in September, up from 57 in August, and peaked at 196 on September 21. Sumatra averaged 51, up from 37. The national average was 36, more than seven times the WHO annual guideline of 5. On the worst day of September, 57.8 million people breathed air rated unhealthy to hazardous, a monthly record and 16.5 million more than the August peak. In Kalimantan 6.4 million people breathed hazardous air on the worst day.

Acute Deaths Are Only Part of the Toll

CREA puts the chronic toll of fire smoke at 33,000 to 44,000 deaths a year.

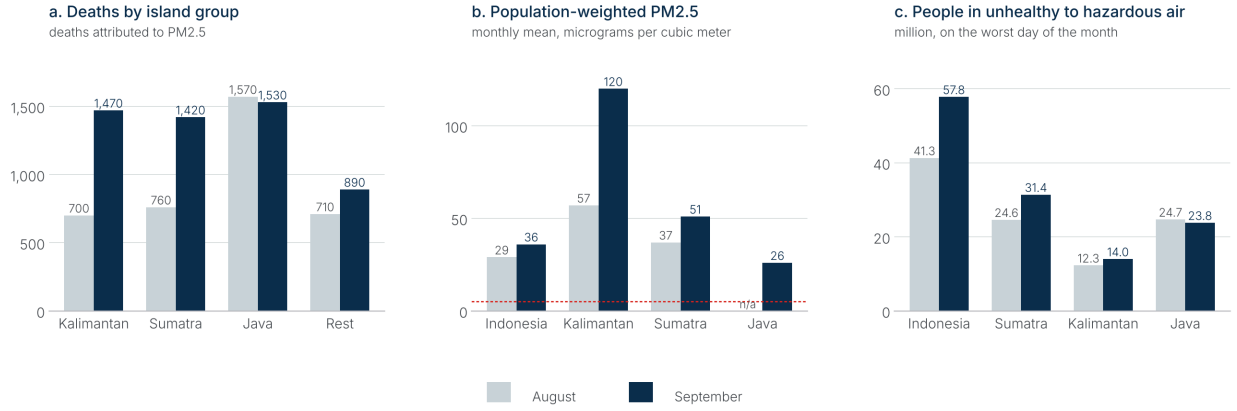


Figure 2. August and September 2026. a, deaths for Kalimantan (four provinces), Sumatra (five), Java (five) and the rest. b, PM2.5 with the WHO annual guideline of 5 dashed; no August value for Java. c, people in unhealthy to hazardous air on the worst day. Redrawn from CREA.

Respiratory illness

The Ministry of Health recorded 333,470 acute respiratory infection cases in seven affected provinces as of October 21. The count was 50,891 for July and August and 283,270 by October 13. Children under five made up about a quarter of them.

Comparison with 2015

CREA sets its result beside Crippa et al. 2016, which estimated about 195 deaths a day across Indonesia, Malaysia and Singapore during the 2015 haze. The September 2026 estimate is about 177 deaths a day in Indonesia alone.

Policy context

CREA reads fire radiative power in Kalimantan, Sulawesi and Papua as above the 2015 record. It notes that the 2026 BNPB budget fell by 75 percent, from Rp2 trillion to Rp491 billion. Parliament and environmental groups asked for a national disaster declaration, and protests took place on October 20. No declaration had been made when CREA published.

CREA recommendations

CREA calls for a national clean air framework with binding air quality standards, open monitoring data and enforcement across provinces. It also asks for stronger peatland restoration and tighter emission standards for power, industry and transport.

Method and limits

CREA takes daily PM2.5 at about 11 km from the Tracking Air Pollution product of Tsinghua University and corrects it against 186 reference monitors in 118 cities. The model read about half the measured level in fire provinces in August, so the correction matters. Areas more than 250 km from a monitor keep the uncorrected values. Fire smoke raises all-cause deaths by 1.7 percent for each 10 micrograms over a three-day mean, from Chen et al. 2021. Baseline deaths come from the Global Burden of Disease 2023. The intervals cover only the risk factors.

A predictable disaster

The Indonesian press release for this analysis cites Agus Sari, co-founder and chief executive officer of Landscape Indonesia and a member of the expert council of Perhimpunan Filantropi Indonesia (PFI). He points to weak government preparation for the fires that made the air worse. He sees the disaster as predictable and avoidable, and the breaches of law behind it as foreseeable. Indonesia should have been able to prepare for what was coming, and its complete lack of preparation comes down to a lack of will. The warning signs came early. NOAA issued its El Niño advisory on June 11, 2026, and Landscape set out the risk in *Fire on the Horizon* in June.

Sources

Main source. Hasan, Katherine, Hubert Thieriot, Candini Candanila and Lauri Myllyvirta. 2026. "Indonesia's air pollution deaths surged by 42% in September as government resists declaring 'karhutla' a national emergency." Centre for Research on Energy and Clean Air, October 29, 2026. energyandcleanair.org, accessed on November 2, 2026.

Method. CREA. 2026. "Supplemental information. Methodology, Reference, and Appendix," Tables A1 and A2. **Quote.** CREA press release in Indonesian, October 29, 2026. **Reporting.** AFP. 2026. "Fire pollution killed 3,560 people in Indonesia in September: report." The Korea Times, October 30, 2026. **Landscape.** Landscape Advisory karhutla health cost model, August 27, 2026, unpublished.