

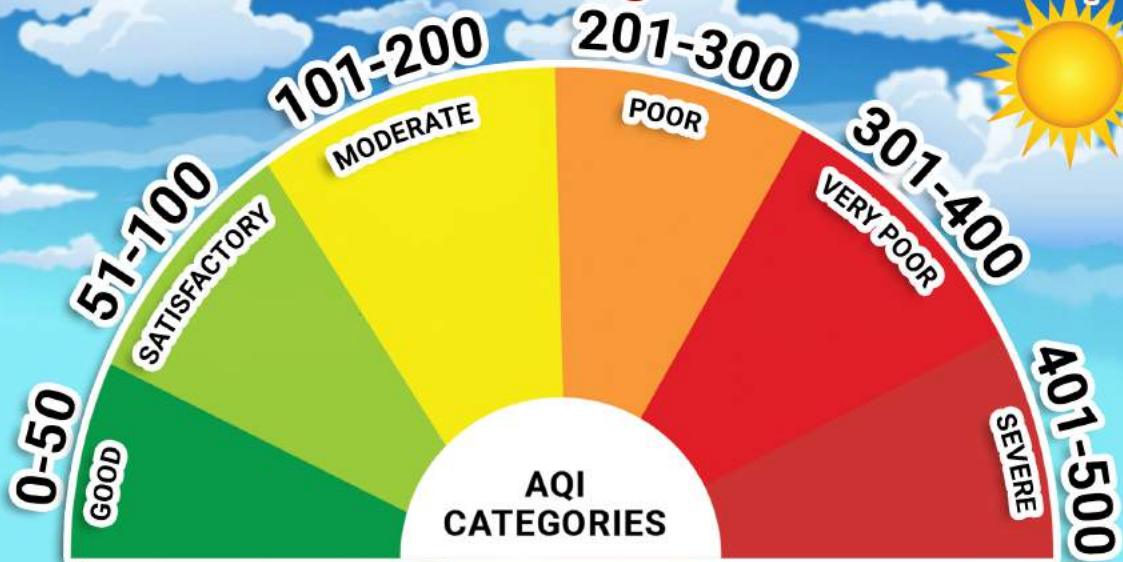


सत्यमेव जयते

Ministry of Health & Family Welfare

HEALTH SECTOR PREPAREDNESS FOR AIR POLLUTION

Minimizing the Health Impact



CIVIL HOSPITAL

HEALTH & WELLNESS CENTRE



Ministry of Health & Family Welfare
Government of India
2021



ACKNOWLEDGEMENT

Air pollution is recognized as an important environmental risk factor to human health and also, an avoidable cause of death and disability. It disproportionately affects the people's health, particularly to the children, women, the elderly, and those who are economically disadvantaged and the marginalized groups of people in the country.

The NPCCHH programme under the MoHFW along with the PGIMER and Panjab University have developed this '**Health Sector Preparedness for Air pollution**' booklet. This infographic booklet will provide guidance to the programme officers under the NPCCHH programme to help strengthen the preparedness on health responses to issues arising due to air pollution in the State/UTs. It will also make the concepts easily clear while understanding the health-related issues and implementation of the mitigation measures in the health sector.

The booklet was supervised and monitored under the guidance of Lav Agarwal, Joint Secretary, MoHFW. The NPCCHH programme division at NCDC undertook the task under Dr Sujeet K. Singh, Director NCDC and the full support and supervision to the NPCCHH team working on the document.

The NPCCHH programme highly acknowledges the efforts and contributions from the Post Graduate Institute of Medical Educational Research (PGIMER), a designated '**Centre of Excellence on Air Pollution related illness**' under the National Programme on Climate Change and Human Health. The programme sincerely acknowledges Dr. Ravindra Khaiwal, Additional Professor from the PGIMER, Chandigarh, who is the nodal officer of the above climate-sensitive disease and Dr. Suman Mor from Panjab University, also a nodal officer of 'Institute of Repute - NCAP' under the Ministry of Environment, Forest, and Climate Change in conceptualizing, designing and developing the present handbook.

It is highly commended to all efforts of those who were involved in making this infographic booklet a much valuable handbook of an urgent need to tackle the air pollution-related matters in the present times.

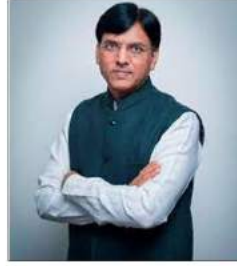
NPCCHH Team



मनसुख मांडविया
MANSUKH MANDAVIYA



सत्यमेव जयते



स्वास्थ्य एवं परिवार कल्याण
व रासायन एवं उर्वरक मंत्री
भारत सरकार

Ministry of Health and Family Welfare
and Chemical & Fertilizers
Government of India

Message

We are aware that air pollution is one of the most challenging environmental threat to human health in current time. It causes an increasing morbidity and mortality among the people living in cities as well as in rural India. This adversely affects the health of children, elderly persons, women, poor and marginalized groups of population in the country. Strengthening health sector preparedness for air pollution is of prime importance in order to tackle the increasing health issues particularly affecting among these vulnerable groups of population.

The present booklet developed under the National Programme on Climate Change and Human Health (NPCCHH), MoHFW is the presentation of **health sector preparedness** for air pollution as infographics which shows the graphic visual representations of information on health sector preparedness to fight air pollution related problem.

This booklet will help in understanding the health sector response and preparedness to strengthen health care services in the States/UTs.

I congratulate all those who help in developing this infographic document on **health sector preparedness** to address the health concern for a better public health in the country.

(Mansukh Mandaviya)



डॉ. भारती प्रविण पवार
Dr. Bharati Pravin Pawar



सत्यमेव जयते

सर्वेसन्तु निरामया



स्वास्थ्य एवं परिवार कल्याण राज्य मंत्री
भारत सरकार

MINISTER OF STATE FOR
HEALTH & FAMILY WELFARE
GOVERNMENT OF INDIA



MESSAGE

Developing health sector preparedness for air pollution is one of the key objectives under the National Programme on Climate Change and Human Health (NPCCHH), MoHFW. This is due to the increasing health challenge faced by the people in the country living in the cities, urban and even in rural like the children, women, elderly and marginalized and poorer people etc.

Recently, a booklet or '**Health Sector Preparedness for Air pollution**' has been developed under the National Programme on Climate Change and Human Health (NPCCHH), MoHFW. It will give a clear and quick understanding through the brief graphic visual representations of information on health sector preparedness on air pollution and health. It contains briefly as infographics on the various health measures to undertake in the health sector like public health advisories, awareness generation measures, strengthening healthcare facilities and public engagement etc.

All stakeholders under the NPCCHH programme including state programme health officials and workers in the country can refer the major health action points in context of air pollution. This will surely help in protecting, preventing and managing of negative health problems arising against the people particularly the more vulnerable in the State.

I sincerely express my immense gratitude to all the NPCCHH programme team and the experts who develop this valuable infographic on health sector preparedness for air pollution to benefit the public health concern in the country.

(Dr. Bharati Pravin Pawar)

“दो गज की दूरी, मास्क है जरूरी”



राजेश भूषण, आईएएस
सचिव

RAJESH BHUSHAN, IAS
SECRETARY



भारत सरकार
स्वास्थ्य एवं परिवार कल्याण विभाग
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
Government of India
Department of Health and Family Welfare
Ministry of Health and Family Welfare



Message

Air pollution is a major environmental risk factor for morbidity and premature mortality worldwide and is known to affect disproportionately the health of the children, women and the elderly in the population. It is also found to be associated with a large proportion of health problems like respiratory and heart diseases, stroke etc. in both urban and rural India.

The National Programme on Climate Change and Human Health (NPCCHH) under the Ministry of Health and Family Welfare has recently come out with a booklet of infographics -- '**Health Sector Preparedness for Air pollution**' which will help in strengthening the various health measures available under the programme. The booklet will increase the awareness of the programme officers and workers at a glance on the measures of awareness generation, on understanding air quality level in an area and health sector responses and ways of community engagement.

I am sure this booklet of infographics will be very useful to supplement the health action plans in the States/UTs to minimize and control the health impact of air pollution and will also play a significant role in creating increased awareness on air pollution, its negative health impact and its various health adaptation measures.

My sincere thanks to the NPCCHH programme team and all the other experts for bringing out such a valuable infographics document on health sector preparedness for air pollution.

(Rajesh Bhushan)

प्रो.(डॉ.) सुनील कुमार

एम.बी.बी.एस एवं एम.एस.(एम्स)

PROF. (Dr.) SUNIL KUMAR
MBBS & MS (AIIMS)

स्वास्थ्य सेवा महानिदेशक

DIRECTOR GENERAL OF HEALTH SERVICES



सत्यमेव जयते

भारत सरकार
स्वास्थ्य एवं परिवार कल्याण मंत्रालय
स्वास्थ्य सेवा महानिदेशालय
Government of India
Ministry of Health & Family Welfare
Directorate General of Health Services



MESSAGE

Air pollution, the leading environmental risk factor for health, is known to affect disproportionately the health of the children, women and the elderly in the population. It is also found to be associated with a large proportion of health problems like respiratory and heart diseases, stroke and other NCD diseases etc. among the more vulnerable population in both the urban and rural India.

In order to help strengthen the health sector in addressing such health issues due to air pollution, the National Programme on Climate Change and Human Health (NPCCHH) under the Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare has successfully brought out an infographic on '**Health Sector Preparedness for Air pollution**'. The booklet will help at glance more clearly and easily in understanding to all the relevant stakeholders including programme officials on various health adaptation measures to deal with air pollution. The health sector including healthcare facilities role of awareness generation, on understanding air quality level in an area and its preparedness and responses and ways of community engagement are illustrated for more clarity in infographics sequentially.

I am very confident that this infographic booklet will supplement as an important tool in the States/UTs to help minimize and control the health impact of air pollution and to address its negative health impact with the health adaptation measures.

My utmost and sincere thanks to all those in the NPCCHH team and the professionals for successfully developing this infographic document on health sector preparedness for air pollution and to support in addressing such a priority public health concern in the country.


23/07/21
(Sunil Kumar)

HEALTH SECTOR PREPAREDNESS FOR AIR POLLUTION RELATED ILLNESS



**A BRIEF ON AIR POLLUTION & MITIGATION ACTIONS
IN INDIA**

1



UNDERSTANDING AIR QUALITY & AQI

2



HOW TO CHECK AQI OF YOUR CITY?

3



**MAJOR HEALTH ADAPTATION ACTION PLAN ON
AIR POLLUTION**

4



**MAJOR HEALTH ADAPTATION ACTION PLAN ON
AIR POLLUTION**

5



**AQI CATEGORIES & HEALTH ADVISORIES FOR
VULNERABLE POPULATIONS**

6



AQI & HEALTH SECTOR PREPAREDNESS

7



**HEALTH CARE FACILITIES PREPAREDNESS ON
AIR POLLUTION**

8



**WAYS TO INCREASE AWARENESS GENERATION ON
AIR POLLUTION & HEALTH**

9



**PROMOTION OF PUBLIC PARTICIPATION
& ENGAGEMENT : TO REDUCE AIR POLLUTION**

10

This booklet is based on current knowledge & may need to be updated with the emerging evidence.

A BRIEF ON AIR POLLUTION & MITIGATION ACTION IN INDIA

NATIONAL CLEAN AIR PROGRAM (NCAP)

Air pollution is recognized as the single largest environmental risk to human health & also an avoidable cause of death & disability to health. It is a very serious health issue in the country particularly in many of the Indian cities. Health sector deals on the issues through various health adaptation mechanisms while the other sectors address the issues by taking mitigating actions on the pollution

National Clean Air Programme (NCAP) is a national level strategy to tackle the air pollution problem across India. Under NCAP, 122 non-attainment cities have been identified across the country based on the Air Quality data from 2014-2018

OBJECTIVES

Stringent implementation of mitigation measures for prevention, control & abatement of air pollution. Augment & Strengthen air quality monitoring network across the country. Augment public awareness & capacity building measures

TARGET

National level target of 20-30% reduction of PM_{2.5} & PM₁₀ concentration by 2024

KEY COMPONENTS OF NCAP



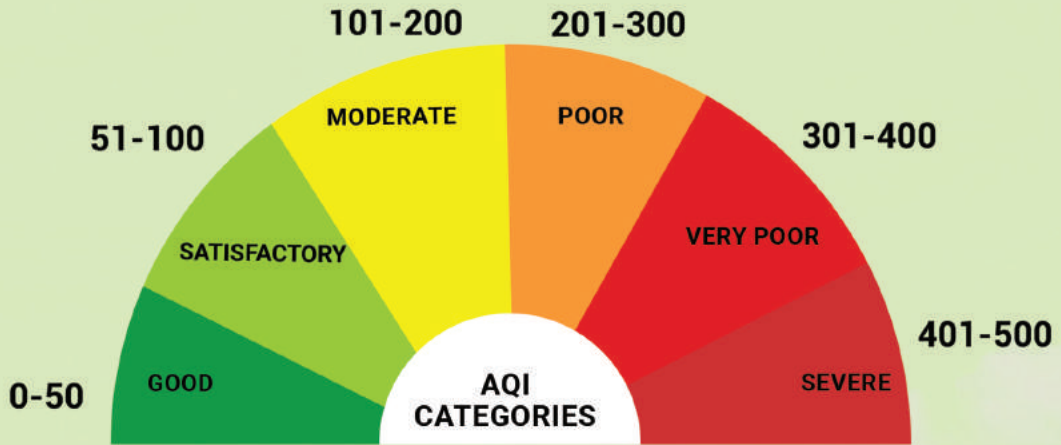
Non-Attainment Cities



KEY SECTORIAL INTERVENTIONS UNDER NCAP



UNDERSTANDING AIR QUALITY & AQI



AQI DESCRIPTION

DO YOU KNOW?



AQI is an effective tool for communication of air quality status to the general public, which transforms complex air quality data of various pollutants into a single number & color

There are six AQI categories, namely Good, Satisfactory, Moderately Polluted, Poor, Very Poor & Severe. Each of these categories is decided based on ambient concentration values of air pollutants & their likely health impacts (known as health breakpoints)

Air quality sub-index & health breakpoints are evolved for eight pollutants (PM_{10} , $PM_{2.5}$, NO_2 , SO_2 , CO , O_3 , NH_3 & Pb) in India



Graded Response Action Plan

GRAP is a PM (ambient particulate matter) concentration based Graded Response Action Plan for air pollution control on the basis of air quality data generated through Ambient Air Quality Monitoring Stations. A new category of "Severe+ or Emergency" has been added to GRAP

AQI limitations

Insufficient real-time air quality monitoring network in various cities of India. The data for real-time AQI is generated directly from the analyzers/monitors into the system without any manual scrutiny, therefore this data is indicative in nature & may not be used for statutory purposes

HOW TO CHECK AQI OF YOUR CITY?

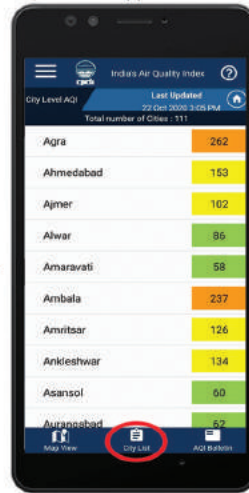
- You need to download **SAMEER APP**: Google play store for  users
App Store for  users
- After downloading the app



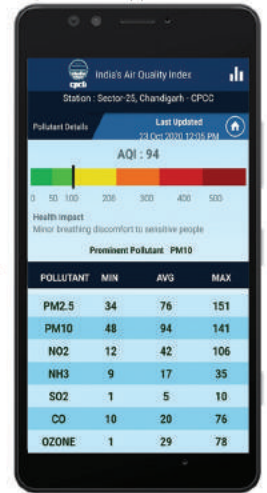
This screen will appear



Check AQI from the "MAP VIEW"

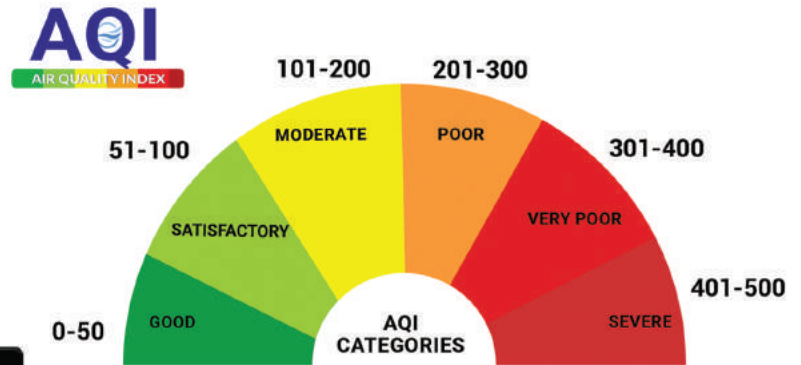


Go to "CITY LIST" for city-wise details of AQI



Select a City name for detail information

- Check AQI directly from website https://app.cpcbcr.com/AQI_India



Do you know the AQI display sites in your city?

For example Chandigarh has 7 prominent places where AQI is displayed

- Sector-17
- Railway Station
- Panjab University
- PGI
- CPCC, Sector-19B
- Sukhna Lake
- ISBT, Sector 43

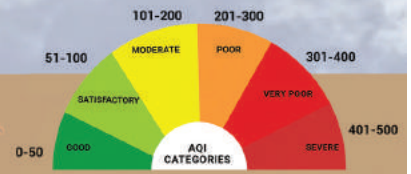


MAJOR HEALTH ADAPTATION ACTION PLAN ON AIR POLLUTION



Situational Analysis of Illnesses

- Identification of vulnerable area
- Selection of air pollution hotspot as per AQI level
- Vulnerable population: Under five year children, adolescents, elderly, pregnant females



Public Health Management of Illnesses



- Appropriate manpower in the hospital
- Enlisting of essential & desirable logistics, drugs, vaccine etc. for managing health issues

Establish Surveillance on Illnesses to Help Understand the Health Problems in the Area

- Selection of sentinel surveillance cities
- Selection of sentinel surveillance hotspot
- Conduction of surveillance



Need-Based Capacity Infrastructure



- Building, training, workshop, meeting to be conduct to sensitise
- Update on activities related to air pollution

Awareness Generation

- Awareness through audio, visual & print media
- Mass campaign using print Information Education & Communication (IEC) or electronic messages
- Advisory & public awareness (street plays, wall paint, etc)



Timely Issue of Warning/Alerts to Health Professionals & General Population



HEALTH ALERT

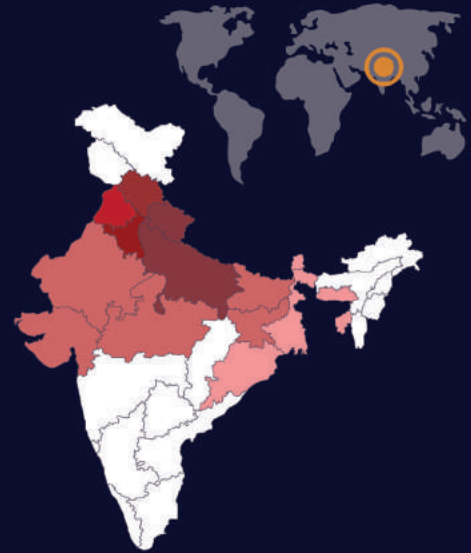
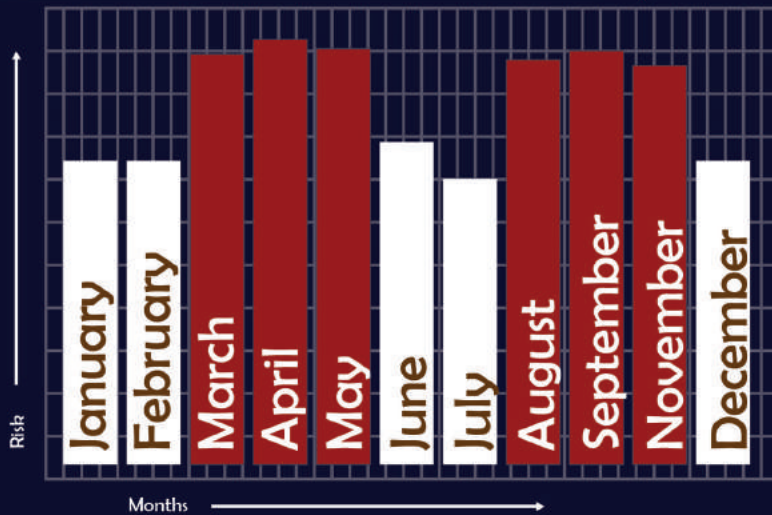
- Coordinate with other sectors for timely issue of alert/early warning
- Warning such as AQI levels & other relevant data

MAJOR HEALTH ADAPTATION ACTION PLAN ON AIR POLLUTION

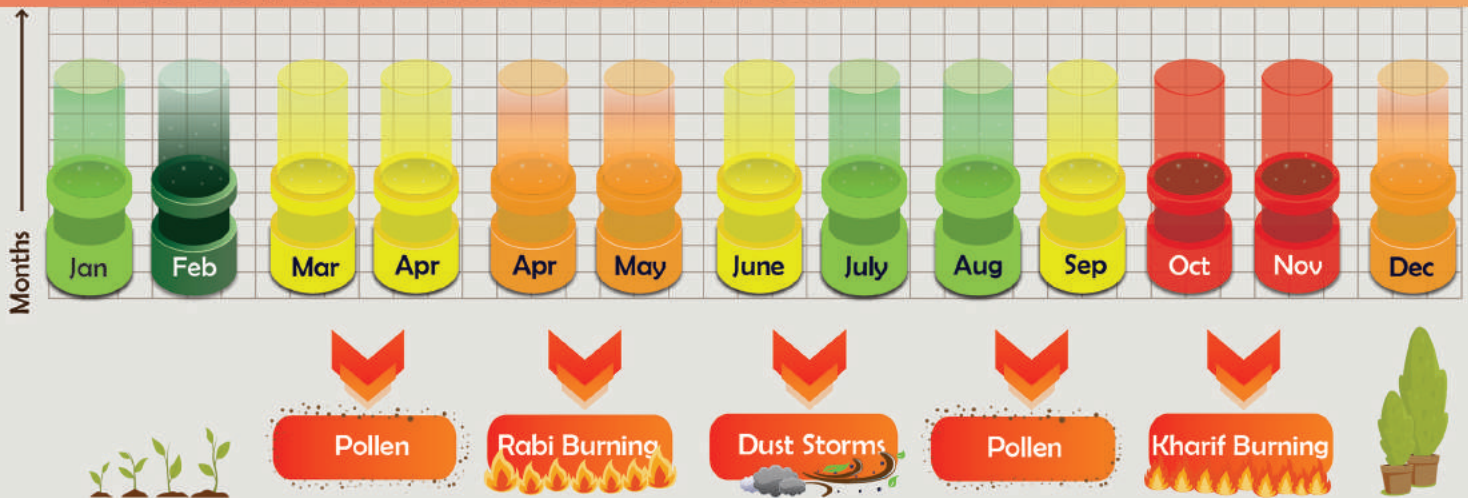


CONDUCT VULNERABILITY MAPPING

(As per AQI)



PREPARE A DISEASE CALENDER



RESOURCE MAPPING/STATUS



AQI CATEGORIES & HEALTH ADVISORIES FOR VULNERABLE POPULATIONS

AIR QUALITY INDEX

CATEGORY	AQI RANGE	PUBLIC HEALTH ADVISORIES FOR VULNERABLE POPULATION		
		HEALTHY PEOPLE	ELDERLY, PREGNANT WOMEN & CHILDREN	PEOPLE WITH CHRONIC HEART & LUNG DISEASES
Good	0-50	Good day to be active outside	Good day to be active outside	Good day to be active outside
Satisfactory	51-100	No precautions required	Limit prolonged or heavy physical exertion during peak AQI level	Limit prolonged or heavy physical exertion during peak AQI level
Moderate	101-200 Concentration values of Ambient $PM_{2.5}$ 61-120 $\mu g/m^3$ or PM_{10} 101-350 $\mu g/m^3$	Limit outdoor activities during peak AQI level	Reduce prolonged or heavy exertion during peak AQI level	Limit activities in polluted areas & re-schedule outdoor activities as per AQI level
Poor	201-300 Concentration values of Ambient $PM_{2.5}$ 61-120 $\mu g/m^3$ or PM_{10} 101-350 $\mu g/m^3$	Reduce prolonged or heavy exertion	Avoid prolonged or heavy exertion	Avoid exposure to polluted areas Reduce activities & avoid prolonged heavy exertion
Very Poor	301-400 Concentration values of Ambient $PM_{2.5}$ 121-250 $\mu g/m^3$ or PM_{10} 351-430 $\mu g/m^3$	Avoid prolonged or heavy exertion	Avoid all physical activities outdoor & should avoid exposure to source of air pollution	Avoid all physical activities outdoors Avoid exposure to sources of air pollution Keep prescribed medication readily available Seek medical advice if needed
Severe	401-500 Concentration values of Ambient $PM_{2.5}$ ~250 $\mu g/m^3$ or PM_{10} 430 $\mu g/m^3$	May cause respiratory impact even on healthy people, & serious health impacts on people with lungs/heart disease. The health impacts may be experienced even during light physical activities. No outdoor activities		

Source: CPCB

AQI & HEALTH SECTOR PREPAREDNESS

CATEGORY	AQI RANGE	HEALTH SECTOR PREPAREDNESS (ACTION PLAN)
Good	0-50	Conduct general awareness activities concerning health impacts of air pollution
Satisfactory	51-100	Issue alerts to vulnerable population & chronically ill patients to take medical aid if they feel any health problem
Moderate	101-200 <i>Concentration values of Ambient $PM_{2.5}$ (61-120 $\mu\text{g}/\text{m}^3$) or PM_{10} (101-350 $\mu\text{g}/\text{m}^3$)</i>	Conduct awareness campaign to sensitise health care workers, patients & the general public on air quality & its possible acute & chronic health impacts
Poor	201-300 <i>Concentration values of Ambient $PM_{2.5}$ (61-120 $\mu\text{g}/\text{m}^3$) or PM_{10} (101-350 $\mu\text{g}/\text{m}^3$)</i>	To maintain morbidity data including emergency, OPD & hospital admissions in relation to AQI Issue alerts to the health sector for ensuring preparedness, stocking drugs & checking equipments for managing cardio-respiratory & other illnesses related to air pollution Issue alerts for vulnerable population for keeping a check on symptoms
Very Poor	301-400 <i>Concentration values of Ambient $PM_{2.5}$ (121-250 $\mu\text{g}/\text{m}^3$) or PM_{10} (351-430 $\mu\text{g}/\text{m}^3$)</i>	All the Above measures along with following advisory to health services for : Ensuring preparedness, stocking drugs, oxygen & equipments, ambulance services for managing illnesses due to worsening of AQI Implement action plan for Air Pollution related illnesses in coordination & collaboration with other stakeholders
Severe	401-500 <i>Concentration values of Ambient $PM_{2.5}$ (~250 $\mu\text{g}/\text{m}^3$) or PM_{10} (430 $\mu\text{g}/\text{m}^3$)</i>	All the Above measures with increased intensity & frequency along with: Issue of awareness material & Alerts in newspapers/TV/radio/ social media to protect health & restrict outdoor movement. To co-ordinate with other administrative authorities for restriction of exposure like closure of schools & teaching institutes & other sports/recreational outdoor activities during high AQI Activate helpline & share the number in public domain



Awareness



Preparedness



Contingency Plan



Health Advisories

HEALTH CARE FACILITIES PREPAREDNESS ON AIR POLLUTION

A committee on Air Pollution & Health in the hospital to be made preferably including officials from the departments of Medicine, Respiratory Medicine, Paediatrics, Cardiology, Neurologists, Endocrinologists etc. including Emergency & Nursing division and Pharmacists likely to involve in dealing the health issues



Development of a specific health action plan for the hospital/ health-care facilities to address the health issues related to air pollution in the area

Strengthening of healthcare services in the health facilities where the health problems in context of air pollution are likely to increase such as:

OPD for Paediatrics/Medicine/Respiratory Medicine/NCD Clinics etc. where the more cases are more likely to attend

Emergency services for illnesses related to respiratory, cardiovascular emergencies etc.

Counselling/Awareness Generation to patients/families & relatives

Enhancing functional Emergency/Hospital Beds/Emergency Medicines/Drugs/Equipments etc.

Enabling for more Community Outreach activities- awareness generation



Capacity Building of the Health professionals/workers to address the health issues in context of air pollution

Establishment of surveillance in context of air pollution to understand the health burden in context of air pollution in the area if required and its reporting



Preparation for Logistics, Drugs, Equipments that may be required to address health problems related to air pollution particularly respiratory & cardiovascular emergencies etc. such as

- Drugs for respiratory, cardiovascular & cerebrovascular emergencies etc. its procurements and maintaining its buffer stock
- Enhancing functional Nebulisers, Ventilators etc.as per dema
- Enhancing functional Oxygen cylinders or supply for increased demand of the cases
- Enhancing functional Ambulances etc.



WAYS TO INCREASE AWARENESS GENERATION ON AIR POLLUTION & HEALTH



Health Advisories

Issue health advisory on the basis of air quality & weather prediction



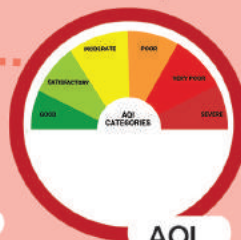
Conduct awareness campaign about health impacts of higher AQI as an initiative intended to enhance public awareness & involvement in efforts to improve air quality & reduce health impacts



Awareness



Health impacts



AQI



Involvement



Information dissemination on social media, mobile apps should be used to inform people about the pollution levels, contact details of the control room, enable them to report polluting activities/sources to the concerned authorities, & actions that will be taken by the government based on the level of pollution



Alert in newspapers/TV/radio to advise people with respiratory & cardiac patients to avoid polluted areas & restrict outdoor movement



Respiratory & Cardiac Patients



Avoid polluted areas



Develop & test a set of materials & strategies to educate health care workers, patients & the general public on the adverse health impacts of air pollution, & solutions that will help to protect public health



Activate self-help groups & district air pollution control helpline

Self-help groups



Pollution Control Helpline



PROMOTION OF PUBLIC PARTICIPATION & ENGAGEMENT : TO REDUCE AIR POLLUTION

Encourage people to contribute in reduction of air pollution by



Tires Pressure PUC

Maintaining vehicles properly



Following traffic rules, lane discipline & speed limits



Avoiding prolong idling & turning off engines at red traffic signals



Use clean smokeless fuels (gas or electricity) for cooking & heating purposes



Avoid using private vehicles & instead use public transport, bikes or walk, & carpool; use smaller vehicles (e.g., avoid SUVs)



Support farmers to stop stubble burning



Avoid burning biomass (As fuel or for heating purposes)



Do not burn trash

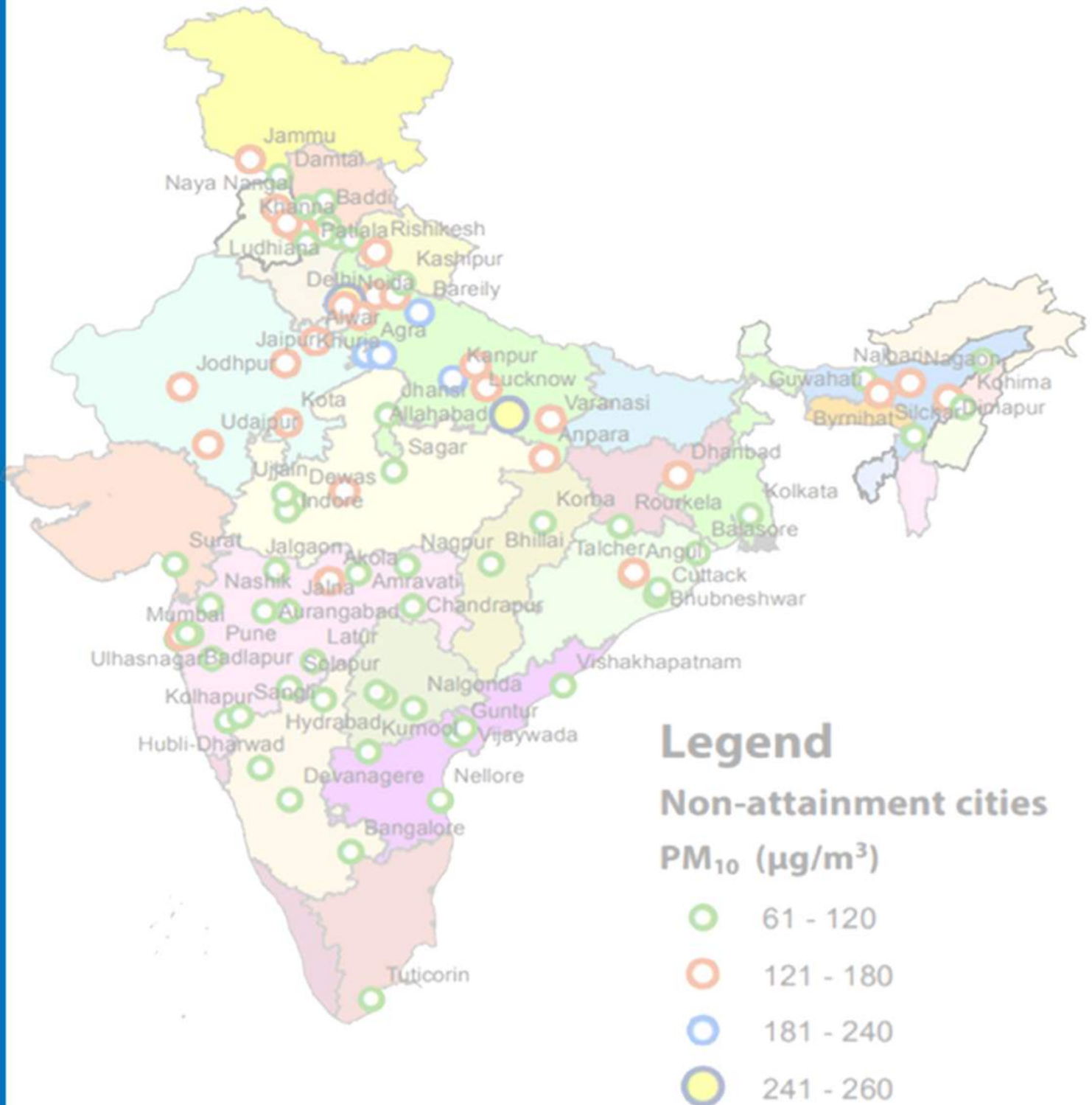


Use of non-polluting source for running vehicles, machineries, industries, checking measures to reduce air pollution levels

People can report violations cases as well as polluting sources through different apps launched by the government like "Hawa Badlo"



NOTES



Air quality Monitoring Network

Extensive Plantation Drive

National Emission Inventory

Air Information Centre

State, City & Regional Action Plan for Non-attainment cities

Capacity Building

Intensive training & Awareness

NOTES




Certification
System for monitoring
instruments


International
Cooperation


Source apportionment
for non-attainment
cities


Network of
technical
Institutions

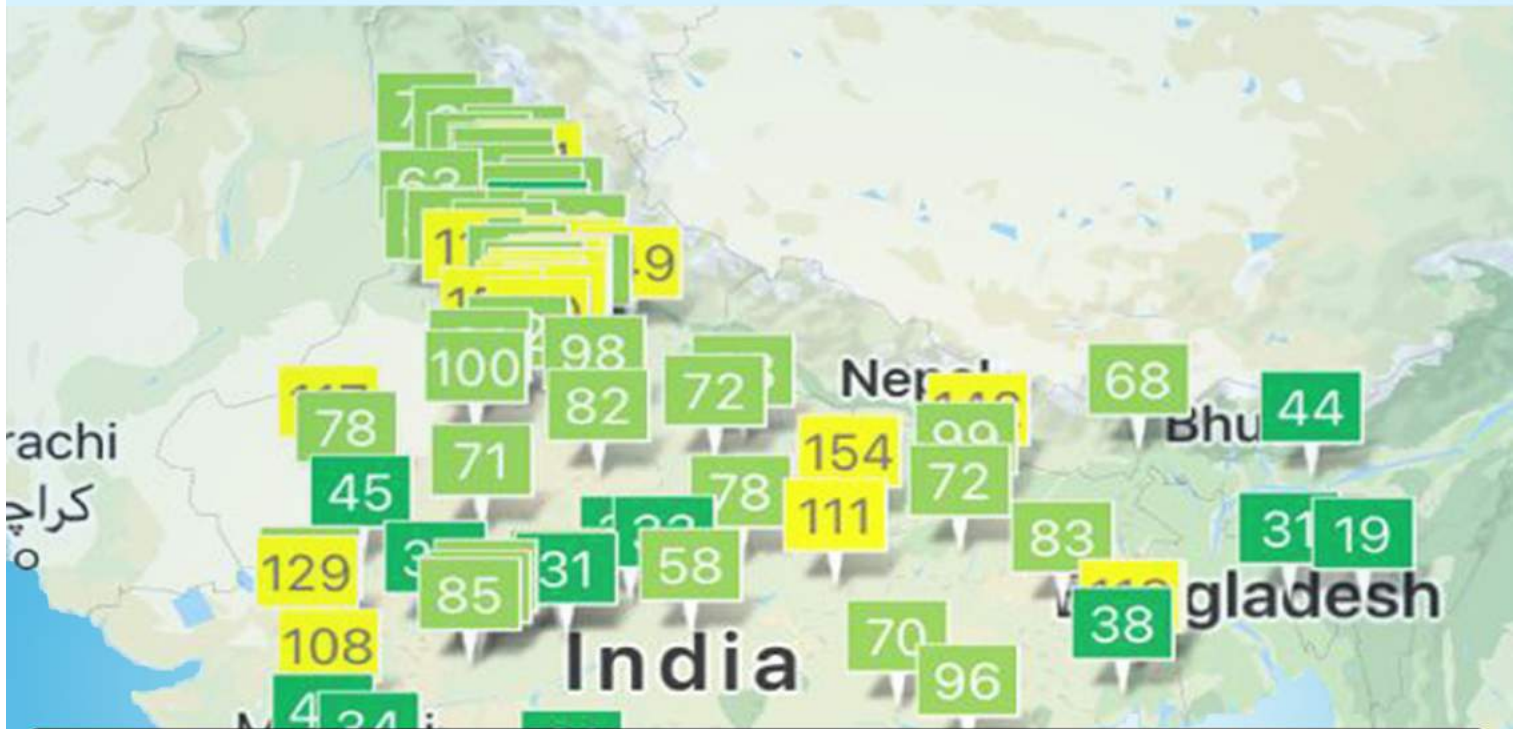

Technology
Support


Technology
Assesment Cell


Health Impact
Studies



सत्यमेव जयते



This infographic booklet is based on Health Sector Preparedness for Air Pollution related illness prepared under the National Program on Climate Change & Human Health. It is a quick guide to understand how the health care facilities has to be prepared to respond to the increasing need of the health care services of the people due to worsening air pollution.

