सत्यमेव जयते
Government of India
Ministry of Health and Family Welfare

National Programme on Climate Change and Human Health

Health Advisory on Air Pollution

File No. F.No.70/NCDC/CEOH&CCH/2018-19/AP_Advisory (Computer No. 3176972)
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National Programme on Climate Change &Human Health
National centre for Disease Control
Directorate General of Health Services
MoHFW

October 2025

Purpose of the Document

The present health advisory document on air pollution and health is meant for the health department in the states including the programme officials to enable them in developing certain appropriate mechanisms to address health issues arising due to exposure to air pollution in their respective areas. This includes a background understanding of the present burden of diseases attributed to air pollution, major sources of pollution, vulnerable groups, its health effects and main symptoms and understanding of air quality information in their respective areas.

The document also provides suggestions to the state health department on ways to obtain the air quality information from pollution control board for making people aware of the potential health issues and informed them of protective and preventive health measures. The addressing mechanisms also mention on ways to focus on strengthening of health care service provisions in the health facilities, its preparedness and response actions during high air pollution level. It further mentions of health sector strengthening measures like health action plan development, considerations of air pollution and few action points for health sector in Delhi NCR. It also suggested IEC messages for widespread public health communication on Do's and Dont's to protect, prevent and control health issues of the general population and also, for those having medically underlying diseases. Some of the social media messages are also added for reference purposes. There is an addition for messages particularly for households and for school children in the country.

The document has provided important links to access relevant documents on air pollution and health issues like the technical documents, IEC materials, training modules etc. developed under NPCCHH and others for references of the state officials.

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Contributors

The present document on Health Advisory on Air Pollution, 2025 under NPCCHH (MoHFW) is updated from the previous public health advisory on air pollution.

The advisory was developed with the inputs from Technical Expert Group (TEG)members on Air pollution and Human Health under NPCCHH, inputs from CPCB and other relevant stakeholders working on air pollution and health. The following are the TEG and other experts participated in the development of the advisory.

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The programme is very grateful to all those who have provided valuable inputs in the document to help address the health issues of the people impacted due to exposure to air pollution in the country. The Programme Division has updated the advisory with latest provisions under NPCCHH, NHM.

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Contents

File No. F.No.70/NCDC/CEOH&CCH/2018-19/AP_Advisory (Computer No. 3176972)
Generated from eOffice by BRIJ MOHAN MALIK, O/O SECY -PPS(BMM)-MOHFW, PPS, DOHFW DEPARTMENT on 31/10/2025 06:45 pm

Glossary of Abbreviations

AIIMS	All India Institute of Medical Sciences Delhi
AP	Air Pollution
AQEWS	Air Quality Early Warning System
AQI	Air Quality Index
CAAQMS	Continuous Ambient Air Quality Monitoring Stations
CHCs	Community Health Centres
CHO	Community Health Officer
CNS	Cerebrovascular Strokes
CO	Carbon Monoxide
COPD	Chronic Obstructive Pulmonary Disease
CPCB	Central Pollution Control Board
CVD	Cardio Vascular Disease
CVS	ischaemic heart diseases
DALY	Disability-Adjusted Life Year
DHs	District Hospitals
DNO-CC	District Nodal Officer Climate Change
ED	Emergency Department
GoI	Government of India
HAP	Health Action Plan
HCFs	Health Care Facilities
HIRA	Hazard Identification and Risk Assessment
ICMR	Indian Council of Medical Research
IEC	Information Education Communication
IIT	Indian Institute of Technology
IITM	Indian Institute of Tropical Meteorology
IMD	Indian Meteorological Department
LCF	Lung Care Foundation
LED	Light-Emitting Diode
LPG	Liquefied Petroleum Gas
MO	Medical Officer
MoEFCC	Ministry of Environment Forest and Climate Change
MoES	Ministry of Earth Sciences
MoHFW	Ministry of Health and Family Welfare
NCAP	National Clean Air Programme
NCD	Non-Communicable Diseases
NCDC	National Centre for Disease Control
NOx	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NPCCHH	National Programme on Climate Change and Human Health
OPD	Out-Patient Department
PGIMER	Post Graduate Institute of Medical Education & Research, Chandigarh
PHCs	Primary Health Centers
PHFI	Public Health Foundation of India
PM	Particulate Matters
PPE	Personal Protective Equipment
PWD	Public Works Department
PUC	Pollution Under Control
SBS	Sick Building Syndrome
SDHs	Sub-District/Divisional Hospitals
SMOG	Smoke + Fog
SNO-CC	State Nodal Officers Climate Change
SOP	Standard Operating Procedures
SO_2	Sulphur Dioxide
SRIHER	Sri Ramachandra Institute for Higher Education & Research
TEG	Technical Expert Group
ToT	Training of Trainers
UNEP	United Nations Environment Programme
VOCs	Volatile Organic Compounds
WB	World Bank
WCD	Women and Child Development
WHA	World Health Assembly

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Health Advisory on Air Pollution (NPCCHH)

What is Air Pollution and its key pollutants?

Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere (WHO).

Key health harmful air pollutants include following-

- Particulate Matters ($PM_{2.5}$ and PM_{10}), Carbon Monoxide (CO), ground level Ozone (O_3), Volatile Organic Compounds, metals, [A1] Sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2).

Major sources of air pollution in the country are –

i. **Ambient (outdoor) air pollution** is from both anthropogenic and natural.
   a) Industrial emissions (through fossil fuel burning/ process and fugitive emission)
   b) vehicular exhaust
   c) re-suspension of road dust, construction and demolition activities,
   d) refuge burning (garbage, horticulture wastes, crop residues etc.)
   e) use of solid fuels for cooking and burning of firecrackers etc.

ii. **Household (Indoor) air pollution** is caused by burning biomass such as
   a) wood, coal, dung, kerosene in chulhas or fireplaces for cooking and heating purposes.
   b) Others such as
      - by burning mosquito coils, incense sticks, cigarettes, bidis,
      - use of sprays, solvents, and fumes from chemicals used in building interiors etc.

iii. **Sick Building Syndrome (SBS)**: Building occupants experience acute health and comfort effects which appear to be linked to time spent in a building, but no specific illness or cause can be identified is called Sick Building Syndrome (SBS).
   a) The complaints may be localized in a particular room or zone or may be widespread throughout the building.
   b) The major sources are inadequate ventilation, chemical and biological contaminants (molds and fungi) from indoor sources or outdoor sources, dust, smoke, fumes, fabric fibers, bright or flickering lights and problems with cleaning and layout

Understanding air quality/AQI levels and its health significance:

To avoid complexities in understanding the data and for its effective communication and to educate public on status of air pollution and its related health perspectives, Central Pollution Control Board has launched the mechanism of publishing Air Quality Index (AQI) depicted in easily understandablesix (6) colour code categories with their likely health impacts as

i. Good

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ii. Satisfactory

iii. Moderately polluted

iv. Poor

v. Very Poor

vi. Severe

AQI Considerations and its significance

- Air pollutants measured by real time analysers at Continuous Ambient Air Quality Monitoring Stations (CAAQMS)
  - First calculate moving averages of last 24 hours for individual pollutant
  - Then, the AQI sub-index for a particular pollutant is calculated and finally, the highest sub-index is declared as AQI of that day of the area or location.
- AQI value never indicates synergistic status of air pollution or impact of air pollution on health; rather it indicates about most problematic air pollutant

Worsening of Air Quality Index (higher AQI value) especially of 'poor to severe' in an area may lead to increase in health complications among those exposed particularly vulnerable populations such as children, elderly, individuals with underlying medical conditions etc.

Therefore, a general health advisory related to AQI is issued by CPCB with AQI bulletin as in table below-

Table: AQI levels, Health effects and Certain Protective Health Measures

Air Quality Index (AQI)# (Pollution level)	Possible Health Consequences	Advice for	
		General Population	Vulnerable Population*
Good (0-50)	Low risk	No special precautions	No special precautions
Satisfactory (51-100)	Minor breathing discomfort in vulnerable population*	No special precautions	Do less prolonged or strenuous outdoor physical exertion
Moderate (101-200)	Breathing or other health related discomfort in vulnerable population*	Do less prolonged or strenuous outdoor physical exertion	Avoid prolonged or strenuous outdoor physical exertion

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Poor (201-300)	Breathing discomfort in healthy people on prolonged exposure Breathing or other health related discomfort in vulnerable population*on short exposure	Avoid outdoor physical exertion	Avoid outdoor physical activities
Very Poor (301-400)	Respiratory illness in healthy people on prolonged exposure Pronounced respiratory or other illnesses in vulnerable population* on short exposure	Avoid outdoor physical activities, especially during morning and late evening hours	Remain indoors and keep activity levels low
Severe (401- 500)	Respiratory illness in healthy people on prolonged exposure Serious respiratory or other illnesses in vulnerable population* on short exposure	Avoid outdoor physical activities	Remain indoors and keep activity levels low

Sameer app from CPCB is a mobile app which can provide the city level hourly update of the National Air Quality Index (AQI) published by Central Pollution Control Board. Health Officials and general public may download it for use to get information of the air quality level in their respective areas.

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Health consequences of air pollution:

The health impacts of air pollution depend on the level of pollution and exposure duration. The individuals' vulnerability to the health impacts of pollution can also differ based on demographic factors and predisposing health conditions.

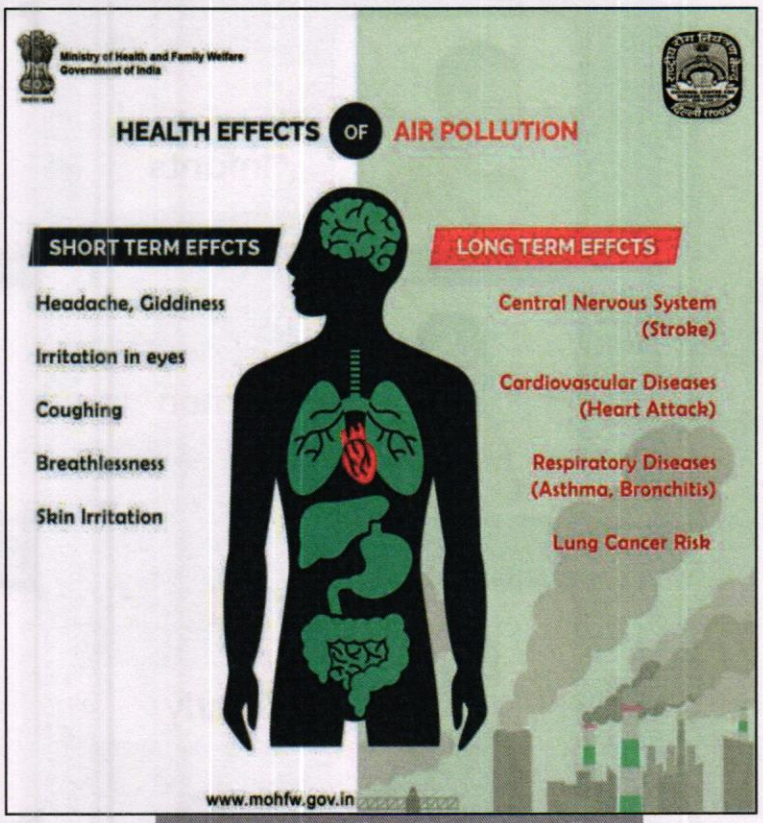

Figure 1 Health Effects due to Air pollution

i. Short-term high-level exposures can result in acute health reactions with involvement of various human organs and patients may present with certain suggestive symptoms like irritation of eyes, nose, throat and skin, cough, breathing difficulty, wheezing, chest discomfort, chest pain, headache, giddiness, limb weakness, facial deviation etc. Vulnerable groups can experience more severe effects such as lower respiratory tract inflammation and infection, exacerbation of asthma, bronchitis or exacerbation of chronic illnesses such as chronic obstructive pulmonary disease (Respiratory System), ischemic heart diseases (CVS), and cerebrovascular strokes (CNS) etc. Figure 1 (in the right) shows various health effects attributed due to air pollution.

ii. Long term exposure to even lower level of air pollution can result in chronic illnesses of respiratory and cardiovascular systems, lung cancer and premature deaths.

Vulnerable Population to health effects of air pollution:

i. **Age group:** Children particularly under 5 years and old age groups

ii. **Pregnant women:** Exposure during pregnancy may have consequences for child in womb.

iii. **Predisposed health conditions:** Those with pre-existing illnesses of respiratory cardiovascular and cerebrovascular systems are at higher risk

iv. **Low socio-economic conditions:** Those with poor nutritional status; those living in poor housing, using fossil fuels for cooking, heating/ lighting purposes are at risk.

v. **Outdoor working groups:** Those with possibility of prolonged exposures such as traffic policemen, traffic volunteers, construction workers, road sweepers, rickshaw pullers, auto-rickshaw drivers, roadside vendors, and others working outdoors in air polluted settings, labours working near boilers or furnace smelters, miners etc. are at higher risk.

vi. Besides, women with burning biomass for cooking, and sweeping dust are vulnerable on account of their household work.

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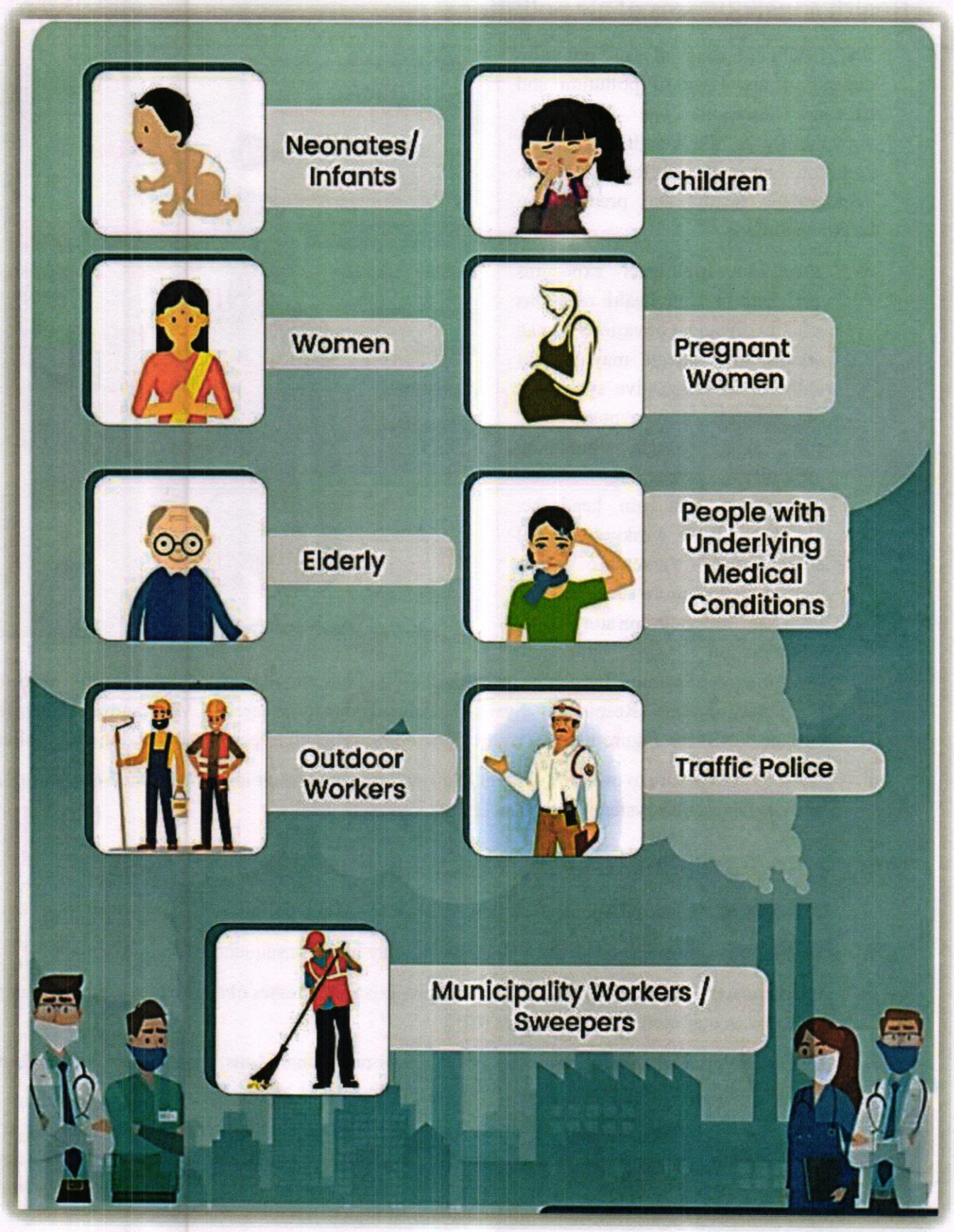

Figure 2. Vulnerable populations to Air Pollution exposure

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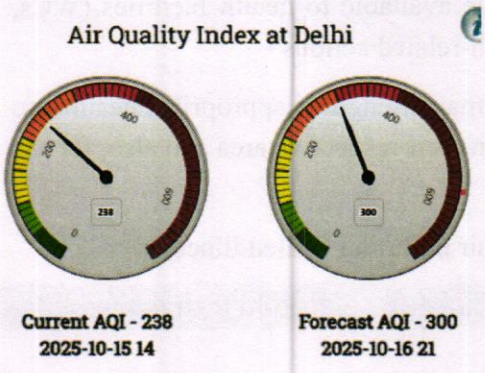
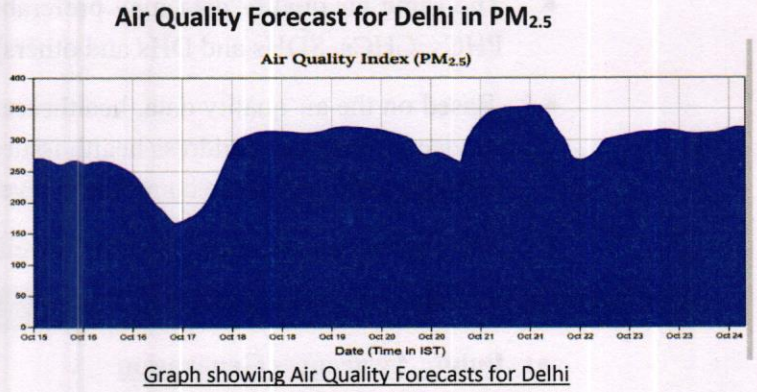
Air Quality Early Warning System (AQEWS) for Delhi and India (Advanced High Resolution)

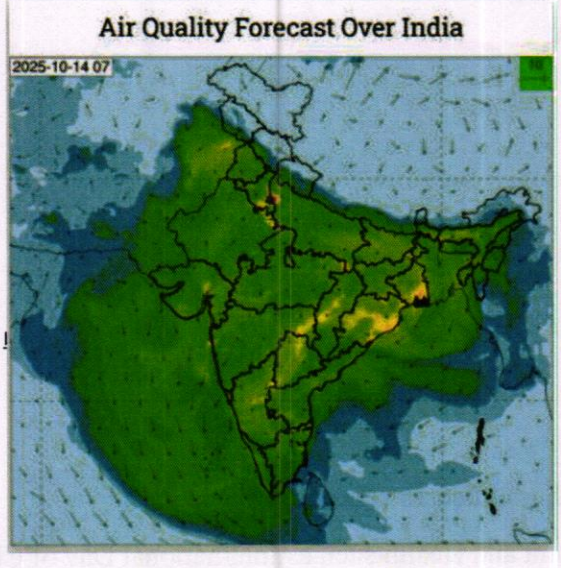
Under the auspices of Ministry of Earth Sciences, India Meteorological Department (IMD) and Indian Institute of Tropical Meteorology (IITM) have commissioned Air Quality Early Warning System (AQEWS) for India. The advanced high-resolution Air Quality Early Warning System is operational specifically for Delhi-NCR. It is also available for some specific Indian cities (Pune, Mumbai, Bengaluru, Kolkata, Varanasi, Lucknow, Kanpur, Ludhiana, Ahmedabad, Hyderabad, Visakhapatnam, Chennai, Coimbatore, Bhubaneswar, Ranchi, Patna, Raipur etc.). The final forecast is made available in terms of Air Quality Index (AQI) so that appropriate health advisories can be issued depending on severity of the pollution levels.





Graph showing Air Quality Forecasts for Delhi

The objective is: "to enable and provide air quality forecasting and information services in a harmonized and standardized way tailored to the needs of society and pollution control authorities". Climate and weather factors like wind, temperature, precipitation and other meteorological factors play a key role in the poor air quality that populations face.



How to access the Air Quality Forecast: The Air Quality forecast spatial plots are available for the Indian region. The air quality forecasts products are available at the following linkshttps://ews.tropmet.res.in and https://mausam.imd.gov.in .

State programme officials are to monitor the AQ forecasts regularly which are available for the respective areas at present. Depending on severity of the pollution levels in their respective areas, the officers are to take up appropriate health related actions including issuance of health advisory to increase the awareness level of the public on the Do's and Don'ts IEC messages in the social media and other media channels. These are the acts required to protect, prevent and control the health issues which may arise when people are exposed to air pollution.

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Recommendations to the States (main action points)-

NPCCHH programme Nodal Officers at State and District levels to supervise, monitor and coordinate the activities:

Getting Air Quality information in Health Sector:

State health authorities to keep a check on the daily air quality data in the cities particularly NCAP cities and these are available at CPCB website or State Pollution Control Board. As mentioned above, Sameer App. can also be used for obtaining information.

- State may coordinate with pollution control board for developing a system of availing such air quality information in health sector regularly.
- The same air quality data may preferably be made available to health facilities (WCs, PHCs, CHCs, SDHs and DHs and others) for health-related actions
- Based on the air quality data, healthcare facilities may strengthen appropriate healthcare service provisions to address health issues arising in their respective area and also, for the outreach activities at the community level.
- This information is also for use in surveillance on air pollution related illnesses

Strengthening of Healthcare services to address the air pollution related health issues

a) **Public Awareness Generation**

IEC materials

- Posters, GIFs, Audio-Video Spots, Social media messages (Prototypes at NCDC website)
- Locally translated/created IEC materials
- IEC messages (Annexure I)
- Social Media Messages (Annexure II)

IEC dissemination plans

- Timing: For example-
  - Winter months (Sept.-Oct to Feb.-March)
  - Pre and Post Diwali
  - Stubble Burning Days
  - SMOG (Smoke + Fog)- Fog admix with polluted air (Hazardous to health)
  - International Days related to Environment and Health such as International Day of Clean Air for blue skies (7th September) every year
- Channels for disseminations-
  - Social media - Twitter, Facebook, Instagram, You Tube, WhatsApp
  - Posters, Wall paintings, Street plays/Nukkad Natak
  - Radio Television channels (AIR, Door Darshan, FM channels)
  - Public means of transport vehicles- Bus etc.

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- Competitions (Painting, Quiz, Debates, Symposium)
- Key Public Officials and Senior officials
- Experts and Panel discussion

b) **Capacity building of the health sector** including healthcare facilities –

- Development of an action plan in health sector (District level, city level etc.)
- Training calendar- Programme officials, Surveillance Nodal officers, Community level workers etc.
- Training modules development and its conduction of the ToTs, Programme officials, MOs, Paramedics, CHOs, Community Health Workers, Surveillance Nodal Officers etc.

c) **Surveillance Strengthening and Monitoring in the State:** NPCCHH programme officials at the State (SNO-CC) and District (DNO-CC) roles are –

- To establish and expand sentinel surveillance on air pollution related illnesses in the state particularly NCAP cities.
- To establish sentinel hospitals for surveillance and identify hospital nodal officers
- Each sentinel hospital to report regarding daily air pollution related illness cases attending the emergency department to DNO-CC regularly/ timely.
- Each DNO to monitor reports from sentinel sites; analyse statistics of illnesses related to air pollution and share to the State and Central level for timely actions.

(Details in the SOP of Surveillance on air pollution related illnesses is available at NPCCHH website)

d) **Health sector response mechanisms - Healthcare facilities strengthening**

- Doctors/Staffs orientation on the issues, strengthening support to manage cases attributed to air pollution
- Patient care service areas
  - OPD services (mainly General OPDs, Medicine, Paediatrics, Respiratory Medicine, Cardiology and Neurology etc.)
  - Emergency services and Referral Services
  - Ambulance services
  - Outreach services
- Medications availability- acute respiratory/ cardiovascular/ cerebrovascular etc.
- Diagnostic/Laboratory Services
- Medical equipment's like oxygen supply, nebulizers, ventilators
- Hospital beds, Stretchers, Wheelchairs, Ambulances
- Referral mechanisms

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Provision of services for Air Pollution-Related Cardio-Pulmonary Illness through the special CHEST Clinic

The purpose of the CHEST clinic is:

- **Screening and risk communication** for air pollution-related cardio-pulmonary diseases
- Among patients already suffering from cardio-pulmonary illnesses- **establish possible causes (including Air Pollution) and confirm diagnosis**
- **Provide standard care** to patients suffering from cardio-pulmonary illnesses
- **Promote behaviour change and adoption of healthy practices** to potential and diagnosed cases of air pollution-related cardio-pulmonary illnesses

A) Setting up a CHEST Clinic

CHEST Clinic may be established at CHC, SDH (Subject to the availability of specialists), District hospitals, and Medical Colleges in urban areas, covering all such facilities in NCAP cities initially. (Reference: Pollution Control Board data).

During the peak air pollution months (usually from September to March), the clinics are expected to function for a fixed duration of at least two hours daily.

B) Screening of patients for risk factors

The staff nurse posted in the clinic would also be responsible for screening the patients to ascertain risk factors using a standard proforma. A register of individuals identified as being at high risk is to be maintained, and details of the high-risk individuals may also be shared with the respective blocks for community-based follow-up through ASHA, ANM, and CHO.

C) Confirmation of diagnosis and provision of care

Based on the clinical evaluation (including history, examination, and evaluation), a diagnosis may be arrived at and recorded utilising ICD Code in the CHEST Clinic register. Provision of standard care may be initiated on an outpatient basis or in the casualty/emergency/ward/ICU as per need. The Standard Treatment workflow for Pulmonology by ICMR (2019) may be used for the same.

D) Follow-up and continuum of care

The patient and at-risk individuals may be linked to their respective HWC, PHC, and CHC for continuation of medications and follow-up. For stable patients, a follow-up at the CHEST Clinic may be scheduled once a quarter or once in six months, as decided by the treating physician.

E) Record maintenance and reporting

All the aforementioned formats need to be maintained by the Staff nurse under the overall supervision of the Chest Physician/Physician/GDMO. A summary of the collated data can be collected through State/national-level digital tools, such as IHIP.

F) Linkage with other programmes/services

The CHEST clinic can be combined with the NCD Clinic, operated under the NP-NCD. In the presence of specific risk factors, bi-directional referral is encouraged between the CHEST Clinic, Tobacco Cessation clinics, and the TB Unit.

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Health Sector Response Action Plans

During high level of air pollution (particularly post-Diwali, Stubble burning and Winter days/ months (SMOG) in State/ District/ City)

Certain considerations (7 points) for Health Sector Responses –

- Health Department to activate the action plan during higher AQI levels
- Health Department may increase to coordinate with concerned departments for IEC Campaigns (Environment, Pollution Board, Transport, Urban development, Coal, Power, PWD (construction related works), Municipality/ Panchayat, Traffic Department, WCD, Labour department etc.)
- Health Departments including healthcare facilities to strictly monitor daily AQI levels during such high air pollution days/ months as reported from pollution control boards. Health Facilities may provide daily AQI value to inform people and measures to protect, prevent and control themselves from air pollution.
- Strengthening further public awareness campaigns in health sector (increasing frequency/ channels of dissemination to reach the target populations who are likely to have more health issues due to exposure to air pollution - School children, College students, Elderly, Women, Patients with underlying medical conditions of respiratory, cardiovascular, cerebrovascular diseases, outdoor exposures; vulnerable hot spot areas).
- Strengthening of healthcare services provisions- Patient care services at the Emergency departments; Outdoor departments etc.; Availability of medications/ equipment's in the ED/ OPDs to treat the illnesses; Human resources to attend patient care in departments; Logistics; Enhancement of beds if required in (ED). These may be appropriately taken up at different levels of healthcare facilities at WCs, PHCs, CHCs, SDHs, DHs and others tertiary cares
- Strict Monitoring of the sentinel surveillance reports; types of increasing cases reporting in the health care facilities (Respiratory cases, Cardiovascular, cerebrovascular cases). This information to share with concerned departments and Hospitals/ Healthcare Facilities for actions to take.
- Engagements of Civil Societies/ Private facilities to support in addressing the issue.

Health Adaptation Plan on air pollution and health (State/ District level):

- State/ Districts to finalize action plan to address on air pollution related illnesses
- State and District Task Force on Climate Change and Health may coordinate with concerned departments to finalize action plan on air pollution related illnesses
- The Health Action Plan for state/ district/ cities may include actions to achieve programme objectives
- Air pollution issues in the State including non-attainment cities identified
  - Name of the non-attainment cities
  - System to avail daily air quality data in health sector from pollution control board and sharing the same with the healthcare facilities
- Awareness Generation and its dissemination planning (IECs, public health advisories, translated IECs, dissemination channels and areas identified)

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- Capacity building activities (Modules and Training of DNO-CCs, Medical Officers, Paramedics, Community level health workers) –at HCFs in the State
- Surveillance strengthening on air pollution related illnesses (cities, hospitals, nodal officers, training, surveillance data, its analysis and actions
- Health-sector preparedness and response action plans
- Details of Roles/ Responsibilities of healthcare personnel
- Inter-sectoral coordination mechanisms (Health and Non-Health)

Health sector's response in context of CPCB's "Graded Response Action Plan"

In view of the serious concern and urgent action requirements to address the high level of air pollution in Delhi & NCR, a Graded Response Action Plan and appropriate measures based on air pollution levels was notified in 2017 under the MoEFCC. It has an added new category of "Severe+ or Emergency" in the previous 6 AQI categories. It defined various mitigating and adapting activities as graded response actions to address the higher level of air pollution and identified the respective implementing agencies from concerned Ministries and Departments. Its detail is available at *https://cpcb.nic.in/uploads/final_graded_table.pdf*

Health sector in Delhi NCR region (Delhi, Haryana, Punjab, Rajasthan and Uttar Pradesh) may do -

i. State NPCCHH programme officials may coordinate with implementing agencies as mentioned in the action plan for the purpose of awareness generation of health issues associated with air pollution among the people.

ii. These concerned departments may be considered as members for State/ District level Task Force under NPCCHH programme for taking support/ inter-sectoral coordination in addressing the issues in the State/Districts of these regions.

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Annexure I: IEC messages for Public Awareness on Air Pollution and Health Concerns under NPCCHH

Target Population-

- General population and
- Vulnerable groups such as children, elderly and those with underlying medical conditions
- Optional interventional choices

I. General Population:

Reduce risk from exposure to air pollutants by taking up the following measures –

Avoid preferably places with high air pollution like roads with slow & heavy traffic, areas near polluting industries, construction-demolition sites.

1. Avoid outdoor morning and late evening walk, run, jog and physical exercise. Do not open external doors and windows during morning and late evening hours, it may ventilate if necessary, between 12 p.m. to 4 p.m. in afternoon (Days with poor to severe AQI)
2. Avoid burning biomass such as wood, coal, animal dung, kerosene. Use clean smokeless fuels (gas or electricity) for cooking and heating purposes. If using biomass, use clean cook stoves.
3. Avoid burning of wood/ charcoal in 'Anghiti' during winters, in closed and confined condition which may be fatal due to CO and built-up CO_2
4. Avoid use of room fresheners, it has ill effects as it consume O_2 in vicinity very fast.
5. Avoid burning firecrackers.
6. Avoid burning in open any form of wood, leaves, crop residues, & waste.
7. Do not smoke cigarettes, bidis and related tobacco products.
8. Avoid burning mosquito coils and incense sticks in closed premises.
9. Reschedule outdoor activities as per AQI, and remain indoors on days with poor to severe AQI.
10. Practice wet mopping instead of sweeping or vacuum cleaning inside homes. If you choose to use vacuum cleaner, use those having High Efficiency Particulate Air (HEPA) filter
11. Keep washing your eyes with running water regularly and do regular gargles with warm water
12. Consult the nearest doctor in case of breathlessness, giddiness, cough, chest discomfort or pain, irritation in eyes (red or watery)
13. As a "no-regret" strategy, healthy diet, with fruit and vegetables rich in antioxidants, and adequate amount of hydration by drinking water is advocated.

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II. **Those with underlying medical conditions particularly chronic pulmonary or cardiovascular problems** should have following additional measures

1. Be more careful to avoid exposure to air pollution
2. Avoid any strenuous activity and stay indoor during higher AQI levels
3. Keep a check on exacerbations of suggestive symptoms
4. Properly follow doctor's instructions on healthcare
5. Keep the prescribed medications readily available
6. Seek immediate medical advice if symptoms worsen.

III. Optional choices (**Face Mask, Air Purifiers, Air Conditioners**)

1. If you choose to use face mask, the disposable N95 or N99 is useful provided user instructions are followed. These masks may help provided the period of exposure is short. Masks should have proper fitting on users' mouth and nose. Ensure to replace the masks after usage as instructed. Paper masks, handkerchiefs, scarves and cloth are not effective.
2. If you choose to use air purifier, follow manufacturers' guidelines, however it may be advised to have expert's consultation on suitability, positioning, technology selection and cleaning capacity (area coverage). Ensure to replace and clean filters as instructed. Avoid using an air purifier that works by generating ozone, as it increases pollution inside rooms.
3. When operating air conditioners in buildings or vehicle, use in "re-circulate" mode to avoid contact with outside air.

IV. IEC materials (Posters, GIFs, Audio Spots and Video Spots) are available at NCDC website

1. Link to find them- https://ncdc.mohfw.gov.in/centre-for-environmental-occupational-health-climate-change-health/

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Annexure II: Social Media Messages under NPCCHH

1. Check the daily Air Quality Index (AQI) of your area before planning your day out.
2. Avoid places with high air pollution like roads with slow & heavy traffic areas near polluting areas to minimize exposure to air pollution.
3. Avoid construction-demolition sites, coal-based power plants, brick kilns etc. to minimize exposure to air pollution
4. On days of poor to severe plus air pollution (AQI>200)
    a) avoid outdoor morning & late evening walk
    b) avoid jogging, running or other exertional physical activities
    c) avoid opening external doors and windows during morning and late evening hours.
    d) ventilate rooms, if necessary, between 12 p.m. to 4 p.m. in afternoon
    e) remains indoors, and reschedule outdoor activities as per AQI levels
    f) if person experiences breathlessness, cough, chest discomfort or pain, giddiness, irritation in eyes (red or watery) – consult the nearest doctor immediately.
    g) high risk people like pregnant women, young children and elderly should restrict outdoor movements as far as possible.
5. Avoid burning in the open environment of any form of wood, leaves, crop residues, and waste which can further worsen air pollution
6. Practice wet mopping instead of sweeping or vacuum inside homes to reduce exposure to air pollution.
7. Avoid burning firecrackers
8. To reduce the harmful effects of air pollution, eat seasonal fruits and vegetables rich in antioxidants and drink adequate water to maintain hydration.
9. Patients with chronic pulmonary or cardiovascular problems, pregnant women, young children and elderly people should be more careful and avoid exposure to air pollution.
10. On days of poor to severe plus air pollution avoid any strenuous activity by persons with chronic cardio-pulmonary disease.

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11. Patients with chronic pulmonary and cardio vascular disease should keep their prescribed medicines readily available while going outdoors on poor to severe plus air pollution days (AQI>200).
12. Patients with chronic pulmonary and cardio vascular disease should keep a check on exacerbation of symptoms on poor to severe plus air pollution days (AQI>200).
13. Patients with chronic pulmonary and cardio vascular disease could seek immediate medical advice if symptoms worsen during poor to severe plus air pollution days (AQI>200).
14. On days of poor to severe plus air pollution (AQI>200) consider use of close fitted N95 orN99 masks to reduce exposure to air pollution.
15. On days of poor to severe plus air pollution (AQI>200) use of air purifiers may be beneficial to reduce the effects of air pollution.
16. Avoid uses of air purifiers that works by generating ozone and other harmful byproducts as they increase indoor air pollution.
17. Air conditioners in buildings and vehicles may use "re-circulate" mode to avoid contact with outside polluted air on days of poor to severe plus air pollution (AQI>200).
18. Stop smoking cigarettes, bidis and other related tobacco products which aggravate ill effects of air pollution.
19. When the air pollution level is poor to severe plus (AQI>200), drive the vehicle with windows closed to minimize exposure to air pollution.
20. Use public transport whenever possible to reduce air pollution.
21. When the air pollution level is poor to severe plus (AQI>200), if someone experiences cough, wheezing, chest tightness – level of exertional activity should be decreased or stopped and immediately consult to nearest doctor.
22. Follow local air quality forecasts before planning to outdoor activity.
23. Ensure cooking areas are well ventilated with cross ventilation by opening windows, doors to reduce exposure to household air pollution.
24. Avoid burning mosquito coils and incense sticks in closed premises to reduce exposure to indoor air pollution.
25. Avoid spending long periods of time in busy routes in poor to severe plus air pollution days.
26. Avoid exercising near high traffic areas where exposure to air pollution is usually high.
27. Act in time, protect yourself from ill effects of air pollution.

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28. Pollution due to fire-cracker burning can seriously impact health of person's suffering from cardiovascular, respiratory diseases.
29. Avoid fire-crackers burning especially by people suffering from asthma or another lung disease.
30. Stay indoor during nights of Diwali to reduce exposure to air pollution.
31. Wear a mask (N95 or N99) to reduce exposure to air pollution by fire-crackers.
32. If a person develops breathing difficulty during Diwali, consult to doctor immediately.
33. When complete escape from air pollution is difficult, taking some measures can provide you a certain level of protection from its harmful effects on your health.
34. Increased air pollution level can have major health consequences. Do check the AQI before planning your outdoor activities for the day. Website to check AQI: CPCB
35. It makes such a difference to live in a green and healthy city! Become aware & Act now
36. Vulnerable population are the highest risk of their health being affected due to Air Pollution. These vulnerable groups should avoid outdoor physical activities when Air Quality is poor to severe.
37. Choose green to breathe clean: Planting more trees can reduce the effect of air pollution on health. Head towards a pollution free tomorrow with every tree you plant.

Note please: Hash tags may be considered to coordinate with relevant Ministries/ departments/ Institutes/ Organizations like Central/ State Pollution Control Board, Environment, NPCCHH Programme etc.

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Annexure III: Health Advisory for household air pollution

1. To minimise pollution by mitigating or reducing from sources -

i. Cooking with solid fuels like firewood, cow dungs, coal and kerosene etc.
ii. Heating purposes during colder or winter days from solid fossil fuels
iii. Lighting purposes from kerosene lamps etc.
iv. Smoke from mosquito coils or incense sticks during poor air quality days
v. Smoking of cigarettes, bidis, traditional hookah etc.
vi. Outside pollution sources - nearby construction sites, and materials like paints, and composite wood products; vehicular exhausts in houses nearby the roads
vii. Burning of wastes, crop residues, plastics, bottles and food wrappers etc.

2. Adoption of better practices while cooking in Kitchen or at homes

i. Use of cleaner fuels (LPG, electronic based)
ii. To ventilate air adequately to reduce smoke properly during cooking (opening windows or doors; use of exhausts fan)
iii. Avoid to burn fossil fuels and if to do, use open spaces or small pieces of wood
iv. To minimise cooking hours by prior soaking of foods if possible
v. During poor air quality level, to avoid cooking causing smoke or to shift timing if possible
vi. To take breaks for clean air while cooking if possible
vii. To cover pots and bottom cleansed for faster cooking and efficiency
viii. Women to make elderly, children stay away from polluting sources

3. Considerations in other household areas and vicinity during polluted air levels

i. To use energy efficient measures like LED bulbs or other electronic devices at homes
ii. To ventilate properly by opening doors/ windows wherever possible; restrict if air quality is poor
iii. Avoid burning fossil fuels having smoke inside houses for heating and lighting purposes
iv. Restrict sweeping causing dust particles in air; timings may change to afternoon
v. Use damp sweeping/ clothes for cleaning floors and surfaces
vi. Avoid havan indoor when air quality level is poor
vii. Reduce air fresheners, sprays and mosquito coils and sprays if poor air quality
viii. Do not burn crop residue or wastes causing smoke
ix. Discourage visitors/ family members from smoking tobacco/ hookah indoor or vicinity

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Annexure IV: Health Advisory on air pollution for School Children

1. School health authorities, head, teachers and parents to develop mechanisms to create awareness and motivate in adopting better practices among students to mitigate and adapt on air pollution.
2. Children to be awarded by organising activities and events on air pollution at school level -
    i) Areas- Cities and urban areas are more likely for outside pollution levels
    ii) Season/ days- Colder winter seasons/ days in cities/ urban; Diwali/ Dust storm
    iii) Timings- Morning and evening hours if SMOG is prevailing and sunlight not visible
    iv) Sites for precautions - transit from home to school, near school gates, and outdooring
    v) Younger children, respiratory health issues, medically underlying conditions are more vulnerable and to take more precautionary measures from risk exposure/ attacks
3. Adoption of vehicles for school (cars, vans, school buses) to reduce emissions/ air pollution
    i) School buses (to encourage)
    ii) Public transport (to encourage)
    iii) To adopt cleaner fuels like CNGs
    iv) Car-pooling (to encourage)
    v) Electric cars
    vi) To adopt use of bicycles by bigger children appropriately
4. To minimise exposure to air pollution among school children -
    i) Shorter school distance to prefer
    ii) To stay away from polluted sources like vehicular exhausts during transit to school or dusty environments at school by covering nose with cloth or mask
    iii) Ensure proper classroom ventilation by opening windows properly or installing exhaust fans
    iv) To close windows if air quality level is poor and above
    v) To adopt wet mopping for floor cleaning in school or before students arrive to school
    vi) Marker pens may be used for writing on board instead of chalks.
5. Precautions and avoidance of outdoor activities in school if AQI levels is poor and above
    i) To display, if possible, to students/ teachers of AQI levels and alert
    ii) Schools to limit outdoor activities during days of higher pollution levels
    iii) During break sessions, stay indoors and minimize outdoor exposure
    iv) Physical activities like running, jogging, playing may be avoided or postponed
    v) School activities, functions, celebrations and even birthday celebrations if possible
6. Medical officials/ staffs at school to sensitise on air pollution related health issues and ways to manage such cases for support also from nearby emergency health facilities if required.

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Annexure V: Advisory for construction and demolition workers

The construction and demolition activities cause the air pollution in following ways:

- **Dust emission:** The operation of machinery, demolition activities, and the loading and unloading of goods emit suspended particulate matter (PM10, PM2.5, and PM1) that pose health concerns upon inhalation.
- **Emissions from machines:** Construction machinery, such as bulldozers, trucks, and generators, usually run on diesel fuel. These emit pollutants like nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), and fine particulate matter.
- **Transportation of construction material:** The management of construction materials significantly intensifies pollution levels, particularly particle matter that can cause serious health problems. The larger heavier particles settle out of the air quickly and are hazardous to the operators of plant and equipment (on-site) and to those in the immediate vicinity (off-site). The finer small particles (usually invisible) are transported further causing health hazards (off-site).

The impact of air pollution at construction site can be minimized upon following preventive measures:

1. **Suggestive measures/practices for employer to strengthen the workforce**[1]
   i) Sensitization of workers (skilled or unskilled labour) on health, safety and environmental protection.
   ii) Training of all workers on the potential health risks associated with air pollution, air quality index (AQI), expected hazards of air pollution due to prolonged exposure.
   iii) Training of workers operating a motor vehicle on the job (on or off premises) on vehicle maintenance to ensure operation of vehicle within emission norms and minimize air pollution.
   iv) Awareness program for workers on implementation of emergency preparedness plan based on Disaster Management Plan. This will ensure workers are prepared to respond to emergencies effectively.
   v) Training on the correct selection, use, and maintenance of Personal Protective Equipment (PPE) is essential. Workers should be equipped with appropriate PPE, such as face masks and respirators, to protect themselves from airborne pollutants and other site-specific hazards.

[1]Safety Manual for Construction Workers, Labour Department, Directorate of Industrial Safety and Health

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vi) Training of workers and staff on the identification of health issues or respiratory problems (such as coughing and dyspnoea). Prompt medical attention should be encouraged for any workers showing signs of respiratory distress.

vii) Conduct regular health check-ups at the construction site to monitor lung function using spirometer/peak flow meter. This will help identify any early signs of respiratory or other pollution-related health issues.

viii) The workers need to be shifted/rotated in different job operations or different tasks to minimize extended exposure to high-dust environments.

ix) Provide regular breaks depending upon the assigned task for workers to reduce the harmful impact of air pollution on health.

2. Adoption of better behavioural practices for construction workers[2]

i) Use the dust masks or personal protection provided by the management to safeguard against the inhalation of fine particulate matter (PM2.5), dust, and odours. In the absence of PPE, cloth mask or bandana may be used to cover nose and mouth when working in dusty conditions.

ii) Workers shall wear long-sleeved shirts and full-length trousers to minimize skin exposure to dust.

iii) All workers are advised to consistently use safety goggles to protect their eyes from irritation caused by dust, debris, and exposure to chemicals.

iv) Gloves and coveralls must be worn to prevent direct contact with hazardous materials like asbestos, concrete dust, and chemicals. Proper protective clothing helps protect the skin from irritation and minimizes the risk of exposure to toxic substances.

v) Workers should maintain personal hygiene including regular hand and face wash with clean water, especially before eating, changing outer layer of clothing before going home and bath or shower after work to remove dust from your skin and hair.

vi) Workers are advised to ensure adequate water intake to facilitate toxin elimination and support overall health, as dehydration can exacerbate the effects of pollution (at least 2 litres).

vii) Food intake should include balanced diet including fruits, local vegetables, cereals, pulses and milk products, which provide all nutrients in adequate proportion[3]. The spices like turmeric, cumin, coriander, and ginger have antioxidant and anti-inflammatory properties

2Proceedings of 186 meeting of SEAC held on 26.12.2019

[3]https://www.nin.res.in/downloads/DietaryGuidelinesforNINwebsite.pdf

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that help in counteracting the effects of pollution[4], and jaggery provide iron and other minerals that help in detoxifying the body[5].

viii) Workers are advised to pay attention to the symptoms like persistent coughing, wheezing, or difficulty in breathing and seek medical attention if these symptoms persist or worsen.

3. Development of better operational practices for construction workers[6],[7]

i) Regular use of water sprinkling or fine sprays from nozzles should be adopted to suppress dust at the site, preventing its resuspension into the air.

ii) Construction & Demolition wastes or construction material whether stored or transported (Lorries / tractors) to be preferably covered.

iii) Areas where loading / unloading (fugitive dust) activities should be demarcated and located in areas where dust dispersal can be minimized.

iv) Equipment such as conveyor belts, crushers, and other machinery used on site that generates dust should be operated with water sprinklers to minimize emissions.

v) Conduct regular maintenance check of Gensets (DG sets) to ensure low emissions.

vi) All vehicles used for transporting materials should be well-maintained and comply with Pollution Under Control (PUC) certifications to ensure minimal emissions.

vii) Dry sweeping of work areas to be prohibited.

viii) Transport & stored material that are easily carried by the wind need to be covered by a sheet made of either jute, tarpaulin, plastic or any other effective material.

ix) The paints, solvents, and other hazardous substances are needed to be securely stored in sealed containers to prevent vapor emission.

x) The intensive activities that cause significant pollution such as demolition and excavation should be avoided during elevated pollution levels (e.g., early mornings or late afternoons in urban areas with significant traffic pollution).

xi) The air quality required to be monitored regularly to detect pollutant concentrations and initiate measures when levels surpass safety limits.

xii) Provisions should be available for any medical assistance including investigations, and treatment for workers involved in construction activities, handling materials and debris associated with dust emissions.

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[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5618098/

[5] https://www.sciencedirect.com/science/article/abs/pii/B9780128169186000160

[6] Guidelines on dust mitigation measures in handing construction material and Construction & demolition waste

[7] Graded Response Action Plan (see - http://cpcb.nic.in/final_graded_table.pdf)

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ANNEXURE VI: Chest Clinic

I. Risk Assessment for Air Pollution-Related Cardio-pulmonary Illnesses:

Name of Individual/Patient: _____ Gender: Male/Female Age:
Address: _____ Block: _____
Phone Number: _____

	Habit of Smoking	o Never o In the past o Sometimes o Daily o Second Hand
	Type of Fuel is used for cooking/heating	o Firewood o Crop Residue o Cow Dung Cake o Coal o Kerosene o LPG o Electric o Solar
	Indoor pollutants (incense, mosquito coils) used in the home/school/workplace?	o Yes o No
	Lack of proper ventilation at place of residence/study/work	o Yes o No
	Occupational Exposure	o Crop Residue burning o Mining/Smelter o Burning of Garbage- leaves o Traffic Police o Brick kiln workers o Glass factory worker o Construction workers o Manufacturing
	Exposure at the place of residence/study or at work due to	o Affected By Forest Fires o Has Frequent Dust Storms o Has Thermal Power Plants o Heavy Industries o Landfills o Unpaved Roads/Major Road/Highway o Known For Poor Air Quality Or Frequent Smog
	Family history of Cardio-pulmonary conditions in the family	o Yes o No
	Protective behaviours 1. Do you monitor/follow updates on Air quality through an app/website 2. Do you avoid outdoor activities during poor air quality 3. Do you use N95 or equivalent masks during high pollution periods	o Yes/ No o Yes/ No o Yes/ No

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II. CHEST clinic Format 1- Line list of individuals accessing services

Name of the Hospital: Date:

Block: District: State:

Name of Staff Nurse: Name of Duty Doctor:

Sl. No	Name of Individual/Patient and Phone #	Age	Gender	Village	Block	Risk Factor (Yes/No), If yes- Mention code	Diagnosis if symptomatic

III. CHEST Clinic Format 2- Summary reporting (Daily)

Name of the Hospital: Date:

Type of Facility: CHC/SDH/DH/Medical College/Others (Specify):

Block: District: State:

Name of Staff Nurse: Name of Duty Doctor:

	Paediatric		Adult	
	M	F	M	F
No. of persons screened during the day:				
Cumulative no. of persons screened:				
No. of persons with exposure to Air Pollution:				
Cumulative no. of persons with exposure to Air Pollution				
No. of persons provided risk-based counselling to reduce exposure				
Cumulative no. of persons provided risk-based counselling:				
No. of new cardio-pulmonary illnesses diagnosed during the day				
No. of new cases put on treatment				
Cumulative no. of cardio-pulmonary illnesses diagnosed				
Cumulative no. of cases put on treatment				
No. of cases on follow-up for Standard of Care (As of date)				
No. of patients for refill of drugs (As of date)				
Cumulative no. of patients lost to follow-up				

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ICD Code for various Cardio-pulmonary Conditions

Condition	ICD Code
Asymptomatic case with Contact with and (suspected) exposure to air pollution	Z77.110
Symptomatic with suspected or confirmed Exposure to air pollution	Z58.1
Acute respiratory infections or exacerbations	J06
Acute lower respiratory tract infections	J22
Acute exacerbation of Asthma	J45
Acute infections of Influenza	J10
Pneumonia (Viral/Bacterial)	J18
Acute on Chronic respiratory diseases	J44
Acute Exacerbation of Obstructive Lung Disease and Bronchiectasis	J47
Acute respiratory distress syndrome (ARDS)	J80
Allergic Rhinitis	J30
Chronic Obstructive Pulmonary Disease (COPD)	J44
Lung Cancer	C34
Pulmonary Tuberculosis (PTB)	A15
Lower Respiratory Tract Infections (Pneumonia)	J18
Interstitial Lung Disease (ILD)	J84
Pneumoconiosis due to various dusts (asbestos, silica, talc, etc.)	J60-J64
Airway disease due to specific organic dusts (byssinosis, flax-dresser's disease, etc.).	J66
Hypersensitivity pneumonitis due to organic dusts	J67
Respiratory conditions due to inhalation of chemicals, gases, fumes, and vapors (bronchitis, pneumonitis, pulmonary edema, etc.).	J68
Angina pectoris	I20
Acute myocardial infarction	I21
Chronic ischemic heart disease	I25
Cerebral infarction (ischemic stroke)	I63
Essential (primary) hypertension	I10
Hypertensive heart and renal disease	I11–I13
Heart failure	I50
Paroxysmal tachycardia	I47
Atrial fibrillation and flutter	I48
Other cardiac arrhythmias	I49
Atherosclerosis of arteries	I70
Pulmonary Heart Diseases	I27

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References and links to access information and documents on air pollution and those related to air pollution health issues from NPCCHH programme, CPCB etc.-

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6. CPCB's **"Graded Response Action Plan"** for Delhi NCR on air pollution as- https://cpcb.nic.in/uploads/final_graded_table.pdf https://cpcb.nic.in/air-pollution/
7. https://www.who.int/health-topics/air-pollution#tab=tab_1

National Centre for Disease Control Government of India

NATIONAL HEALTH MISSION राष्ट्रीय स्वास्थ्य मिशन

National Programme on Climate Change and Human Health

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