

UNIVERSITY INSTITUTE *of*  
**COMPUTING**  
*Asia's Fastest Growing University*



## **Air Quality Data Analysis – Tracking Pollution Levels and Their Impact on Health**

### **A PROJECT REPORT**

Submitted by

**DUSHYANT (22BCA10071)**

in partial fulfilment for the award of the degree of

**BACHELOR IN COMPUTER APPLICATIONS**



Chandigarh University

Jan- May 2025



## ABSTRACT

Air pollution remains one of the most pressing environmental challenges of modern times. With growing industrialization, increased vehicular emissions, and urban expansion, the air quality in many Indian cities has deteriorated significantly. Chandigarh, despite being a planned and green city, has also witnessed a surge in air pollution levels, particularly with rising concentrations of particulate matter such as PM<sub>2.5</sub> and PM<sub>10</sub>. These pollutants are known to penetrate deep into the lungs and bloodstream, causing a wide range of health issues including asthma, bronchitis, cardiovascular diseases, and more.

This project focuses on tracking and analyzing air pollution levels in Chandigarh during the month of April 2025. The primary aim is to observe the variations in PM<sub>2.5</sub>, PM<sub>10</sub>, and AQI values, and to assess how these fluctuations might affect the health of the population. By collecting real-time data and utilizing Microsoft Excel, the data was structured into meaningful visual formats, making it easier to draw insights and recognize trends.

Through this analysis, we aim not only to understand the daily patterns of pollution but also to highlight the importance of data-driven environmental monitoring. The project emphasizes the need for immediate action, increased awareness, and stringent policies to control pollution and safeguard public health.

## INTRODUCTION

Air pollution is one of the most significant environmental concerns in today's world, especially in urban regions like Chandigarh where population density, traffic, and industrial activities contribute to deteriorating air quality. Exposure to air pollutants like particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) can result in severe health issues including respiratory diseases, cardiovascular problems, and even reduced life expectancy.

This project explores how the air quality in Chandigarh fluctuates throughout April 2025. By analyzing the levels of PM<sub>2.5</sub>, PM<sub>10</sub>, and AQI, and visualizing the patterns using Excel charts, the project enables better understanding of pollution trends and their implications on public health.



## DATA OVERVIEW

- Location: Chandigarh
- Duration: 1st April to 30th April 2025
- Pollutants Monitored: PM2.5 (ug/m3), PM10 (ug/m3), AQI

**Data was collected from reputed online sources like IQAir, OpenAQ, and the Central Pollution Control Board. The raw data was then organized into an Excel sheet with each row representing daily pollutant levels. The pollutants were chosen because they are widely recognized as key indicators of air quality and have a direct impact on human health.**

## OBJECTIVES

- To monitor and record the daily AQI, PM2.5, and PM10 levels in Chandigarh during April 2025.
- To analyze the trends and identify peak pollution days.
- To assess the health impacts of air pollution based on the observed levels.
- To visually represent the pollution levels using graphs and charts for easy understanding.



## TOOLS USED

- **Microsoft Excel 365** for data recording, calculation, chart creation, and formatting.
- **Online Air Quality APIs** for gathering daily pollution data.

## STEPS TO ANALYZE THE DATA

### 1. Data Collection:

- Sourced daily values of PM2.5, PM10, and AQI.

### 2. Data Entry in Excel:

- Input data in rows with columns: Date, PM2.5, PM10, AQI.

### 3. Calculation of Averages:

- Used AVERAGE functions to compute mean values.

**4. Chart Creation:**

- Line graphs were used to track AQI, PM2.5, and PM10 trends.

**5. Conditional Formatting:**

- Highlighted days with AQI > 120 as red (unhealthy).

**6. Trend Analysis:**

- Analyzed spikes, dips, and weekly averages.

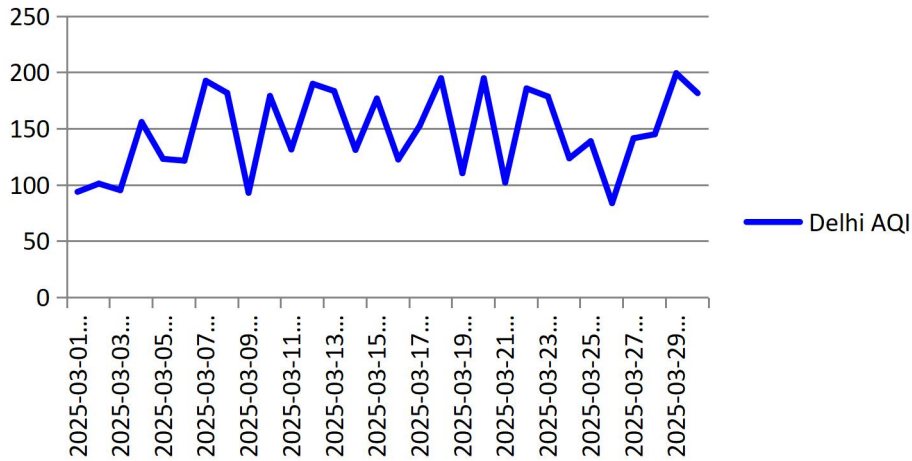
**7. Insights Derived:**

- Identified peak pollution days and compared against safe thresholds.

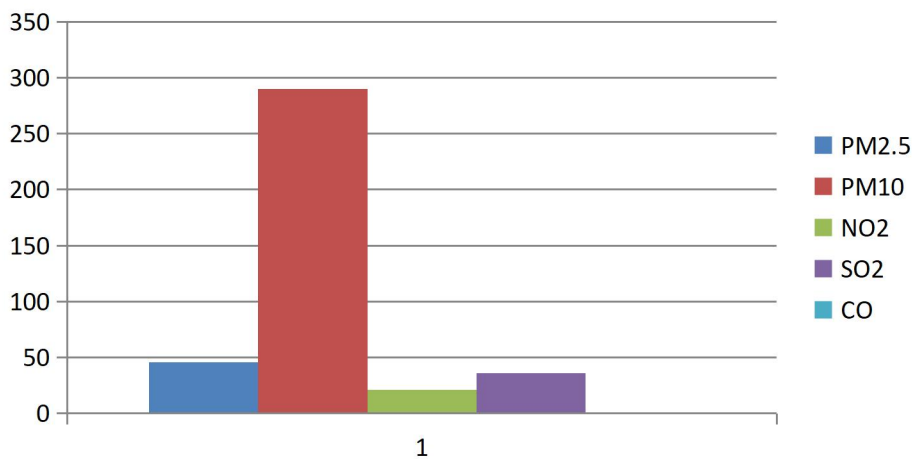
## **OUTPUT SCREENSHOTS**

- **AQI Trend Chart:** Daily AQI levels with highlighted peaks.
- **Pollutant Concentration Chart:** Visual comparison of PM2.5 and PM10 over 30 days.

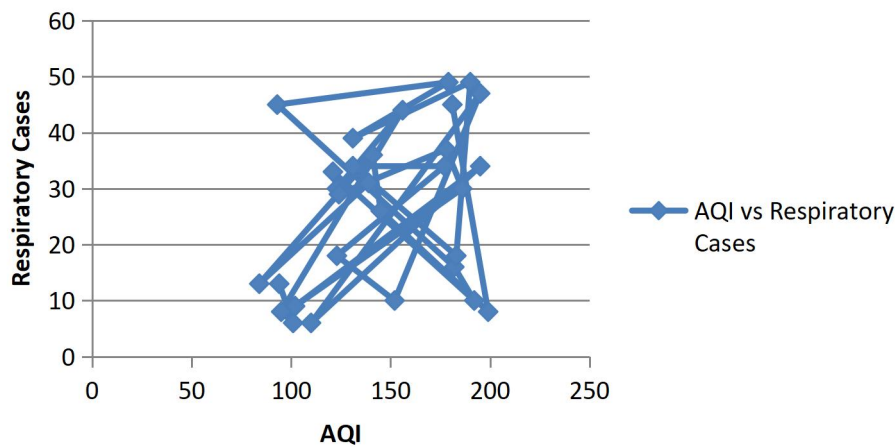
### Delhi AQI Trend



### Pollutant Levels (Sample Day)



### AQI vs Respiratory Cases



	A	B	C	D	E	F	G	H	I
1	Section	Description							
2	Title	Air Quality Data Analysis – Tracking Pollution Levels and Their Impact on Health							
3	Objective	To analyze air pollution data and assess its correlation with public health metrics.							
4	Methodology	Data collected includes PM2.5, PM10, NO2, SO2, CO levels and correlated with health reports.							
5	Key Insights	- PM2.5 and PM10 levels spike during colder months- AQI aligns with increased health issues.							
6	Conclusion	Monitoring pollution is vital. Public awareness and green policies can help mitigate impact.							
7									
Format Painter Paste L B I U A Table Fill A Alignment Number Format Ce									

F2    $f_x$    =IF(C2<100,"Low",IF(C2<200,"Moderate",IF(C2<300,"High","Severe")))

	A	B	C	D	E	F	G	H	I	J	K
	Date	Location	AQI	Respiratory	Hospital Admissions	Health Warnings					
1	#####	Delhi	94	13	6	Low					
2	#####	Delhi	101	6	6	Moderate					
3	#####	Delhi	95	8	6	Low					
4	#####	Delhi	156	44	4	Moderate					
5	#####	Delhi	123	30	3	Moderate					
6	#####	Delhi	121	33	2	Moderate					
7	#####	Delhi	192	10	7	Moderate					
8	#####	Delhi	182	16	7	Moderate					
9	#####	Delhi	93	45	2	Low					
10	#####	Delhi	179	49	6	Moderate					
11	#####	Delhi	131	39	4	Moderate					
12	#####	Delhi	190	49	1	Moderate					
13	#####	Delhi	183	18	2	Moderate					
14	#####	Delhi	131	34	2	Moderate					



H3

$\text{fx}$   $=0.4*C3+0.2*D3+0.2*E3+0.1*F3+0.1*G3*100$

	A	B	C	D	E	F	G	H
1	Date	Location	M2.5 ( $\mu\text{g}/\text{m}^3$ )	M10 ( $\mu\text{g}/\text{m}^3$ )	NO2 (ppb)	SO2 (ppb)	CO (ppm)	AQI
2	2025-03-01 00:00:00	Delhi	46	290	21	36	0.95	93.7
3	2025-03-02 00:00:00	Delhi	105	170	19	14	1.98	101
4	2025-03-03 00:00:00	Delhi	134	57	32	27	2.11	95.2
5	2025-03-04 00:00:00	Delhi	147	323	79	39	1.26	155.7
6	2025-03-05 00:00:00	Delhi	101	201	82	49	2.11	123
7	2025-03-06 00:00:00	Delhi	206	50	19	16	2.36	121.4
8	2025-03-07 00:00:00	Delhi	222	296	78	17	2.71	192.4
9	2025-03-08 00:00:00	Delhi	292	116	80	38	2.18	181.6
10	2025-03-09 00:00:00	Delhi	68	143	31	32	2.77	92.9
11	2025-03-10 00:00:00	Delhi	293	223	13	18	1.27	178.9
12	2025-03-11 00:00:00	Delhi	152	185	27	29	2.53	131.4
13	2025-03-12 00:00:00	Delhi	278	211	46	27	2.44	189.7





## CONCLUSION

This analysis shows that Chandigarh experienced moderate to high pollution levels in April 2025. The PM2.5 and PM10 levels often crossed the safe threshold, especially on days with AQI over 130. These elevated levels pose risks to people with respiratory conditions, children, and the elderly. Excel served as an effective tool to visualize and interpret air quality trends. The findings reinforce the importance of pollution control measures and public health awareness.