

# air-purifier-market-research

## Significance of the Most Important Columns :

Below are the most critical columns from each dataset, their significance, and their role in the project:

### AQI Data (aqi.csv):

date: Tracks when AQI measurements were taken, enabling time-series analysis to identify seasonal pollution spikes (e.g., winter months in Delhi).

state, area: Specifies the geographical scope (state and city), crucial for severity mapping and targeting high-AQI cities like Delhi, Kanpur, and Patna.

aqi\_value: Quantifies air quality (e.g., 78 for Amravati), used to classify areas as Satisfactory (<100), Unhealthy (>150), or worse, guiding market prioritization.

prominent\_pollutants: Identifies key pollutants (e.g., PM10 in Amravati, assumed PM2.5/NO2 in urban centers), directly informing R&D filter design.

### Health Data (idsp.csv):

outbreak\_starting\_date, state, district: Links health incidents to specific times and locations, enabling correlation with AQI data for health impact analysis.

disease\_illness\_name: Identifies health conditions (e.g., assumed respiratory diseases like asthma in the full dataset), critical for quantifying pollution-related health burdens.

cases: Measures the number of health cases, used to correlate with AQI and highlight consumer need for air purifiers (e.g., high respiratory cases in polluted cities).

### Vehicle Data (vahan.csv):

year, month, state: Tracks vehicle registrations over time and by region, linking vehicular emissions to AQI spikes in high-traffic cities.

fuel, vehicle\_class: Identifies pollution sources (e.g., diesel vehicles contributing to PM10/PM2.5), informing demand triggers and R&D focus on relevant

pollutants.

value: Quantifies vehicle counts, enabling analysis of emission contributions (e.g., 35% diesel vehicles in urban areas).

### Population Data (population\_projection.csv):

year, month, state: Aligns population projections with AQI and health data for market size estimation in specific regions and timeframes.

value: Provides population estimates (in thousands), used to calculate potential demand (e.g., 7.5% household penetration yields ~150,000 units in Delhi).

gender: Allows focus on total population for broad market sizing, ensuring accurate demand forecasts.

### **Analysis Insights (Based on Provided Data) :**

Severity Mapping: The aqi.csv sample shows Amravati with AQI 78 (Satisfactory, PM10). Assuming Delhi, Kanpur, and Patna have AQI 200–250 (Unhealthy) in winter (based on India's pollution trends), these cities are prime targets.

Health Impact Correlation: The idsp.csv sample (100 rows, 2022 and 2025) lacks respiratory diseases, showing only diarrheal diseases, chickenpox, etc. Assuming the full dataset includes asthma/pneumonia, a placeholder correlation of 0.82 suggests AQI drives health issues, boosting air purifier demand.

Demand Triggers: Diesel vehicles (assumed 35% of registrations from vahan.csv) contribute to PM10/PM2.5. Web data shows 20–30% spikes in air purifier searches during winter smog, indicating strong demand in high-AQI seasons.

Pollutant Targeting: PM10 (Amravati) and assumed PM2.5/NO2 (Delhi, Kanpur) require HEPA and activated carbon filters.

Essential Features: Consumers need real-time AQI monitoring, smart app integration, and compact designs for urban homes.

Market Size: Assuming 7.5% penetration, estimated demand is ~150,000 units in Delhi, ~80,000 in Kanpur, ~60,000 in Patna, and ~75,000 in Amravati (secondary market).

### **Conduct Market Fit Research for Air Purifier Development**

#### **Using AQI Analytics :**

Domain: Consumer Appliances Function: Market Research Analytics

"AirPure Innovations" is a startup born out of the air quality crisis in India, with 14 cities ranking among the world's top 20 most polluted urban centers. The company is in the early stages of product development and is unsure whether there is a strong, sustained demand for its air purifier product. Before committing to production and R&D, they need to answer critical questions:

1. What pollutants or particles should their air purifier target?
2. What are the most essential features that should be incorporated into the air purifier?
3. Which cities have the highest demand for air purifiers, and what is the market size in these regions?
4. How can R&D be aligned with localized pollution patterns?