Winter ambient air quality snapshot for India

Winter 2025

Summary

- Data: Continuous ambient air quality monitoring stations (CAAQMS) data from Central Pollution Control Board has been analyzed for the winter period from October 1, 2024, to February 28, 2025 (winter 2024-25). Only cities with at least 80% data availability during this period have been considered for the analysis.

- Compliance: In winter 2024-25, 173 out of 238 cities with more than 80% of the days with CAAQMS data recorded $PM_{2.5}$ concentrations above India's National Ambient Air Quality Standards (NAAQS) of 40 µg/m³. None of 238 cities complied with the World Health Organization's (WHO) safe guideline concentration of 5 µg/m³.

  - NCAP cities: The winter average $PM_{2.5}$ levels in 78 National Clean Air Programme (NCAP) cities out of 98 cities surpassed India's NAAQS for $PM_{2.5}$, while all 98 cities exceeded the WHO guidelines.

  - Non-NCAP cities: Among the 140 non-NCAP cities data, 95 cities reported winter average $PM_{2.5}$ levels above the NAAQS. All 140 cities exceeded the WHO guideline.

- $PM_{2.5}$ Air Quality Index (AQI) category: In winter 2024-25, the number of cities with 'Good' (0-30 µg/m³) air quality stood at 28. Meanwhile, cities experiencing 'Satisfactory' (31-60 µg/m³) air quality were recorded at 115. The number of cities with 'Moderate' (61-90 µg/m³) air quality reached 77. Additionally, 15 cities reported 'Poor' (91-120 µg/m³) air quality, while 3 cities fell under the 'Very Poor' (121-250 µg/m³) category.

- Most polluted city: **Delhi ranked as the most polluted city in India in winter 2024-25**, recording a average $PM_{2.5}$ concentration of 159 µg/m³.

  - Byrnihat was the second most polluted city in India during Winter 2025, with average $PM_{2.5}$ of 157 µg/m³.

  - Hajipur, Ghaziabad, Gurgaon, Noida, Patna, Asanol, Durgapur, and Charkhi Dadri were in the top 10 cities, with Hajipur and Charkhi Dadri in third and tenth place, respectively.

- - Bihar, Uttar Pradesh, Haryana, and West Bengal accounted for two cities each India's top 10 most polluted cities along with one each in Assam and Delhi.
- State with most polluted cities: Rajasthan (34 cities), Bihar (24 cities), West Bengal (7 cities) and Haryana (3 cities) are the states where all the monitored cities exceeded NAAQS. Maharashtra (30 out of 31 cities exceeded NAAQS), Odisha (15 out of 16 cities), Uttar Pradesh (15 out of 20 cities), Madhya Pradesh (13 out of 15 cities), and Punjab (7 out of 8 cities) states also had a high proportion of polluted cities.
- Cleanest city: **Aizawl, in the state of Mizoram, was the cleanest city in India during winter**, with a winter average $PM_{2.5}$ of 7 µg/m³. The top 10 cleanest cities comprise six cities from Karnataka, three from Tamil Nadu, and one from Mizoram.
- Frequency in top 10 polluted cities: **A total of 100 cities were featured in the top 10 most polluted cities list in Winter 2024-25**. Of these, 44 cities made an appearance at least ten times over the 151-day period, topped by Byrnihat, which featured the most times (111 days), followed by Delhi (105 days), Hajipur (80 days), Ghaziabad (52 days), and Bahadurgarh (47 days).
- NCAP: **Only 33 out of the 100 cities featured in the top 10 most polluted cities list during Winter 2024-25 are part of the National Clean Air Programme (NCAP)**. The remaining 67 cities have no action plan to reduce hazardous air pollution concentrations.
- Winter Data Gaps: During winter, no data was available for even a single day from the CAAQMS stations in Darbhanga, Ernakulam, Hosur, Kochi, Kozhikode, Pathardih, and Thoothukudi.
  - A total of 44 cities had less than 80% data coverage, with Haryana alone accounting for 21 such cities. While data for all 24 cities in Haryana was initially available on the CPCB portal at the start of winter, CAAQMS stations in many cities stopped reporting in December. By the end of winter, only Charkhi Dadri, Faridabad, and Gurgaon had 80% data coverage, while data from the remaining 21 cities, crucial for assessing winter pollution was unavailable.
  - Other affected cities were located in Tamil Nadu, Jharkhand, Sikkim, Manipur, Kerala, Gujarat, Chhattisgarh, and Bihar.

Data coverage and compliance with standards

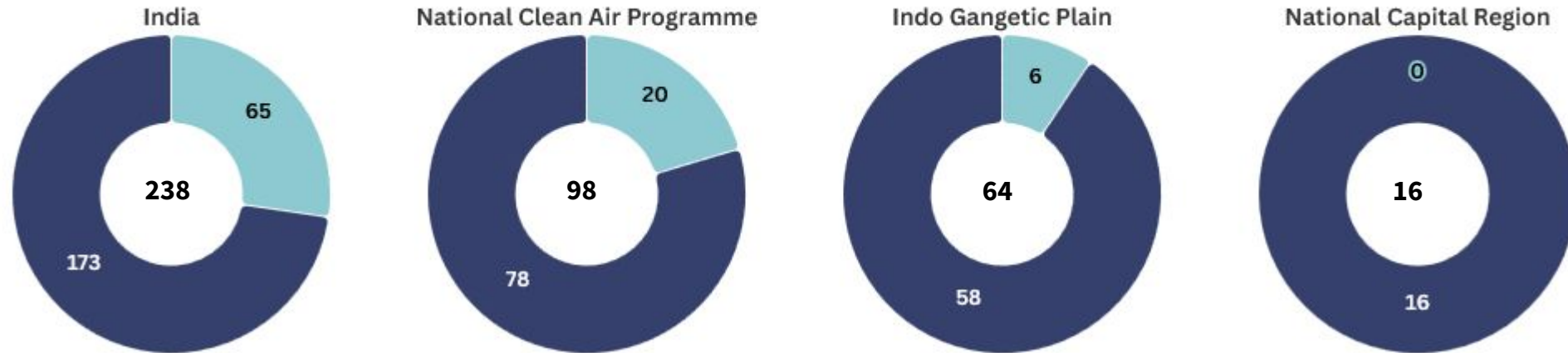| Total number (#) of cities covered by Continuous Ambient Air Quality Monitoring Station (CAAQMS)	# of cities with >80% of the days with CAAQMS data	# of cities with <80% but >1% of the days with CAAQMS data	# of cities with CAAQMS installed but no available data
289	238	44	7

National Clean Air Programme (NCAP) cities with CAAQMS			Non-NCAP cities with CAAQMS		
102			187		
# of NCAP cities with >80% of the days with CAAQMS data	# of NCAP cities with <80% of the days with CAAQMS	# of NCAP cities with CAAQMS installed but no available data	# of Non-NCAP cities with >80% of the days with CAAQMS data	# of Non-NCAP cities with <80% of the days with CAAQMS	# of Non-NCAP cities with CAAQMS installed but no available data
98	3	1	140	41	6

Standard	Number of cities	NCAP Cities	Non-NCAP cities	Total Indian Cities
National Ambient Air Quality standards of India (40 µg/m3)	Exceeding	78	95	173
	Complying	20	45	65
World Health Organization Standard (5 µg/m3)	Exceeding	98	140	238
	Complying	0	0	0

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PM2.5 compliance and AQI categories by city groups

PM2.5 compliance status by area

■ Number of Cities < NAAQS ■ Number of Cities > NAAQS

India
65
238
173

National Clean Air Programme
20
98
78

Indo Gangetic Plain
6
64
58

National Capital Region
0
16
16

Count of cities AQI categories by area for PM2.5

■ Very Poor ■ Poor ■ Moderate ■ Satisfactory ■ Good

India
28 3 15
238
77
115

National Clean Air Programme
6 2 8
98
36
46

Indo Gangetic Plain
3 2 12
18
64
29

National Capital Region
0 1
3
16
7
5
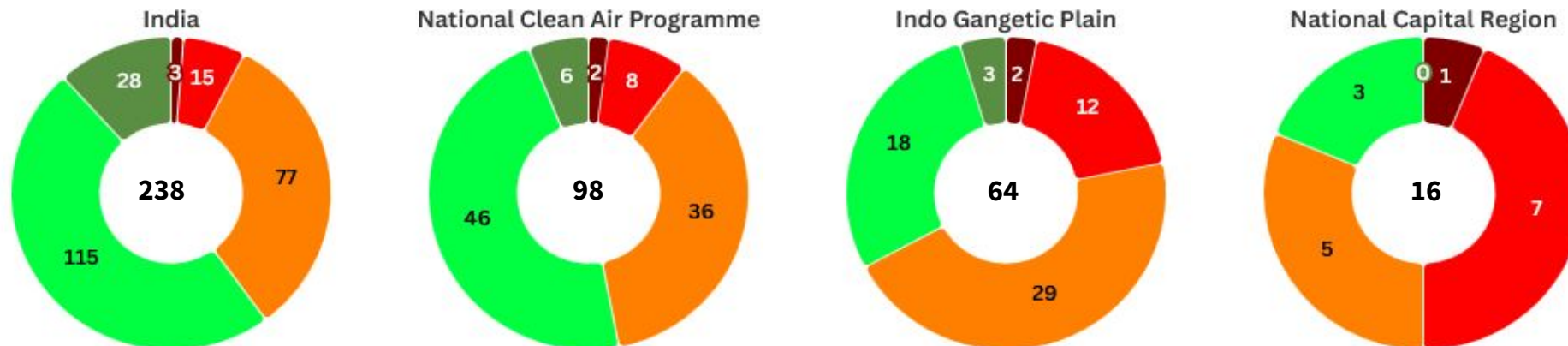
Note: Of 131 cities, 102 have CAAQMS, but only 98 meet the 80% data availability threshold. In IGP, 89 cities have CAAQMS, but only 64 meet this criterion, while in NCR, only 16 of 29 do. This data gap is primarily due to only 3 out of 24 stations in Haryana not reporting data.

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Top 10 most polluted cities in India by PM$_{2.5}$ concentration – Winter 2025

Days in respective AQI categories based on PM$_{2.5}$ (µg/m^3) – Winter 2024-25							
City	Monitored days	Days > NAAQS	Good (0-30)	Satisfactory (31-60)	Moderate (61-90)	Poor (91-120)	Very poor (121-250)	Severe (>250)
Delhi	151	143	0	8	26	23	74	20
Byrnihat	150	139	4	7	14	20	92	13
Hajipur	151	137	7	7	25	35	72	5
Ghaziabad	151	127	0	24	39	36	46	6
Gurgaon	151	137	0	14	47	43	45	2
Noida	151	123	1	27	43	32	47	1
Patna	151	136	4	11	43	56	37	0
Asanol	151	132	2	17	44	55	33	0
Durgapur	151	130	2	19	59	35	36	0
Charkhi Dadri	151	133	0	18	58	43	31	1

Top 10 most polluted cities in India by PM2.5 concentrations (µg/m3) – Winter 2024-25
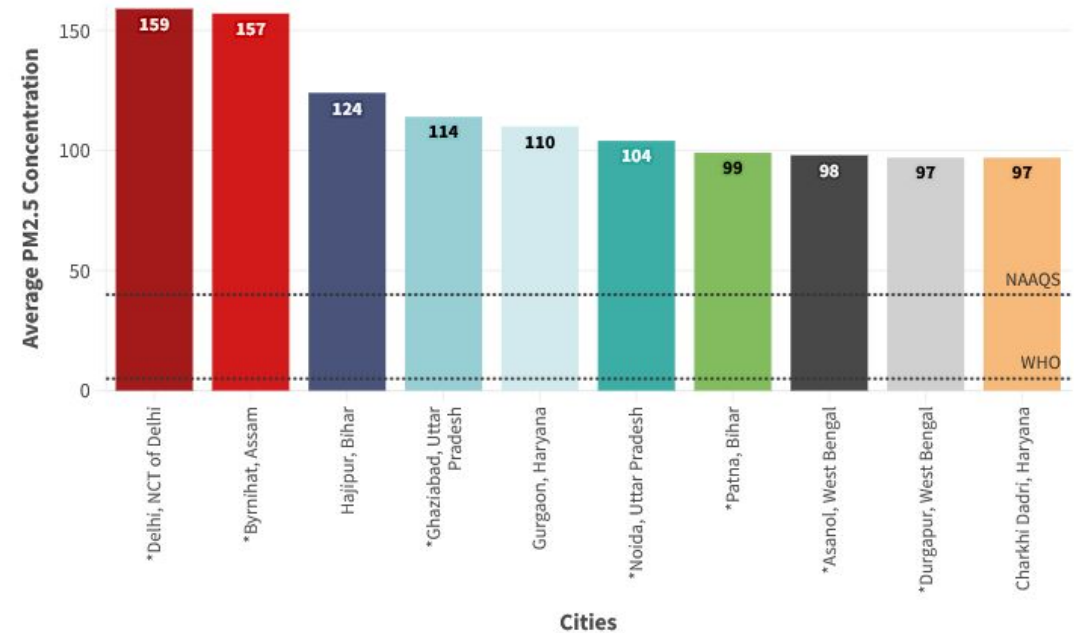
Source: CCR
* NCAP cities

Top 10 cleanest cities in India by PM$_{2.5}$ concentration – Winter 2024-25

| Days in respective AQI categories based on PM$_{2.5}$ (µg/m3) – Winter 2025							
City	Monitored days	Days > NAAQS	Good (0-30)	Satisfactory (31-60)	Moderate (61-90)	Poor (91-120)	Very poor (121-250)	Severe (>250)
Aizawl	142	0	140	2	0	0	0	0
Gadag	137	1	119	17	1	0	0	0
Chamarajanagar	151	0	151	0	0	0	0	0
Madikeri	151	0	133	18	0	0	0	0
Chikkamagaluru	143	0	128	15	0	0	0	0
Shivamogga	149	0	149	0	0	0	0	0
Palkalaiperur	133	0	103	30	0	0	0	0
Vijayapura	141	0	139	2	0	0	0	0
Tirupur	141	0	102	39	0	0	0	0
Ramanathapuram	148	0	119	29	0	0	0	0

Top 10 cleanest cities in India by PM2.5 concentration - Winter 2024-2025
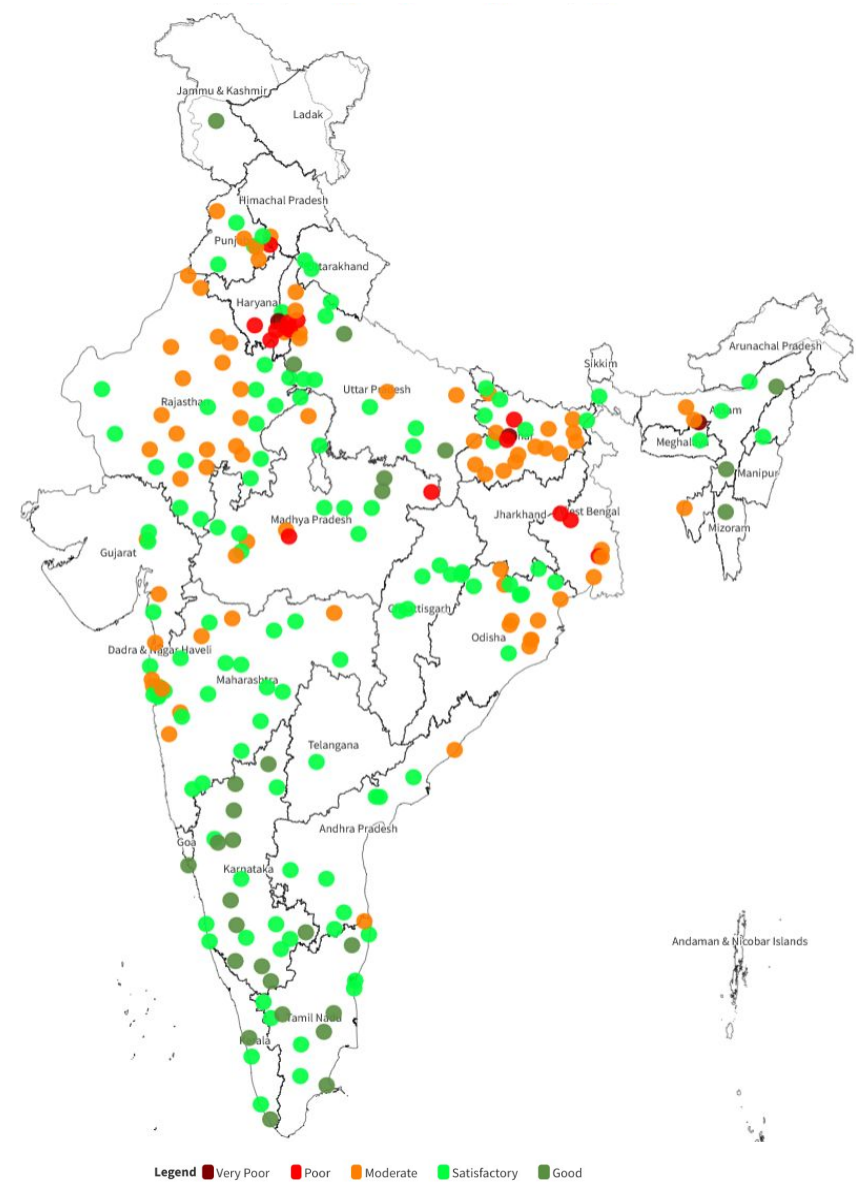
Source: CCR

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# State wise compliance and exceedance during Winter 2024-25
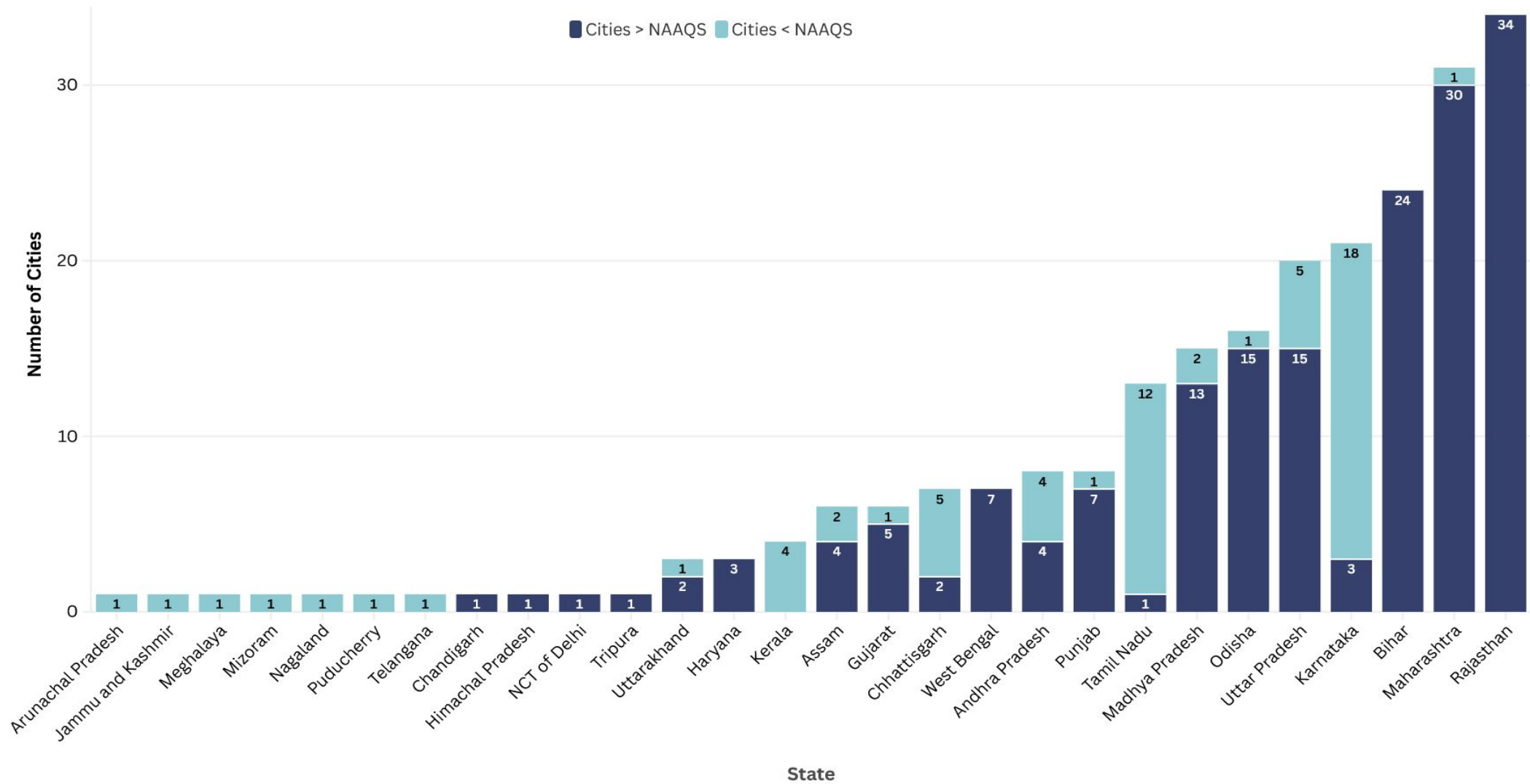
Note: NAAQS- PM2.5 Annual National Ambient Air Quality Standards of India (40μg/m3)

Distribution of cities by PM2.5 Air quality Index based on winter average PM$_{2.5}$ concentrations – Winter 2025

| State/UT	Number of cities in AQI category (PM$_{2.5}$ µg/m^3)				
	Good (0-30)	Satisfactory (31-60)	Moderate (61-90)	Poor (91-120)	Very Poor (121-250)
Andhra Pradesh	0	7	1	0	0
Arunachal Pradesh	0	1	0	0	0
Assam	2	1	2	0	1
Bihar	0	6	15	2	1
Chandigarh	0	0	0	1	0
Chhattisgarh	0	7	0	0	0
Gujarat	0	3	3	0	0
Haryana	0	0	1	2	0
Himachal Pradesh	0	0	1	0	0
Jammu and Kashmir	1	0	0	0	0
Karnataka	12	10	0	0	0
Kerala	2	2	0	0	0
Madhya Pradesh	2	7	4	2	0
Maharashtra	0	22	9	0	0
Meghalaya	0	1	0	0	0
Mizoram	1	0	0	0	0
Nagaland	0	1	0	0	0
NCT of Delhi	0	0	0	0	1
Odisha	0	7	9	0	0
Puducherry	0	1	0	0	0
Punjab	0	4	4	0	0
Rajasthan	0	16	17	1	0
Tamil Nadu	5	7	1	0	0
Telangana	0	1	0	0	0
Tripura	0	0	1	0	0
Uttar Pradesh	3	7	6	4	0
Uttarakhand	0	3	0	0	0
West Bengal	0	1	3	3	0

Frequency of appearance of respective cities in top 10 most polluted cities in India list by $PM_{2.5}$ concentration – Winter 2024-25
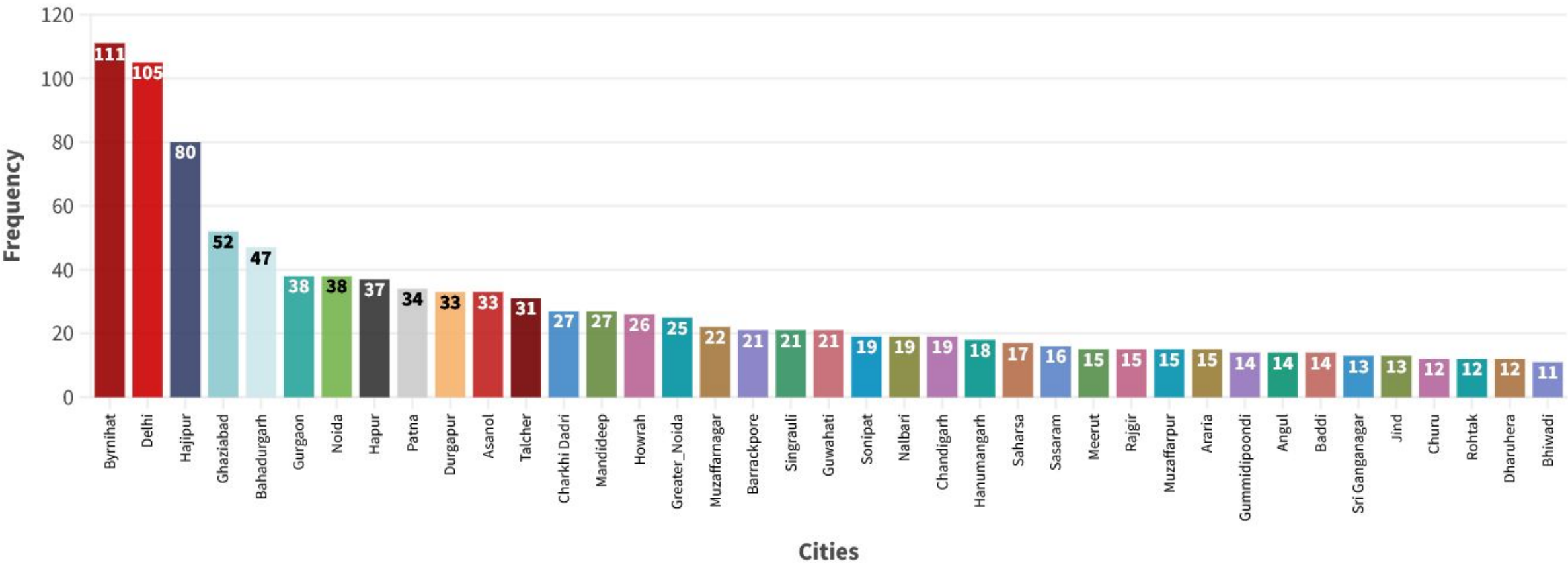
Source: CCR • Note: Cities appeared more than 10 times in top 10 list are only shown here

State-wise most polluted cities (PM$_{2.5}$, µg/m³) in India during Winter 2024-25

Source: CCR

CREA
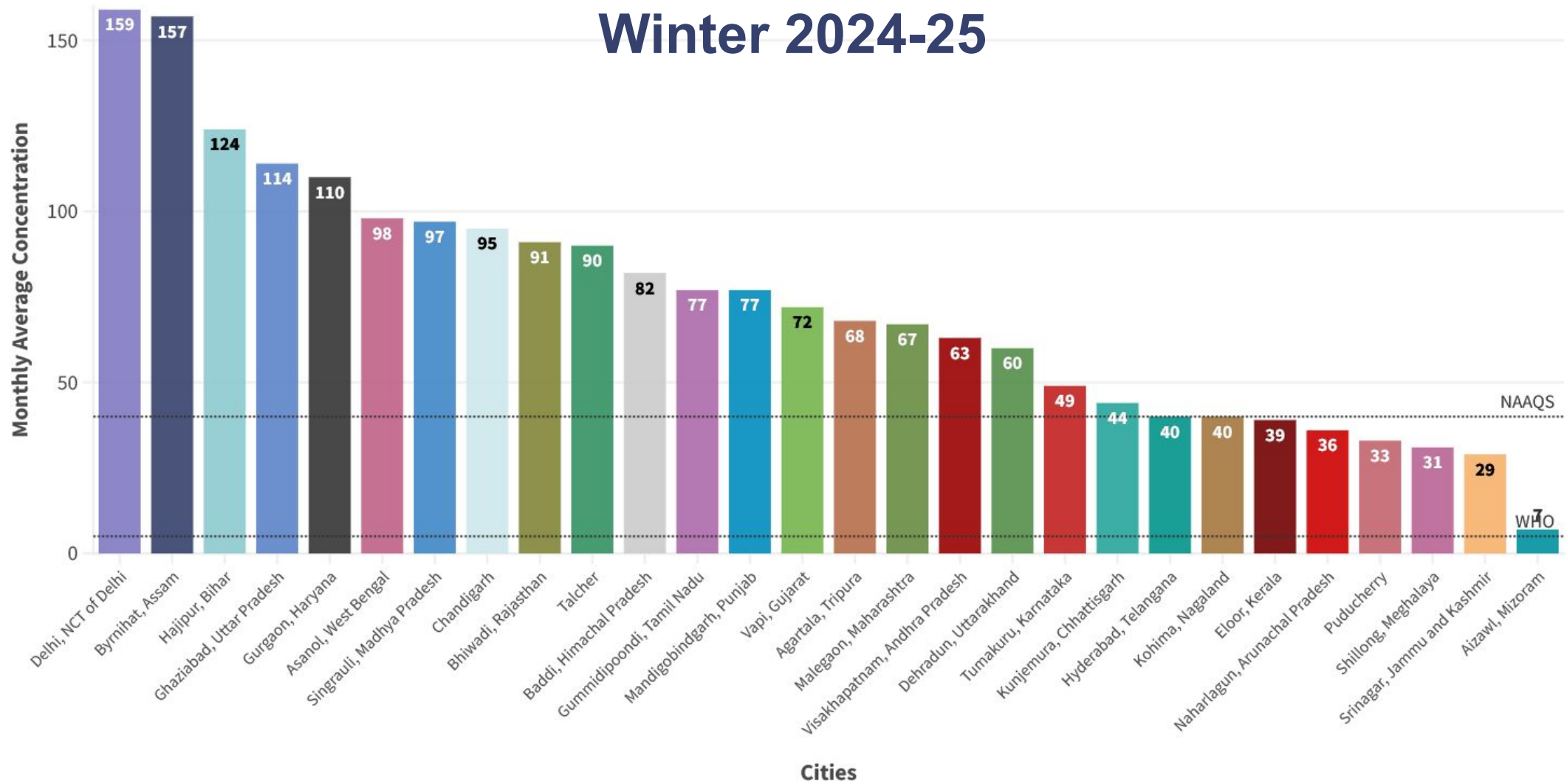
PM$_{2.5}$ concentrations across state/provincial capital cities in India – Winter 2024-25

Source: CCR

Itanagar (Arunachal Pradesh); Dispur (Assam); Panaji (Goa); Shimla (Himachal Pradesh); Ranchi (Jharkhand); Port Blair (Andaman and Nicobar Islands); Daman (Dadra and Nagar Haveli and Daman & Diu); Leh (Ladakh); and Kavaratti (Lakshadweep) don't have an operational CAAQMS.

Data sources

Ambient air quality data recorded by Continuous Ambient Air Quality Monitoring Stations (CAAQMS) is downloaded from the '[Central Control Room for Air Quality Management - All India'](#) dashboard operated by the Central Pollution Control Board (CPCB).

Resources

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