



सत्यमेव जयते

Government of India

Ministry of Environment, Forest and Climate Change

AIR POLLUTION & COVID-19 MITIGATION STRATEGIES

LET'S BE PART OF THE SOLUTION



Dr. Suman Mor
Dr. Ravindra Khaiwal





आर पी गुप्ता
R P Gupta



सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE



FOREWORD

It is recognized globally that COVID-19 has caused a serious impact on human health by affecting the respiratory system. Among all the people, COVID-19 could disproportionately affect the vulnerable population i.e. elderly and people with diseases. The higher levels of air pollution also increase the susceptibility of COVID-19 especially in the vulnerable population. The poor air quality affects our lungs and other body organs, increasing the risk of various respiratory diseases. Understanding the correlation of poor air quality and COVID-19 is extremely important to respond wisely to reduce the impact on respiratory system. In COVID-19 times, air pollution can worsen the health condition of a person with respiratory and circulatory diseases and may lead to severity of cases.

Bringing awareness about air pollution sources (indoor as well as ambient) and associated health impacts in COVID-19 times has become utmost important. Addressing the issue of air pollution will help and lead to decline in morbidity and mortality as well as decline in respirable related illnesses during COVID-19 pandemic. To address these issues complete awareness and preventive measures about poor air quality and COVID-19 is very essential.

I commend the efforts of Dr. Suman Mor, Department of Environment Studies, Panjab University, Chandigarh and Dr. Ravindra Khaiwal, Department of Community Medicine & School of Public Health, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh for bringing out the infographic booklet on "Air Pollution & COVID-19 Mitigation Strategies."

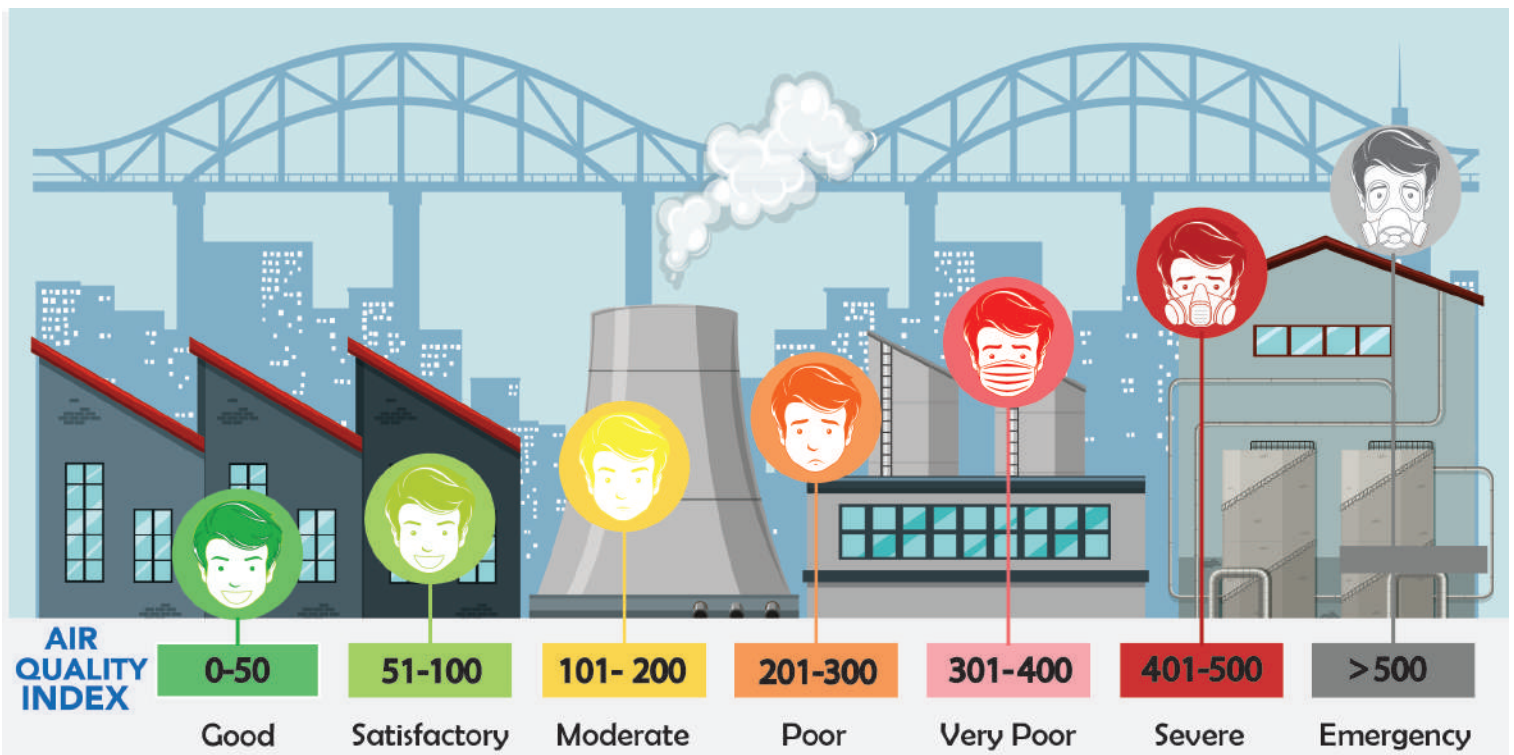
I am sure that this infographic booklet on air pollution & COVID-19 mitigation strategies will help to create awareness among the public and aid to minimize the adverse health impact of air pollution and COVID-19.

New Delhi
18th February, 2021

(R P Gupta)

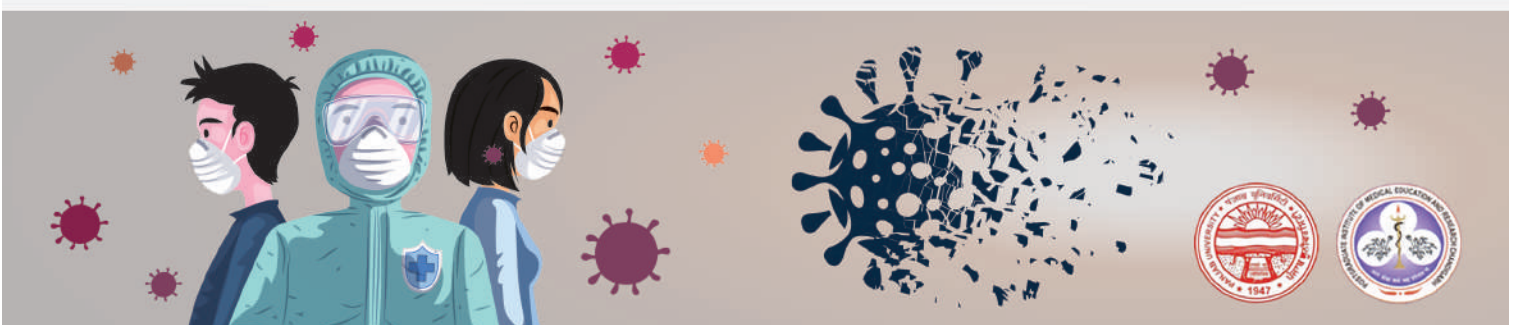
इंदिरा पर्यावरण भवन, जोर बाग रोड, नई दिल्ली-110 003 फोन: (011) 24695262, 24695265, फैक्स: (011) 24695270

INDIRA PARYAVARAN BHAWAN, JOR BAGH ROAD, NEW DELHI-110 003 Ph.: (011) 24695262, 24695265, Fax: 011-24695270
E-mail: secy-moef@nic.in, Website: moef.gov.in



2	Outdoor Air Pollution
3	Indoor Air Pollution
4	Linkages between Air Pollution & COVID-19
5	Poor Air Quality & COVID-19
6	Preventing Air Pollution & COVID-19 : Household & Indoor Air Pollution
7	Preventing Air Pollution & COVID-19 : Improve Ventilation
8	Preventing Air Pollution & COVID-19 : Graded Response Action Plan
9	Simple Actions for Corona Prevention

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



OUTDOOR AIR POLLUTION

MAJOR SOURCES



VEHICLE



FACTORY



WASTE BURNING



BIOMASS BURNING

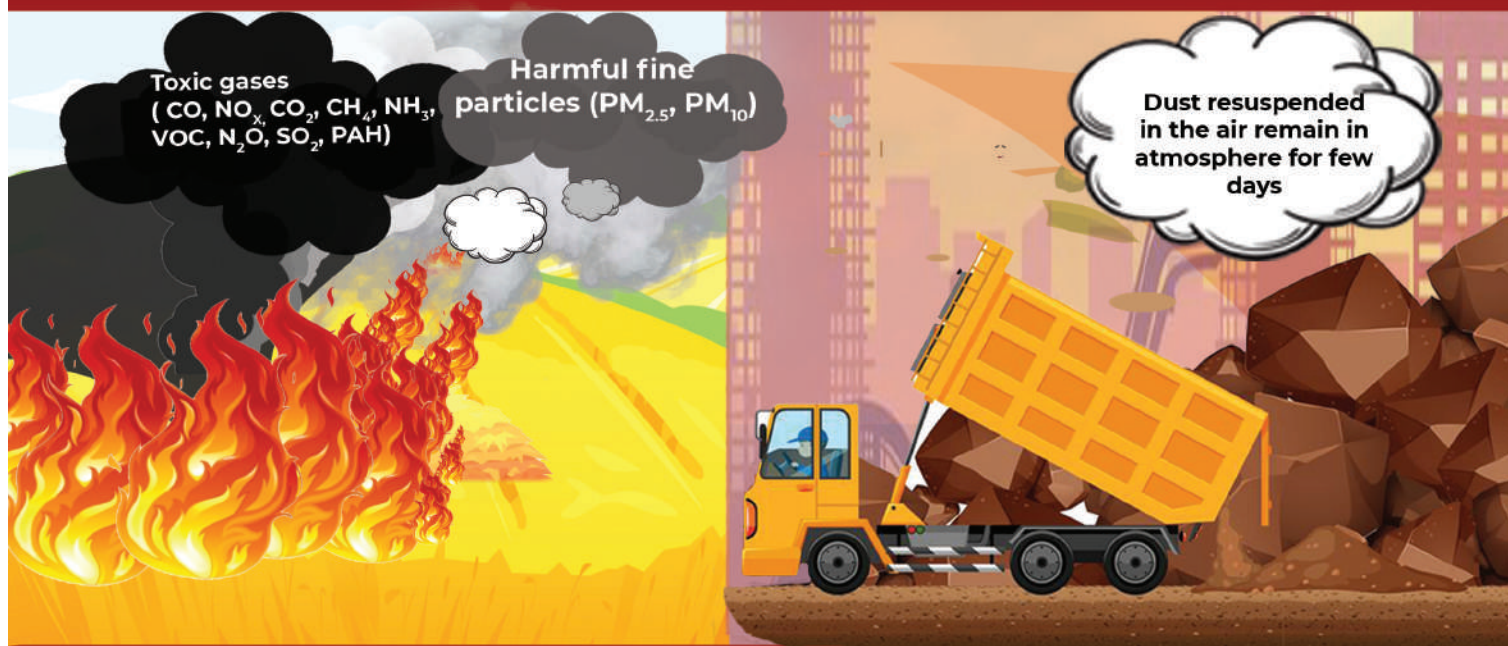
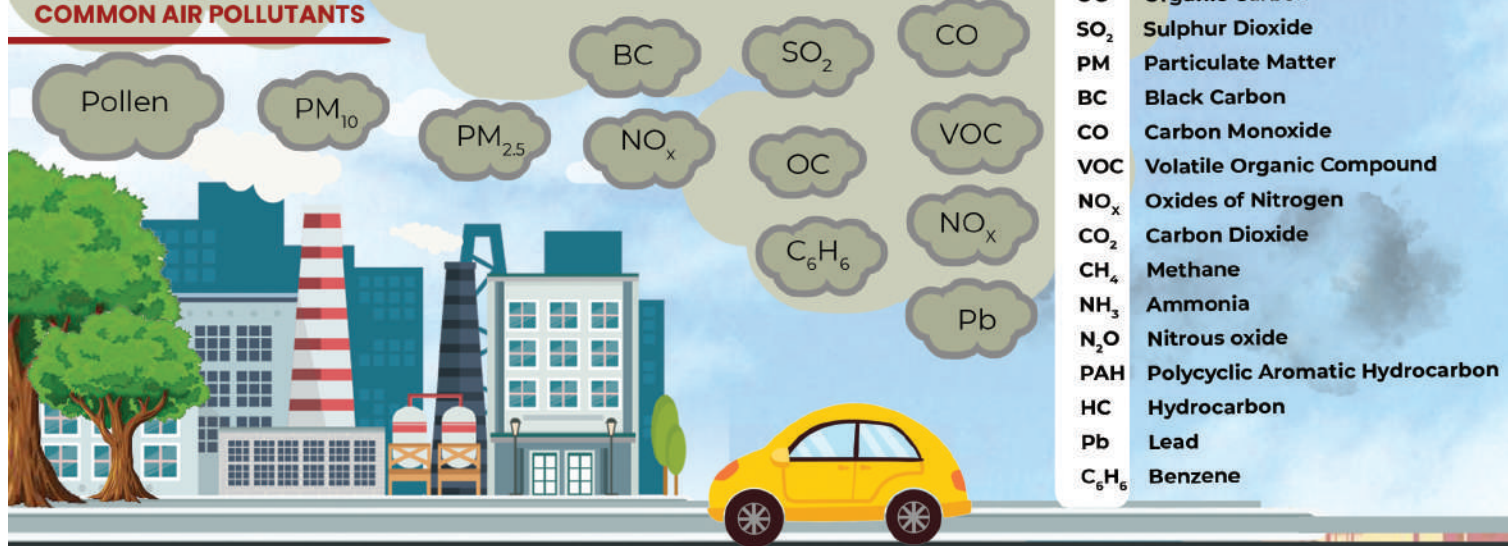


POLLEN



CHEMICAL SPRAY

COMMON AIR POLLUTANTS



HEALTH IMPACTS



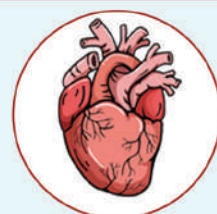
Acute lower respiratory infections In children



Stroke



Chronic Obstructive Pulmonary Disease



Ischaemic Heart diseases



Lung Cancer

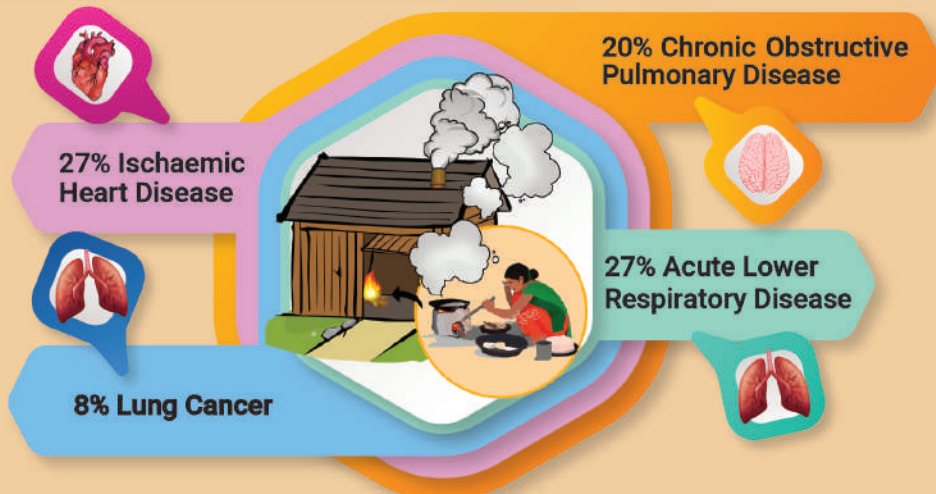


INDOOR AIR POLLUTION



HOUSEHOLD AIR POLLUTION

Globally Attributed to Premature Deaths



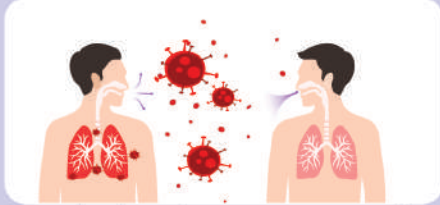
LINKAGES BETWEEN AIR POLLUTION & COVID-19

COVID-19 is an infectious disease caused by corona virus (SARS-CoV-2) & primarily transmits through exposure to virus carrying respiratory droplets



Transmission can be through multiple ways:

DROPLET TRANSMISSION:



Spread through exposure to virus containing respiratory droplets exhaled by an infected person

CONTACT TRANSMISSION:



Spread through direct contact with an infected person or his belongings

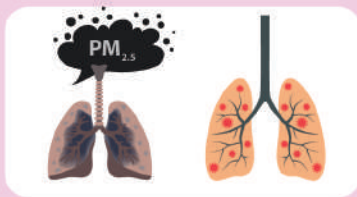
AIRBORNE TRANSMISSION:



Spread through exposure to virus containing aerosols laden smaller droplets & particles which remain suspended in air & can travel longer distance

LINKAGES BETWEEN COVID-19 & AIR QUALITY

COVID-19 is mainly a disease of respiratory system & high air pollution will increase the susceptibility especially in the vulnerable population



Air Pollution & COVID-19

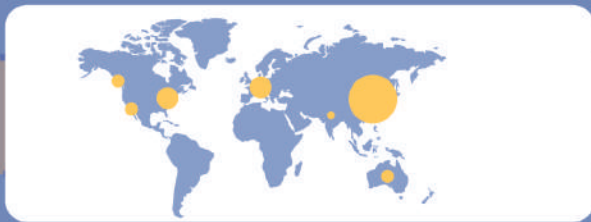


Air Pollution & Health Effects

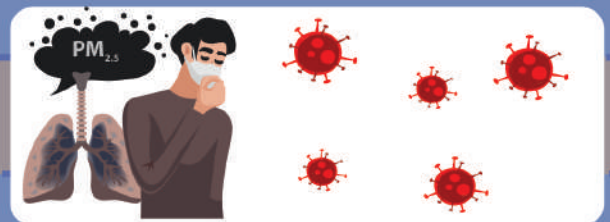


Vulnerable Group

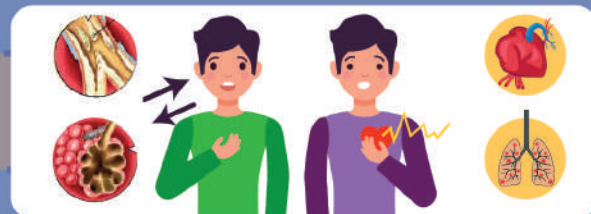
POOR AIR QUALITY & COVID-19



- Globally, 7 million premature deaths are attributable air pollution & around 94% of these deaths occur in low & middle income countries



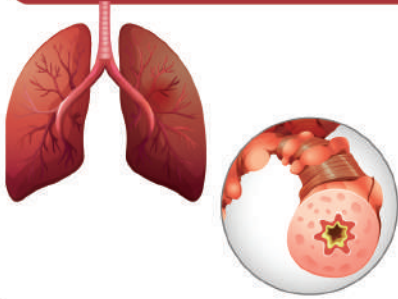
- Air pollution is most likely a contributing factor to the health burden caused by COVID-19



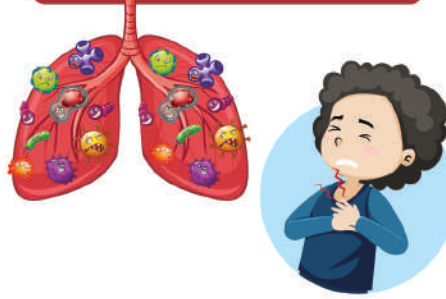
- Poor air quality is a main risk factor for both acute & chronic, respiratory & cardiovascular disease
- People with underlying medical conditions are at greater risk of developing severe illness from COVID-19 infection

POOR AIR QUALITY & COVID-19

CHRONIC OBSTRUCTIVE PULMONARY DISEASE



PNEUMONIA



ASTHMA

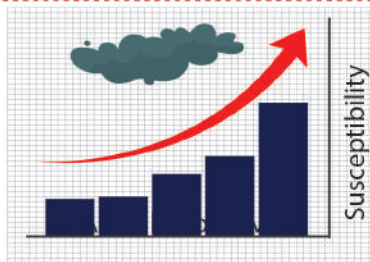
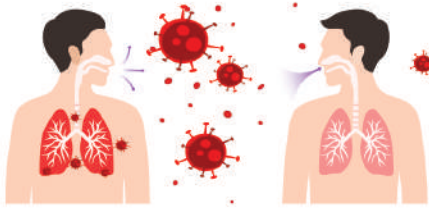


Poor air quality affects our lungs & other body organs. It increases the risk of chronic respiratory diseases like COPD, asthma, pneumonia etc.

AIR POLLUTION & CARDIOVASCULAR DISEASE PROGRESSION



The micro particles (<math><PM_{2.5}</math>) have potential to reach the bloodstream & can affect our cardiovascular & circulatory system



COVID-19 is caused by respiratory pathogen & high air pollution can increase the susceptibility especially in the vulnerable population

Check AQI directly https://app.cpcbcr.com/AQI_India Know your city's AQI

Air pollution can exacerbate respiratory & circulatory diseases in patients & vulnerable population & can also increase the severity of development of more serious illnesses

PREVENTING AIR POLLUTION & COVID-19 : HOUSEHOLD & INDOOR AIR POLLUTION

IMPROVE HOUSEHOLD AIR QUALITY

Cook in a well ventilated area or kitchen



While cooking keep windows open

Cooking with wet fuel create more emissions, hence more harmful to health



Avoid cooking in enclosed environment using solid biomass fuel

Schemes to Promote Healthy Clean Fuel



IMPROVE INDOOR AIR QUALITY

Avoid using mosquito coils, incense sticks, room fresheners

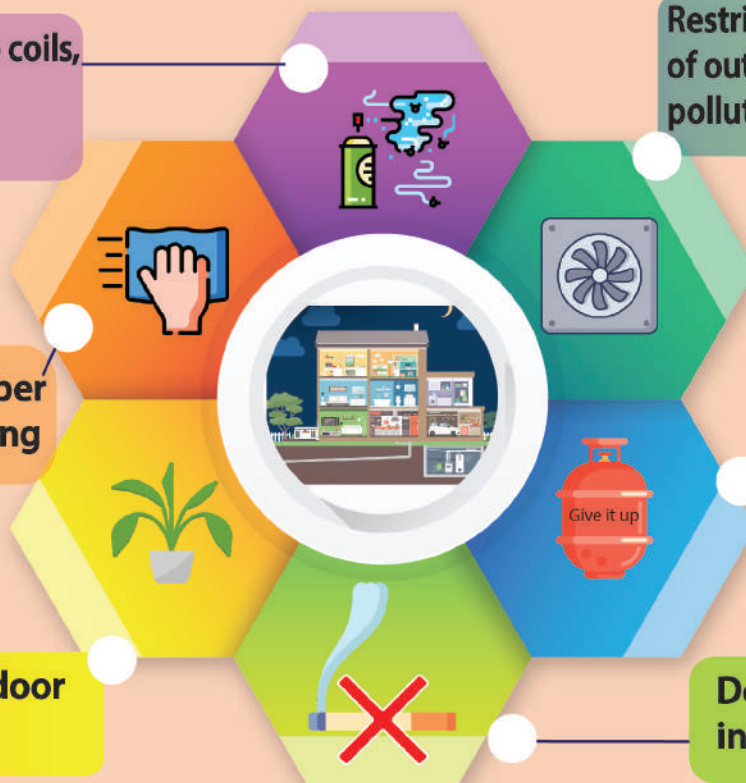
Restrict the indoor infiltration of outdoor air during high pollution levels

Use swabs & microfiber cloths for daily dusting

Use cleaner fuels while cooking

Use more indoor plants

Don't allow smoking indoors



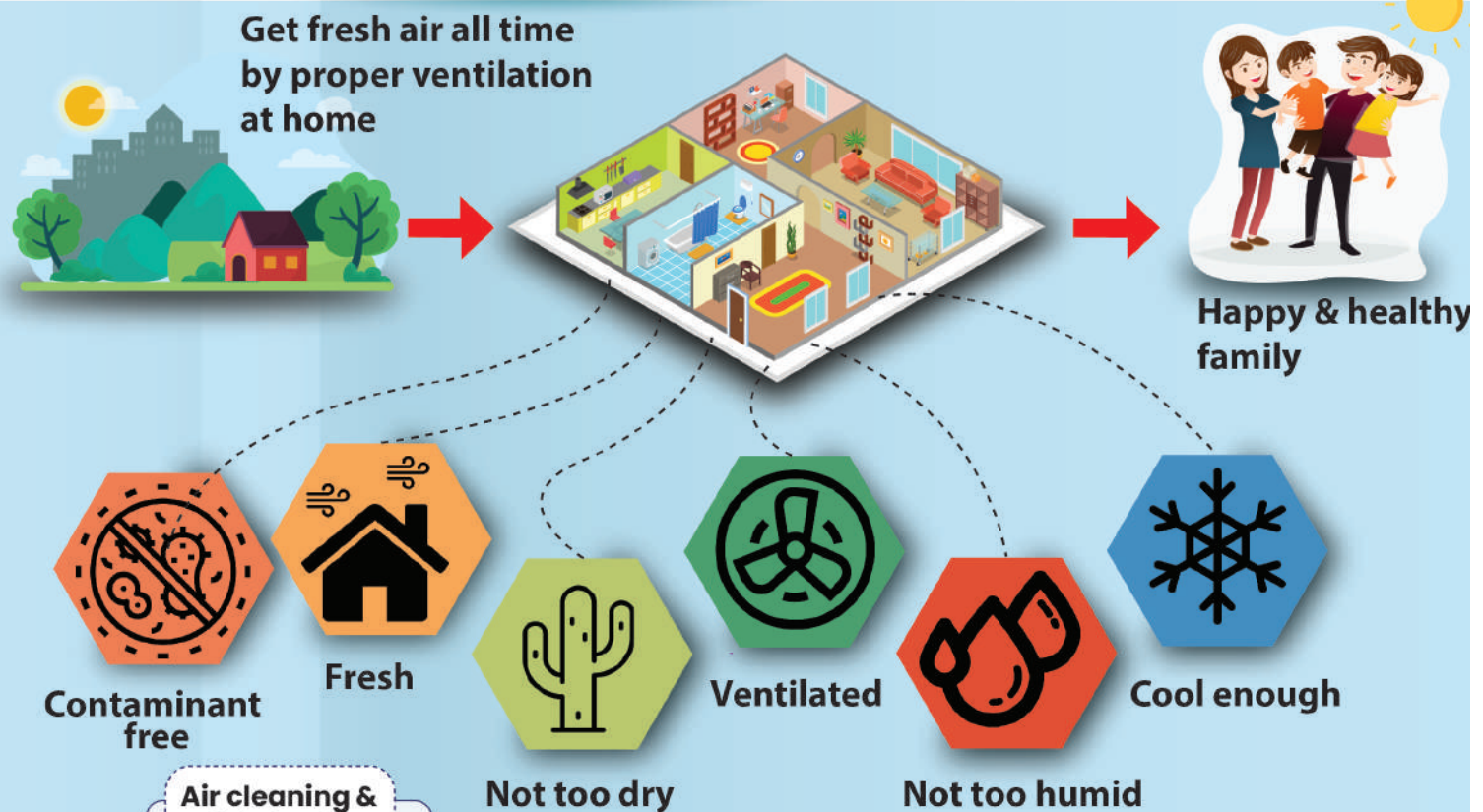
PREVENTING AIR POLLUTION & COVID-19 : IMPROVE VENTILATION



People spending prolonged hours in confined & poorly ventilated rooms are at high risk of COVID-19 transmission



Improve ventilation in indoor environment (e.g. office/workplace, hospital, schools, cinema halls, shopping malls)



Ensure adequate ventilation system during winter & according to outdoor AQI level



Adequate ventilation help to prevent the spread of COVID-19 in indoor environment



PREVENTING AIR POLLUTION & COVID-19

: GRADED RESPONSE ACTION PLAN

Severe+ or Emergency

(PM_{2.5} over 300 µg/m³ or PM₁₀ over 500 µg/m³ for 48+hours)

City may restrict the entry of heavy vehicle (e.g. Trucks) except for essential commodities



Introduce odd/even scheme for private vehicles & minimise exemptions



Stop construction work



Set up a task force to decide any additional steps including shutting of schools



Severe

(PM_{2.5} over 250 µg/m³ or PM₁₀ over 430 µg/m³)

Close brick kilns, hot mix plants, stone crushers



Maximise power generation from natural gas to reduce generation from coal



Encourage public transport, with differential rates



More frequent mechanized cleaning of road & sprinkling of water



Very Poor

(PM_{2.5} 121-250 µg/m³ or PM₁₀ 351-430 µg/m³)

Stop use of diesel generator sets



Increase bus & Metro services



Enhance parking fee by 3-4 times



Apartment owners to discourage burning fires in winter by providing electric heaters during winter



Moderate to poor

(PM_{2.5} 61-120 µg/m³ or PM₁₀ 101-350 µg/m³)

Heavy fines for garbage burning



Mechanized sweeping on roads with heavy traffic & water sprinkling



Enforce pollution control regulations in brick kilns & industries

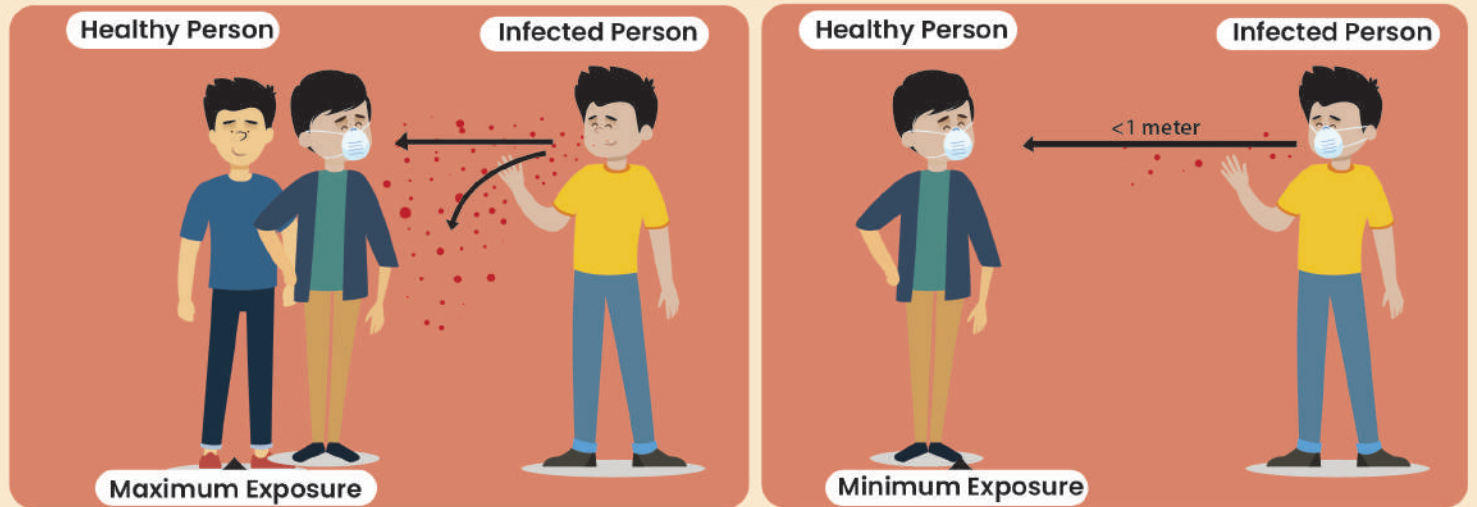


Strictly enforce a ban on firecrackers



SIMPLE ACTIONS FOR CORONA PREVENTION

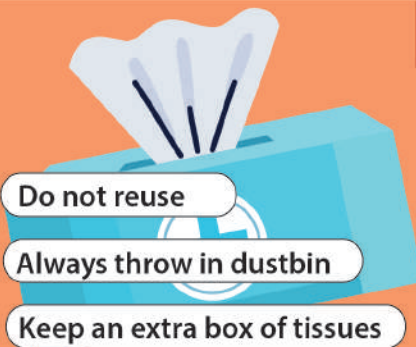
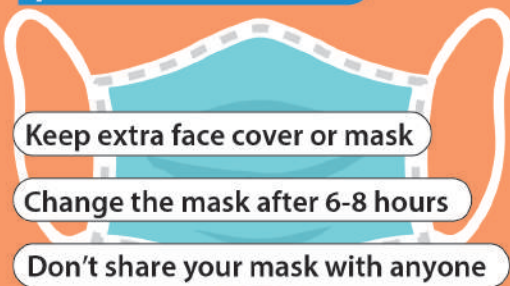
Maintain respectful distance of 1.5 meter & wear mask. It reduces the risk of exposure from the asymptomatic person & also minimises air pollution exposure



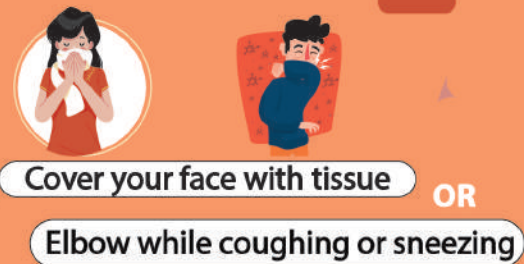
Wearing properly fitted mask or facecover prevents exposure to coronavirus & air pollutants



BEST PRACTICES



COUGH ETIQUETTE



COVID-19 APPROPRIATE BEHAVIOUR



LET'S GET THE VACCINE





This booklet describes the impact of air pollution on COVID-19 & the preventive measures. It will help public to take adaptive measures to protect from impacts of air pollution & COVID-19.



Dr. Suman Mor

Associate Professor and Chairperson
Department of Environment Studies
Panjab University, Chandigarh -160014, India



Dr. Ravindra Khaiwal

Additional Professor of Environment Health
Department of Community Medicine and
School of Public Health PGIMER
Chandigarh -160012, India

