



Ministry of Health & Family Welfare
Government of India



National Centre for Disease Control (NCDC)
Government of India
New Delhi

THE NATIONAL PROGRAM ON CLIMATE CHANGE AND HUMAN HEALTH (NPCCHH)

Flipchart
for
Community Level Training
on
Air Pollution and its Impact on Health
of Traffic Police Personnel



National Centre for Disease Control (NCDC),
Directorate General of Health Services (DGHS)

MINISTRY OF HEALTH AND FAMILY WELFARE
GOVERNMENT OF INDIA

2020



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सत्यमेव जयते

राष्ट्रीय रोग नियंत्रण केंद्र
स्वास्थ्य सेवा महानिदेशालय
स्वास्थ्य एवं परिवार कल्याण मंत्रालय भारत सरकार
National Centre for Disease Control (NCDC)
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PREFACE

Traffic policemen, an important group of frontline workers in the COVID-19 pandemic times, play an indispensable role in managing the traffics on the roads for smooth flow of movements of all types of commuters and their safety. While on duty as outdoor professionals, they are continuously exposed to ambient air which is comparatively more polluted due to various reasons including vehicular exhausts or dusts etc. As air pollution is a recognized environmental health risk, traffic policemen are reported more vulnerable to air pollution and its negative health impacts like irritation of our external organs such as eyes and skin and also, main systems of our human body like respiratory problems, cardiovascular problems etc. Various study reports also are showing positive correlation between air pollution and health of the traffic policemen. Therefore, health adaptive measures need to be taken up to protect and prevent traffic police policemen from negative health effects of air pollution.

To address the health related issues among the traffic policemen in context of air pollution, the Centre for Environmental and Occupational Health, Climate Change and Health (CEOHCCH) division at National Centre for Disease Control, Directorate General Health Services, the Ministry of Health and Family Welfare has developed recently a document on 'Training manual on air pollution



and its health impact on Traffic Police' under the National Program on Climate Change and Human Health (NPCCHH).The programme would share the manual with the States/UTs and other relevant stakeholders to help increase the awareness level on the ill effects of air pollution and various adapting measures to protect and prevent the vulnerable group of traffic policemen. The traffic police departments in the States/UTs can also refer these manuals to raise awareness level among their staff members.

I extend my gratitude to all the valuable partners including, WHO India and PHFI, for their valuable contributions in shaping this vital manual.

I am sure that this training manual on "Training manual on air pollution and its impact on Traffic Police" will help protect and improve the health of traffic policemen who serve to regulate the road traffics and safety for all the commuters.

I laud efforts from all others who take part in making this manual an invaluable document for the programme to enable improving better health for a large number of traffic policemen across the country.

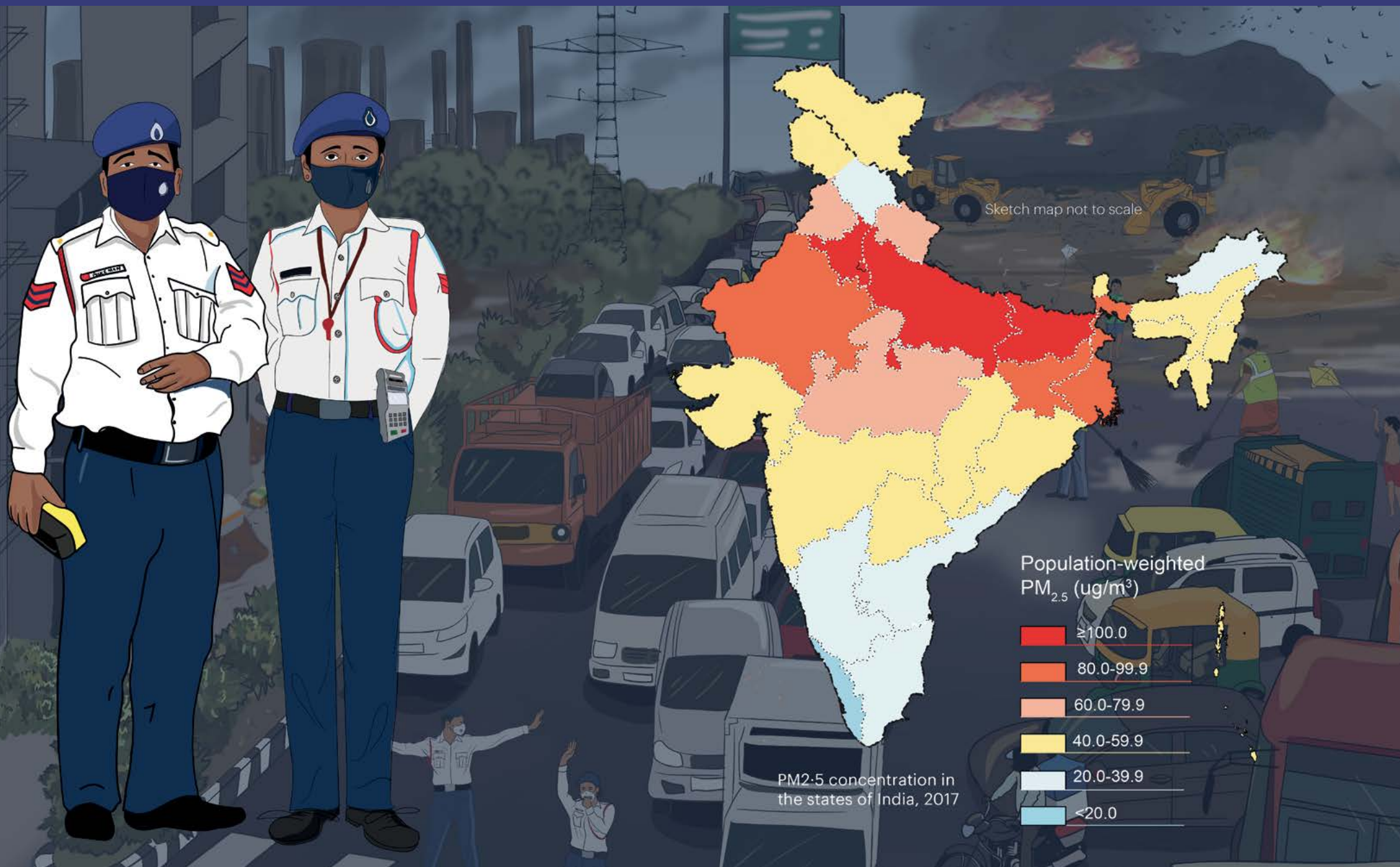


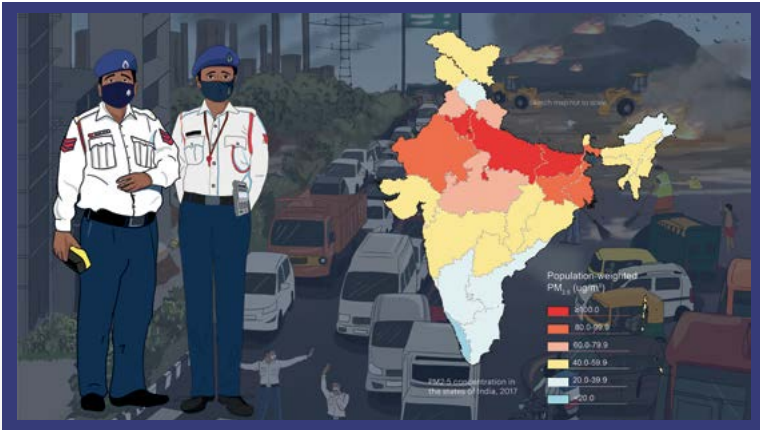
(Sujeet K. Singh)

निर्देशक

Director

1 AIR POLLUTION





1

AIR POLLUTION

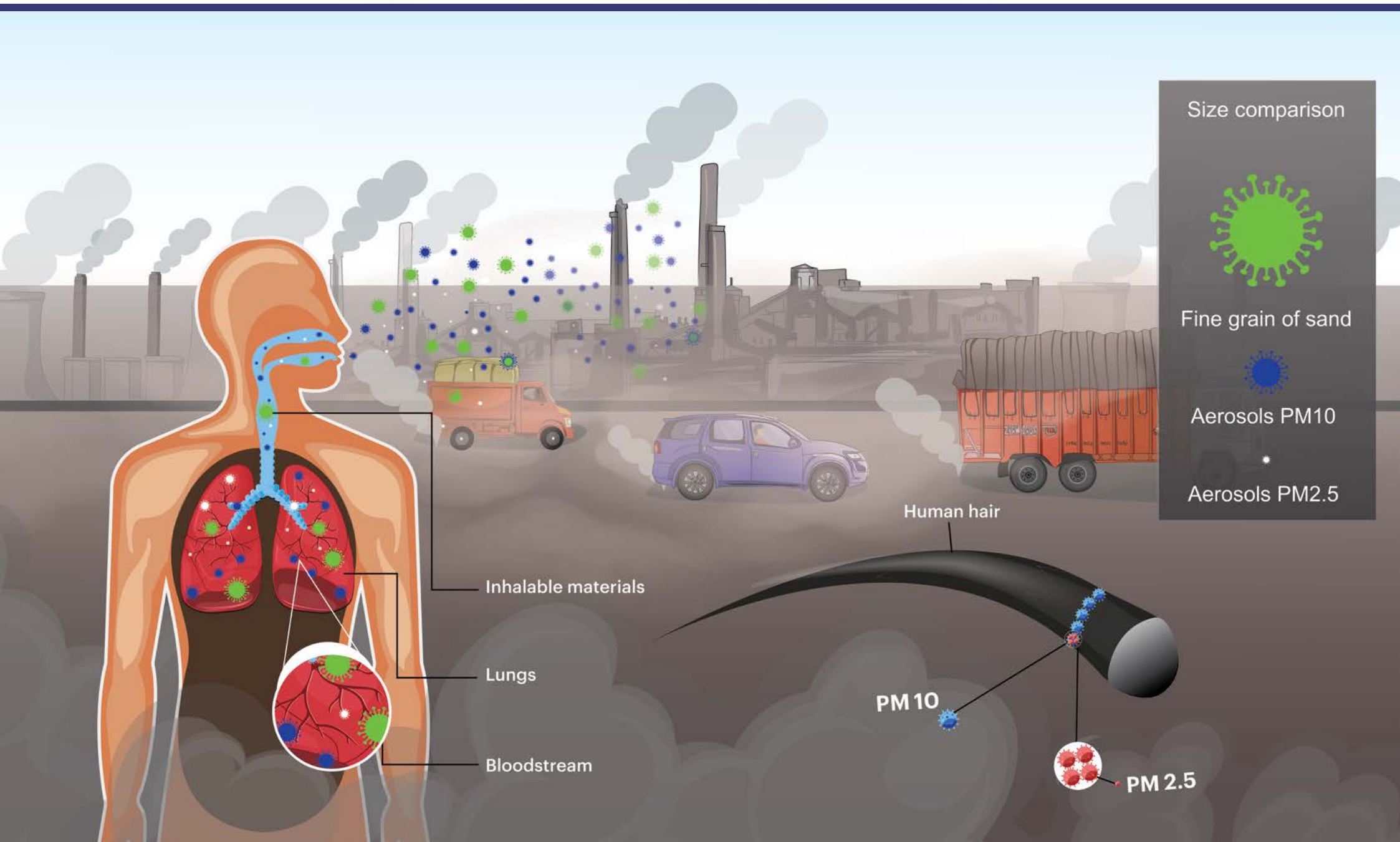
Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical or biological agent that change the natural state of the atmosphere

- » Clean Air is a human right and it is important for a safe environment and also for your health
- » Benefits of Clean Air: Healthier lungs, better neurocognitive status, fewer illness and deaths related to lung and heart diseases, healthier nature and environment
- » Threats from Polluted Air: negative socio-economic impact, increase medical costs, affect work productivity, and damage to biodiversity. So, the air we breathe- if polluted, can cause a lot of severe health effects
- » There are two types of Air Pollution: Outdoor/Ambient and Indoor
- » Air pollution is one of the biggest environmental health threats and also known as the Invisible Killer

Did you Know?

- » In India, number of deaths and diseases due to air pollution are very high
- » In 2017, 1.24 million deaths were due to air pollution. Out of this, 51.4% were in people younger than 70 years including 0.67 million from outdoor pollution and 0.48 million from household air pollution
- » An average, ambient particulate matter PM2.5 in India was 89.9 $\mu\text{g}/\text{m}^3$ in 2017. Most states and about 76.8% of the population of India, were exposed to PM2.5 greater than 40 $\mu\text{g}/\text{m}^3$ approximately, which is the limit recommended by the National Ambient Air Quality Standards in India

2 AIR POLLUTANTS



Size comparison



Fine grain of sand



Aerosols PM10

Aerosols PM2.5

Human hair

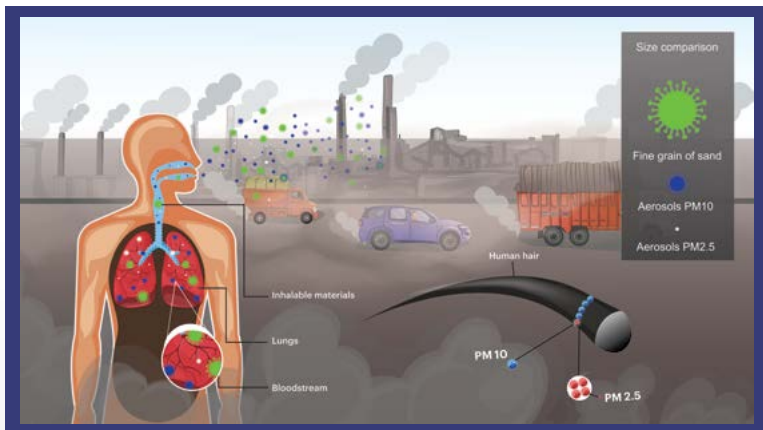
Inhalable materials

Lungs

Bloodstream

PM 10

PM 2.5



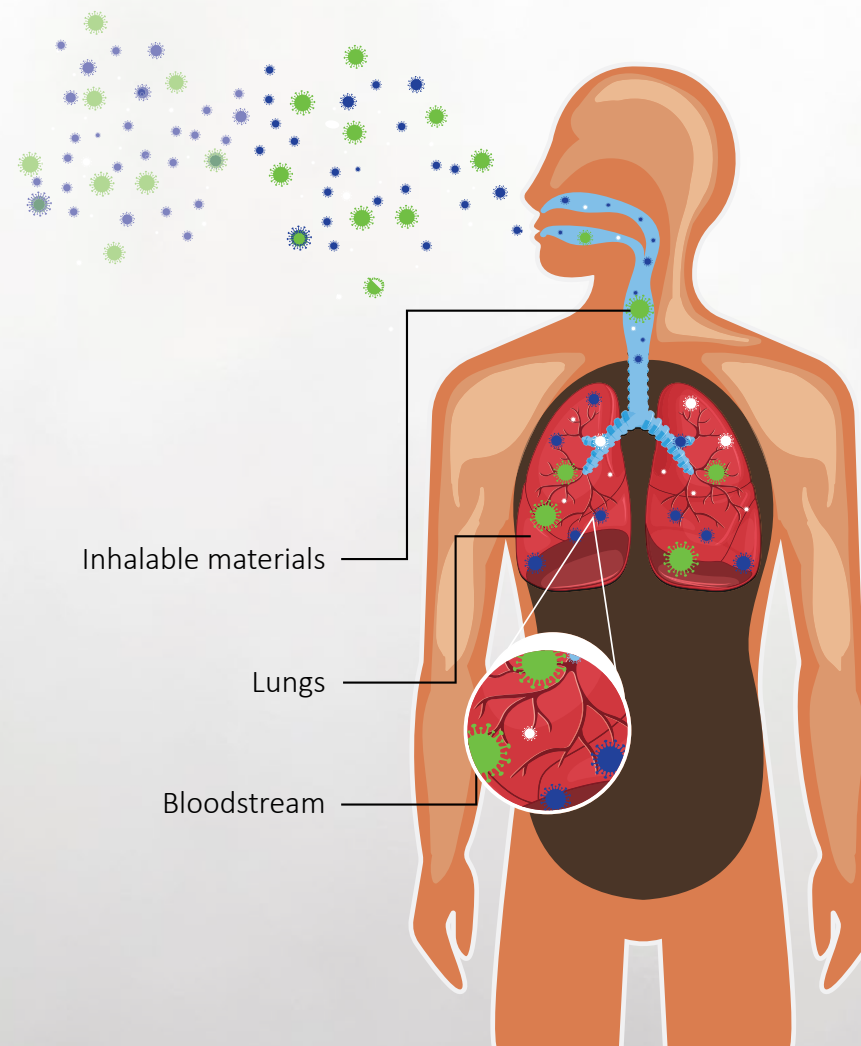
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AIR POLLUTANTS

- » Air Pollutants are present in the air as solid particles, liquid droplets or gases. These can be natural or man-made
- » If the presence of such substances is high, it can affect human health and environment

What is Particulate Matter?

- » Particulate Matter (PM) includes small solid or liquid matter in the earth's atmosphere
- » PM10 is particulate matter 10 micrometers or less in diameter
- » PM2.5 is particulate matter 2.5 micrometers or less in diameter
- » You can think of PM2.5 as fine particles. Human Hair is about 100 micrometres, so almost 40 fine particles could be placed on its width!
- » When inhaled, particles narrower than 10 micrometres can be the most hazardous as they can enter deep into your lungs, and some can also get into your blood!



3 INDOOR AIR POLLUTION



Microbes from organic materials, humidifiers, vaporizers, heating, ventilating & air-conditioning system (HVAC)

Tobacco smoking

Combustion of unclean cooking fuels like biomass, fossils and wood

Incense, mosquito coils, dhoop

Airborne particles produced from microbial, viral and fungal sources

Infectious agents produced in stagnant water, mattresses, carpets and humidifiers

Resins, waxes, polishing materials and paints, cosmetics, binder



3

INDOOR AIR POLLUTION

Air Pollution can also affect us at home and not only outdoors or at our workplace. Good Indoor air quality is essential for our health as we spend time at home or indoors

Pollutants can remain in the indoor air for long periods due to pollutants arising from household activities and changes in temperature, humidity, etc.

Sources of Indoor Air Pollution:

- » Lack of proper ventilation
- » Burning unclean cooking fuels including biomass, fossil fuel, wood, oil, gas, kerosene, coal, etc.
- » Building materials including asbestos and presence of radon in basement or underground structure of the home
- » Tobacco Smoking
- » Usage of household cleaning products
- » Storage of pesticides and other chemicals at home
- » Airborne particles produced from microbial, fungal, mold growth, etc.
- » Microbes from organic materials, humidifiers, vaporizers, heating, ventilating, and air conditioning systems (HVAC)
- » Resins, waxes, polishing materials and paints, cosmetics, binders, incense and mosquito coils, etc.
- » Infectious agents produced in stagnant water, mattresses, carpets, etc.

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OUTDOOR AIR POLLUTION



Power plant emission

Trash burning

Fuel use in factories & generators

Agricultural practices & crop burning

Construction

Building material

Vehicular emission



4

OUTDOOR AIR POLLUTION

Ambient air quality refers to the condition or quality of air surrounding us in the outdoors. Ambient Air Quality levels can worsen due to different sources of Outdoor or Ambient Air Pollution.

Sources of Ambient Air Pollution



- » Construction, building materials
- » Vehicular, industrial, power plant emissions
- » Agricultural practices including crop burning
- » Tobacco smoking
- » Waste burning
- » Fossil fuel burning & use in factories, generators etc.
- » Forest fires/wildfires

- » Dust storms
- » Suspended dust particles
- » Pollen grains
- » Bursting firecrackers
- » Solid waste incineration plants

Did you Know?

According to WHO, this type of pollution was estimated to cause 4.2 million premature deaths worldwide worldwide in the year 2016 in both urban and rural areas

5 UNDERSTANDING AND USING AQI INFORMATION

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)	May cause <ul style="list-style-type: none"> minor breathing discomfort in vulnerable population* 	No special precautions	Do less prolonged or strenuous outdoor physical exertion
Moderate (101-200)	May cause <ul style="list-style-type: none"> breathing or other health discomfort in vulnerable population* 	Do less prolonged or strenuous outdoor physical exertion	Avoid prolonged or strenuous outdoor physical exertion
Poor (201-300)	May cause <ul style="list-style-type: none"> breathing discomfort in healthy people on prolonged exposure breathing or other health discomfort in vulnerable population* on short exposure 	Avoid outdoor physical exertion	Avoid outdoor physical activities
Very Poor (301-400)	May cause <ul style="list-style-type: none"> 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)	May cause <ul style="list-style-type: none"> 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



AQI Monitor



Check Website/App for Central Pollution Control Board (CPCB): (https://app.cpcbcr.com/AQI_India/) or System of Air Quality and Weather Forecasting And Research (System of Air Quality and Weather Forecasting and Research (SAFAR), Ministry of Earth Sciences (MoES), Govt. of India: (<http://safar.tropmet.res.in/>)

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Source: Central Pollution Control Board



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UNDERSTANDING AND USING AQI INFORMATION

The Air Quality Index is a helpful tool that can help you to understand the quality of air. You can use it to plan your day especially during peak pollution periods. It also explains possible health effects of the air pollution that may be affect you according to the area you live in

This tool is especially useful for members of vulnerable population who are at high risk of harmful health effects of air pollution including the elderly, children under 5 years, pregnant women and people with pre-existing illnesses such as asthma and other airway or lung diseases, heart and blood vessel diseases, or any other illness aggravated or caused by air pollution

How to use the AQI tool?

You can imagine the AQI tool as a personal Traffic light. Before stepping out of your house, make sure to check the traffic light by following these steps



Red: STOP: Check the AQI for the day and area

- » Check the AQI of the day for your area and city for the day from the recommended official GoI websites
- » You can download the apps or visit the websites for Central Pollution Control Board (CPCB): (https://app.cpcbcr.com/AQI_India/) or System of Air Quality and Weather Forecasting And Research (System of Air Quality and Weather Forecasting and Research (SAFAR), Ministry of Earth Sciences (MoES), Govt. of India: (<http://safar.tropmet.res.in/>). In case of lack of availability of internet/smartphone services, you can also refer to the news
- » Before planning any activities for the day or leaving the house, identify the air quality category to see how severely polluted the air is on that day

Orange: PAUSE: Check the health risks

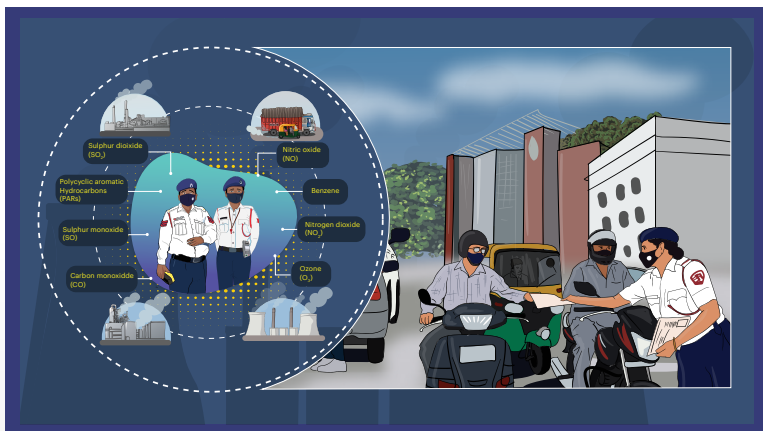
- » Find out the health advisory you need to follow for the day in order to minimize your exposure and reduce chances of falling ill. If you are vulnerable to health effects of air pollution, recognise the risks and take precautionary measures to protect yourself

Green: GO: Follow advisory for daily activities

- » Plan your day and try to follow the advisory for permissible activities according to the AQI category

OCCUPATIONAL HAZARDS



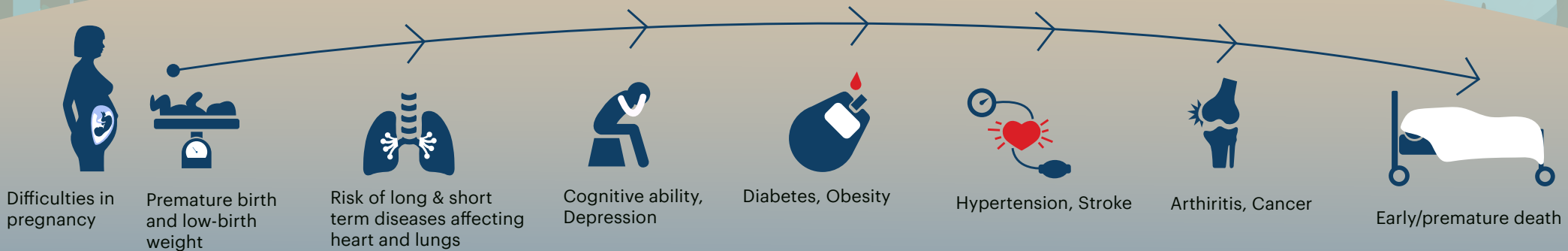
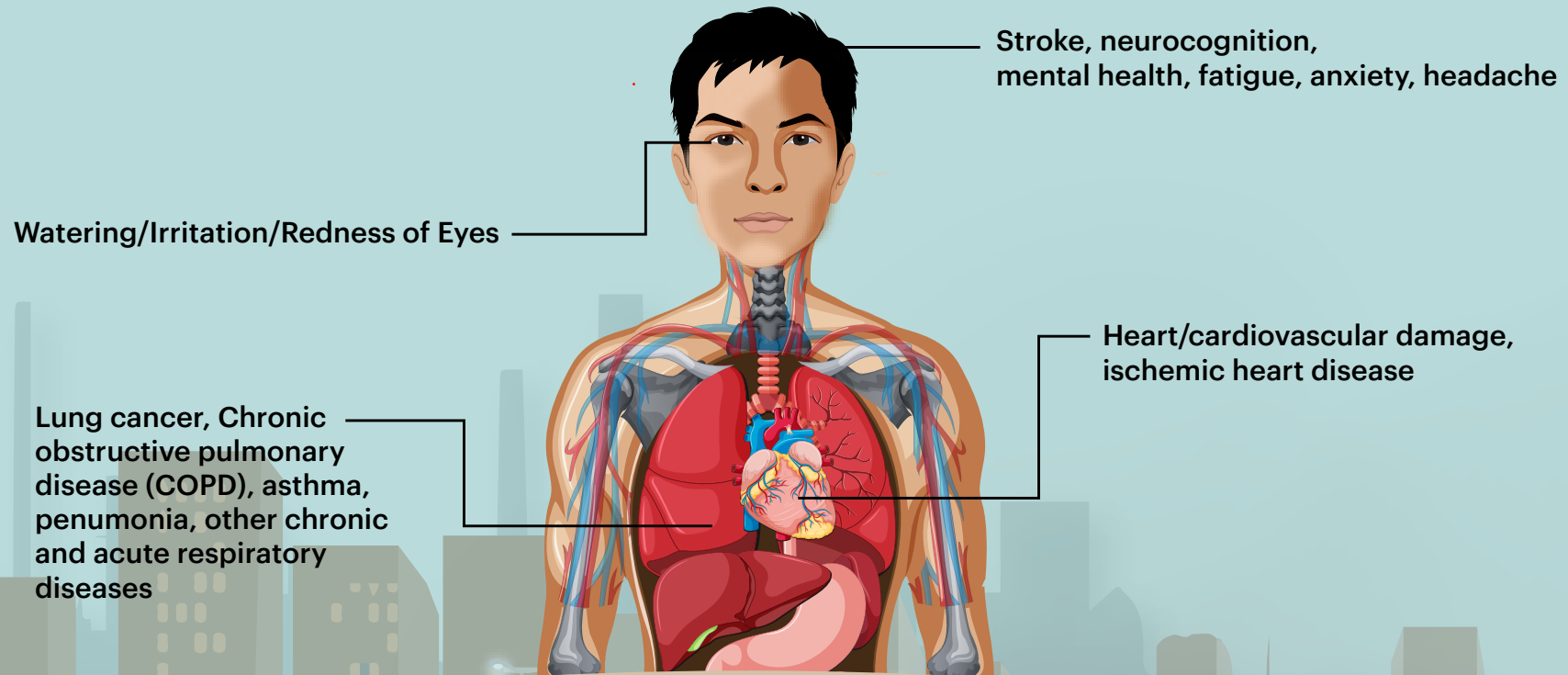


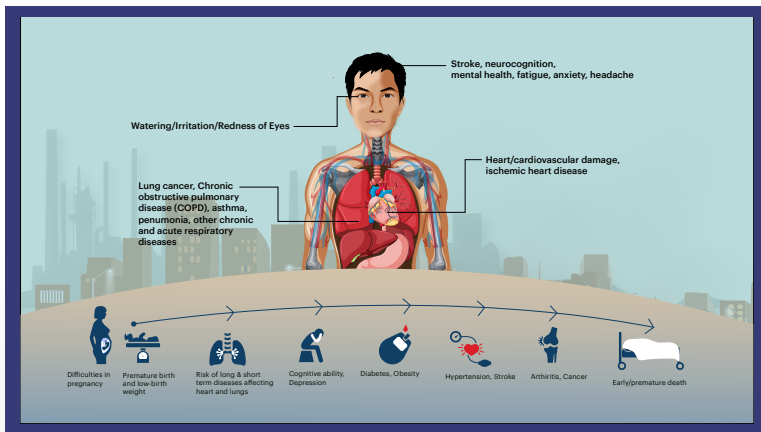
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OCCUPATIONAL HAZARDS

- » Vehicles contribute to pollution through chemicals (carbon monoxides and oxides of nitrogen etc.) released from exhaust pipes, etc.
- » Traffic jams, congestion, slow-moving traffic can lead to increase in vehicular pollution and emissions. This negatively impacts air quality and threatens health of police personnel deployed at traffic signal or those regulating traffic, drivers, commuters and those residing next to main roads, etc.
- » Older vehicles with old technology and parts, especially diesel vehicles, e.g., bigger trucks, bulldozers, etc. are more polluting
- » Diesel vehicles are likely to cause more pollution and pose hazards to health since Diesel is classified as class 1 carcinogen (cancer-causing)
- » Re-suspended road dust like deposits of vehicle and industrial exhausts, particles from tyre and brake wear, dust from paved roads or potholes, construction sites, open unpaved parking spaces
- » Other climate-related risks like excessive exposure to heat and cold, heavy rain, wind, solar UV and allergenic pollens while at work
- » Common air pollutants that you may be exposed to while working outdoors are Carbon monoxide, Nitrogen dioxide, Nitric oxide, ground level Ozone, Lead, Sulphur dioxide, Benzene, Polycyclic aromatic Hydrocarbons (PARs), Particulate Matter, etc.

7 HEALTH EFFECTS OF AIR POLLUTION

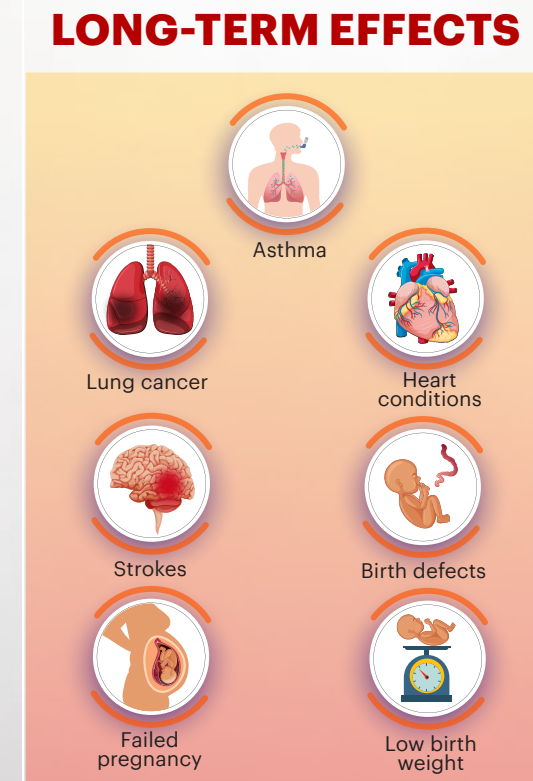
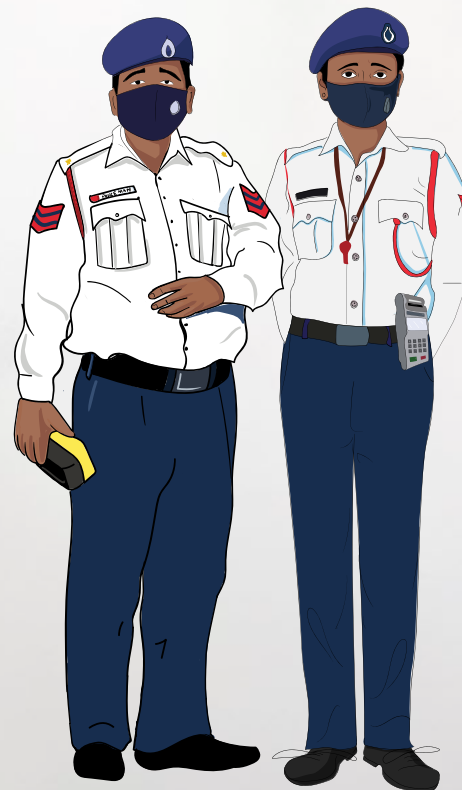




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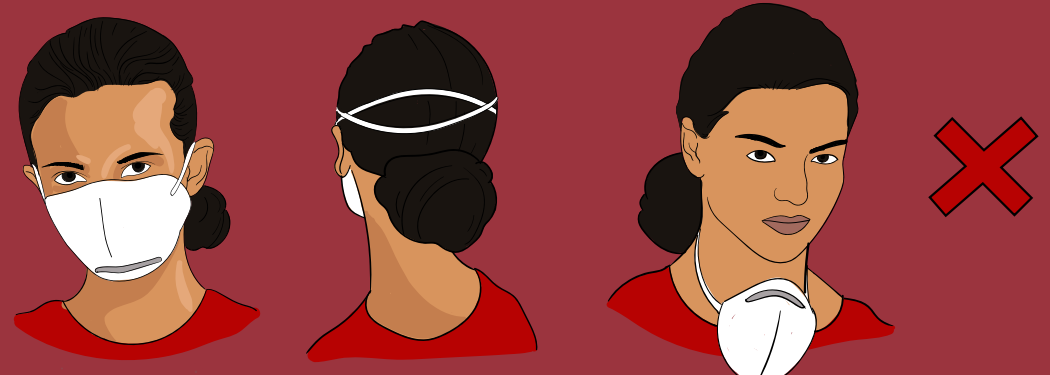
HEALTH EFFECTS OF AIR POLLUTION

Air Pollution can affect your health in the short term and long term. It can not only impact you across your entire lifecycle but also that of future generations of your family!



8

CALL TO ACTION: WHAT CAN I DO TO MINIMISE MY EXPOSURE?





8

CALL TO ACTION: WHAT CAN I DO TO MINIMISE MY EXPOSURE?

- » Go for medical check-ups regularly to check if you have any pre-existing health conditions or respiratory diseases, etc.
- » The impact of exposure to air pollution can be more severe for those who have lung and heart diseases such as asthma, COPD, cardiovascular diseases (risk of heart attack and stroke). If you have such an illness, try to keep your medications available with you
- » Seek medical help if you experience breathlessness, giddiness, cough, chest discomfort or pain, irritation in eyes (red or watering)
- » Wear N95 or N99 masks correctly to cover nose and mouth especially during winter months and early morning working hours to protect from air pollutants, dust, etc.
- » If you choose to use face mask, the disposable N95 or N99 is useful provided user instructions are followed
- » Paper and cloth masks are not as effective
- » Nose clip of the mask must be adjusted to fit the face. Ensure that the size is appropriate for your face and air only passes through filter attached at the front
- » Please remember to replace the mask as per the advisory on the mask

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CALL TO ACTION: WHAT CAN I DO TO MINIMISE MY EXPOSURE?





9

CALL TO ACTION: WHAT CAN I DO TO MINIMISE MY EXPOSURE?

Do's

- » Wear personal protective equipment (PPE) during work hours including appropriate shoes, gloves, for overall body protection
- » Check AQI for place of work and try to follow health-activity advisory
- » Take more stringent actions if polluting vehicles are on the road
- » Attend any community trainings/workshops organised on air pollution to learn about implementing protective measures

Don't s

- » Do not skip wearing PPE & masks at work during early morning and late evening hours especially during winters, peak air pollution season, dust storms, etc.
- » Do not forget to emphasize the importance of pollution certificates of vehicles
- » Do not smoke cigarettes or consume tobacco related products
- » Do not mix or use PPE used at work with household clothing/ items as they may have traces of toxic pollutants, etc.

CALL TO ACTION: HOW CAN WE REDUCE OUR CONTRIBUTION TO POLLUTION?





10

CALL TO ACTION: HOW CAN WE REDUCE OUR CONTRIBUTION TO POLLUTION?

As Traffic Police Personnel, you play a leadership role to ensure smoother traffic movements, to reduce air pollution which is not only beneficial for you but also for people as well. Along with your professional responsibilities, you can participate in community action to reduce air pollution and raise awareness about harmful health effects

- » Proactively take up all possible mechanisms to reduce traffic congestions like functional traffic lights and others, etc.
- » Discourage violations of traffic laws, practices such as engine idling: as well as transfer of uncovered construction material, garbage, etc.
- » Encourage family and friends to stop use of solid fuels, biomass, etc. and switch to using renewable energy resources and cleaner energy sources
- » Promote walking, cycling and public transport. However, avoid any strenuous exercise during peak pollution hours as this may affect your health negatively

- » Scale up green initiatives like planting of trees and preserve green surroundings especially near roads, Traffic Police Station and other uncovered non-vegetated areas

EVERY COMMUNITY ACTION COUNTS, TAKE A STEP TO REDUCE AIR POLLUTION



This training manual for Community Level Training on air pollution and its health effects on Traffic Police Personnel will help to develop Trainers at various levels in the States/UTs under the NPCCHH programme to enable them in reaching an increase awareness level on the sources of air pollution to Traffic Police Personnel, health impacts due to air pollution and better adaptation ways to protect and prevent their health effects due to air pollution in the States/UTs in the country.

