सत्यमेव जयते
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 Municipal Workers

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

MINISTRY OF HEALTH AND FAMILY WELFARE
GOVERNMENT OF INDIA
2020

सत्यमेव जयते

राष्ट्रीय रोग नियंत्रण केंद्र
स्वास्थ्य सेवा महानिदेशालय
स्वास्थ्य एवं परिवार कल्याण मंत्रालय भारत सरकार

National Centre for Disease Control (NCDC)
Directorate General of Health Services (DGHS)
Ministry of Health and Family Welfare
Government of India

डॉ. सुजीत कुमार सिंह
निर्देशक, राष्ट्रीय रोग नियंत्रण केंद्र

Dr Sujeet Kumar Singh
Director, NCDC

PREFACE

Municipal workers are the important group of frontline workers during the COVID-19 pandemic times. They are vital group of professionals in our society who help clean our streets in the urban and city areas in the country and keep these areas moving. As outdoor professionals in the urbans and cities where air pollution is relatively at higher level in the country, they are continuously exposed to outdoor air pollution which is a known environmental health risk. So, they are more likely to suffer from negative health impacts like irritation of our external organs such as eyes and skin and also, our main internal organs of our human body like respiratory problems, cardiovascular problems etc. Various study reports also have shown of the positive correlation between air pollution and health of municipality workers. Therefore, health adaptive measures need to be taken up to protect and prevent municipality workers 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 Municipality Workers' 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 other adapting measures to protect and prevent this vulnerable group of municipality workers. The municipal corporations in the States/UTs can also preferably 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 Municipality Workers " will help protect and improve the health of municipality workers who safeguard us by keeping our streets clean in the urban and city areas in the country and keep these areas moving.

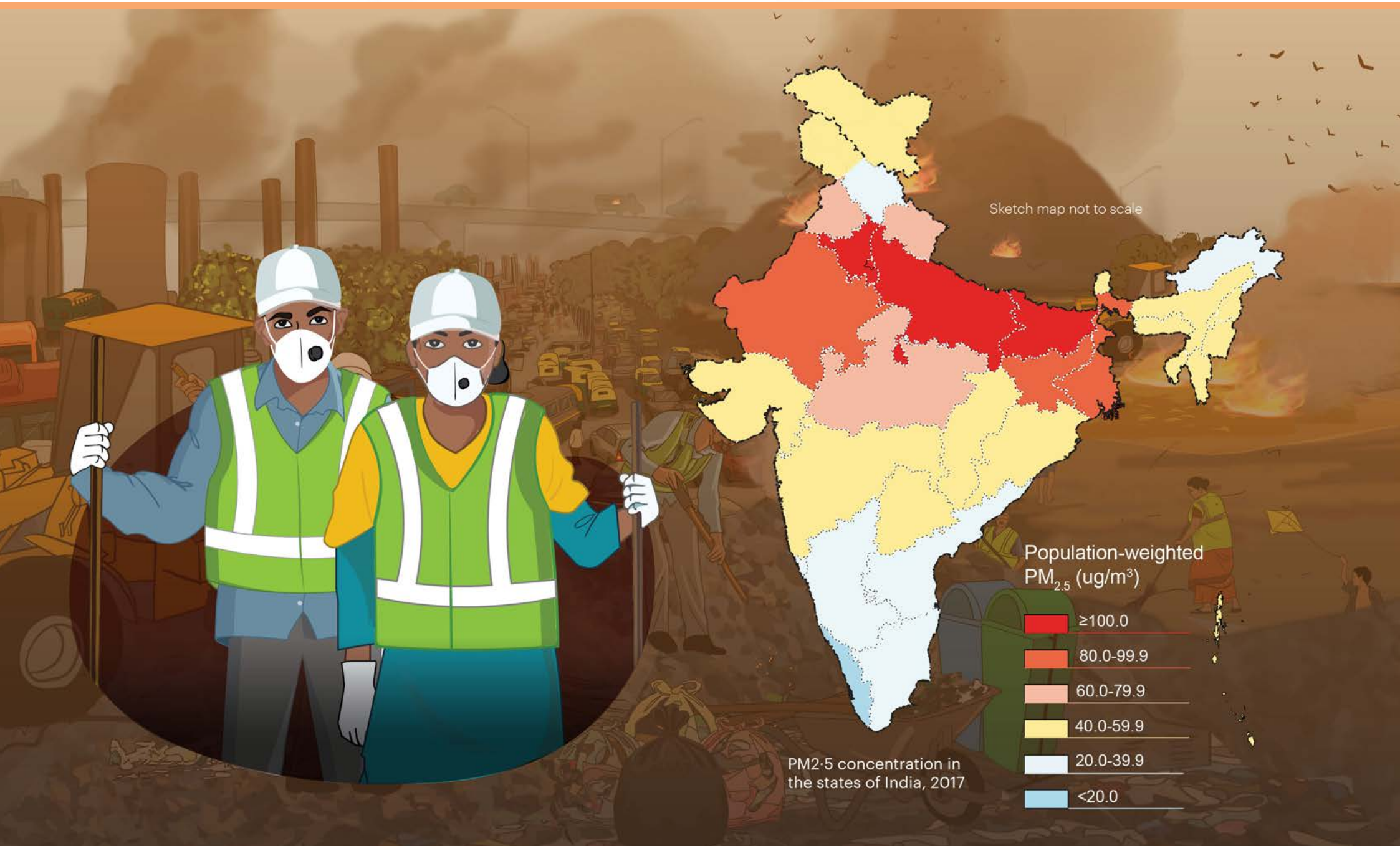
I laud efforts from all others who take part in making this manual an invaluable document for the programme.

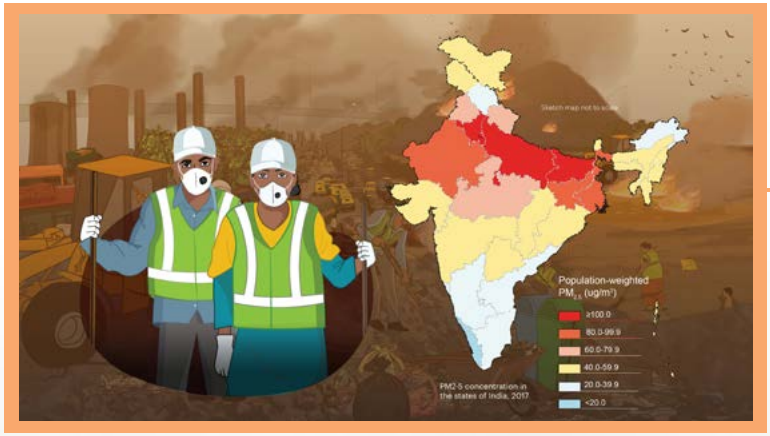
(Sujeet K. Singh)

निर्देशक

Director

1 AIR POLLUTION





1 AIR POLLUTION

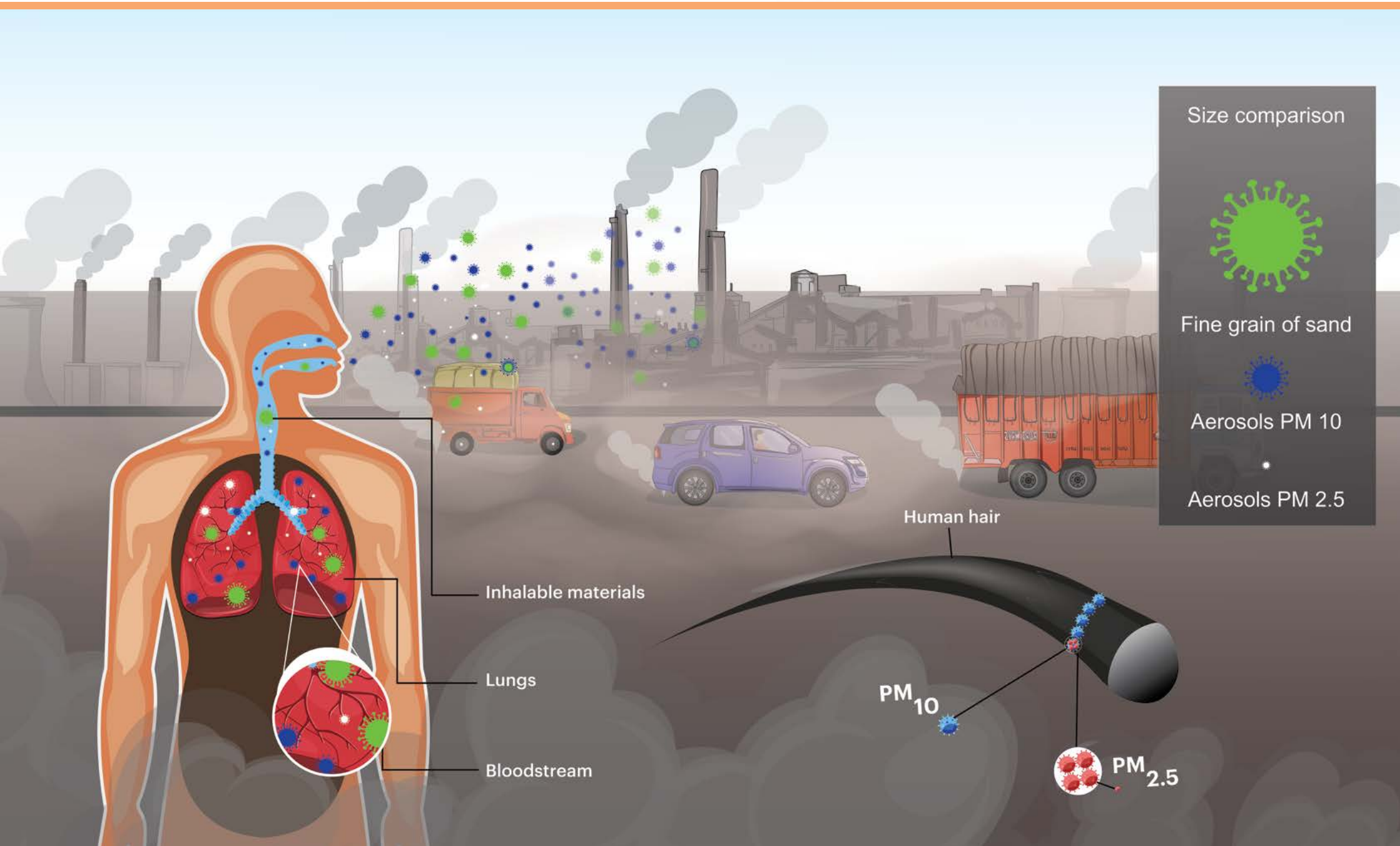
Air pollution is the contamination of the indoor or outdoor environment by any chemical, physical or biological agent that change the natural state of the atmosphere

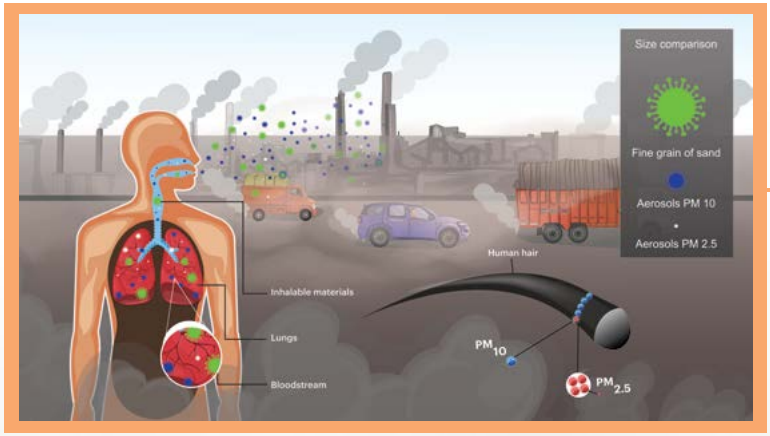
- Clean Air is a human right and it is important for a safe environment and also for your health
- Benefits of Clean Air: Healthier lungs, better neurocognitive status, fewer illness and deaths related to lung and heart diseases, healthier nature and environment
- Threats from Polluted Air: negative 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 µg/m3 in 2017. Most states and about 76.8% of the population of India, were exposed to PM2·5 greater than 40 µg/m3 approximately, which is the limit recommended by the National Ambient Air Quality Standards in India

2 AIR POLLUTANTS



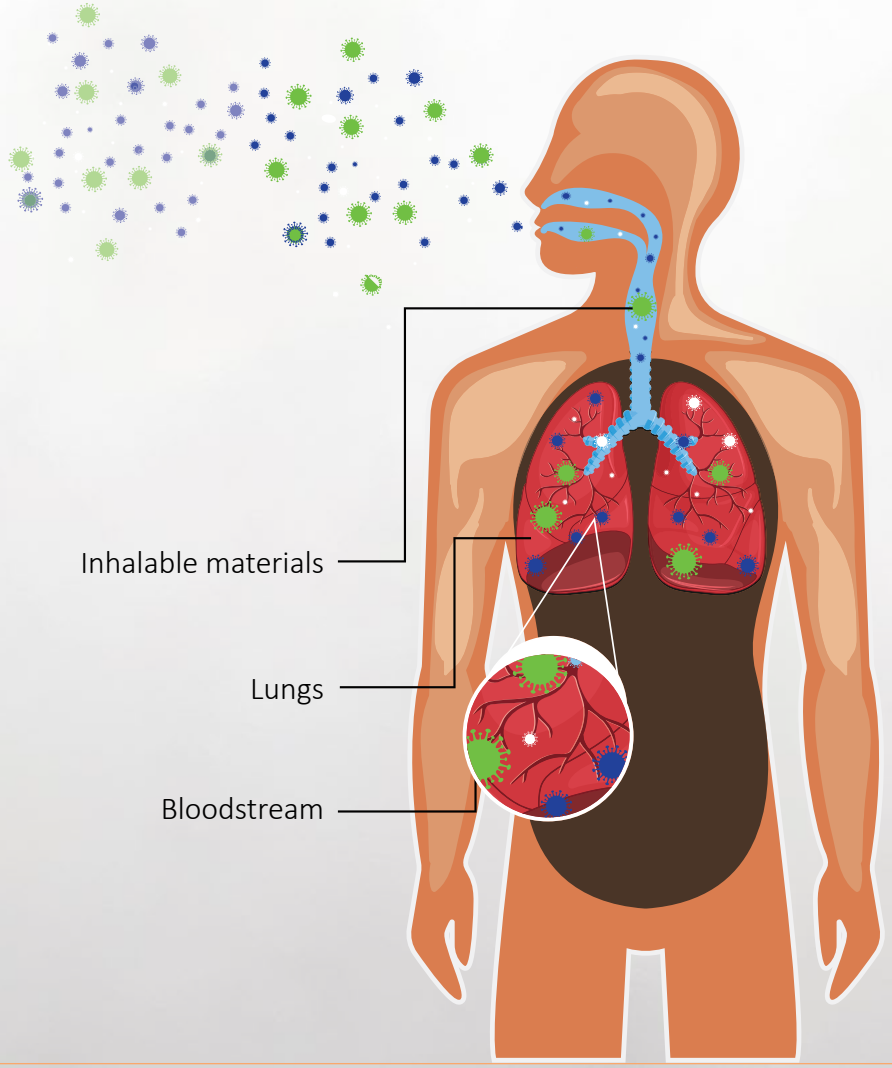


2 AIR POLLUTANTS

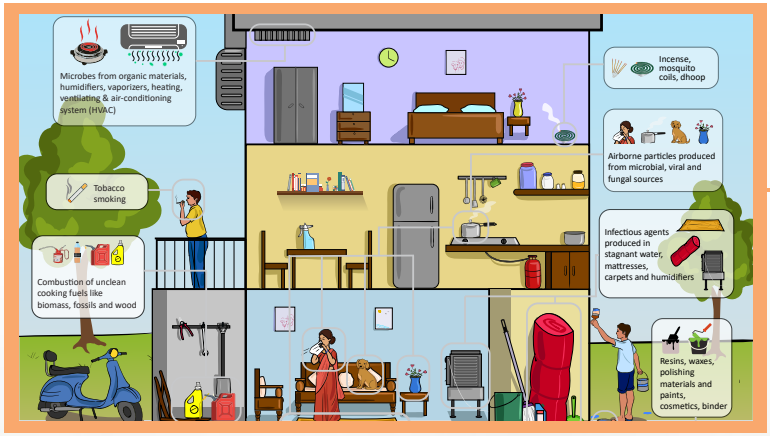
- Air Pollutants are present in the air as solid particles, liquid droplets or gases. These can be natural or man-made
- If the presence of such substances is high, it can affect human health and environment

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



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 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.

4 OUTDOOR AIR POLLUTION

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 • minor breathing discomfort in vulnerable population*	No special precautions	Do less prolonged or strenuous outdoor physical exertion
Moderate (101-200)	May cause • 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 • 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 • 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 • 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

Source: Central Pollution Control Board

AQI Monitor

Check Website/App for Central Pollution Control Board (CPCB): (https://app.cpcbccr.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/)

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 • minor breathing discomfort in vulnerable population*	No special precautions	Do less prolonged or strenuous outdoor physical exertion
Moderate (101-200)	May cause • 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 • 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 • 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 • 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.cpcbccr.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/)

Source: Central Pollution Control Board

5

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.cpcbccr.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

6 OCCUPATIONAL HAZARDS

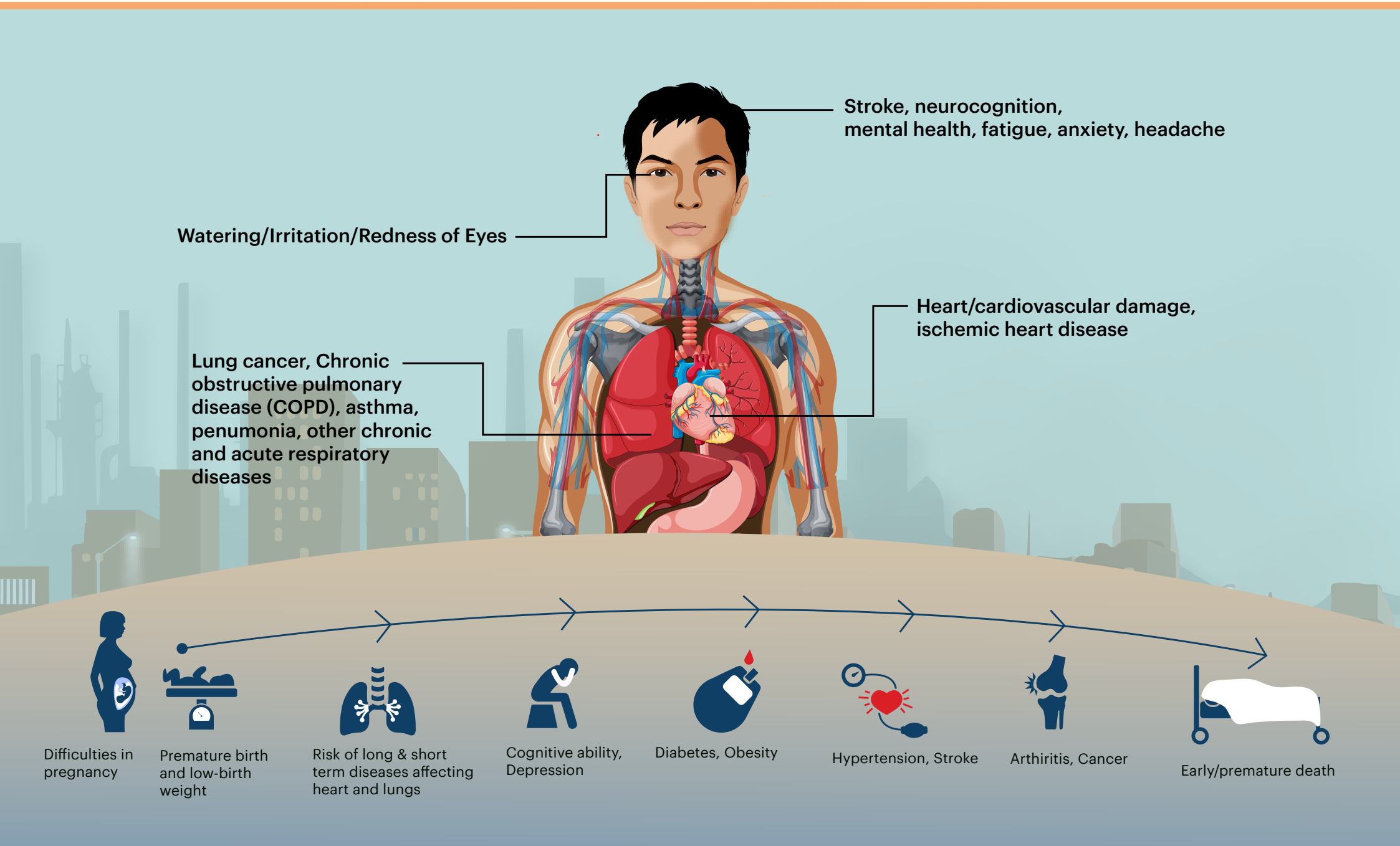
6

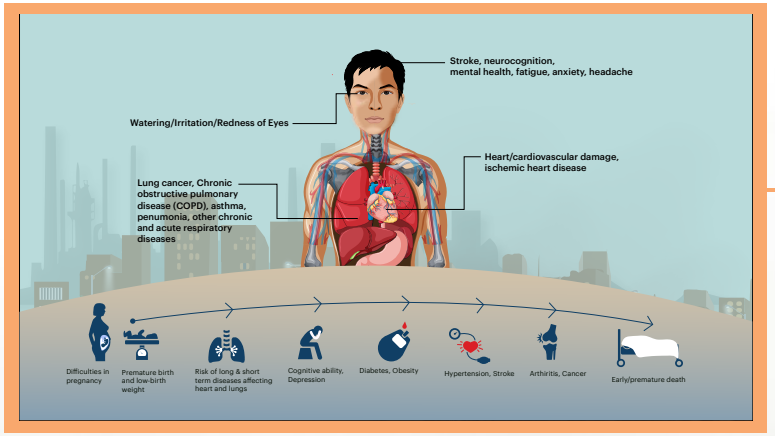
OCCUPATIONAL HAZARDS

Occupational hazards from work activities

- Fumes, particles, fibres, toxic chemicals are released during activities related to waste collection and segregation
- Waste burning releases dangerous carcinogens like dioxins, furans and black carbon which cause health issues and contribute to climate change
- Vehicular traffic like cars, big trucks, bulldozers, etc. release carbon monoxide, nitrogen oxides, etc.
- 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, Polyclic armoatic Hydrocarbons (PARs), Particulate Matter, etc.

7 HEALTH EFFECTS OF AIR POLLUTION

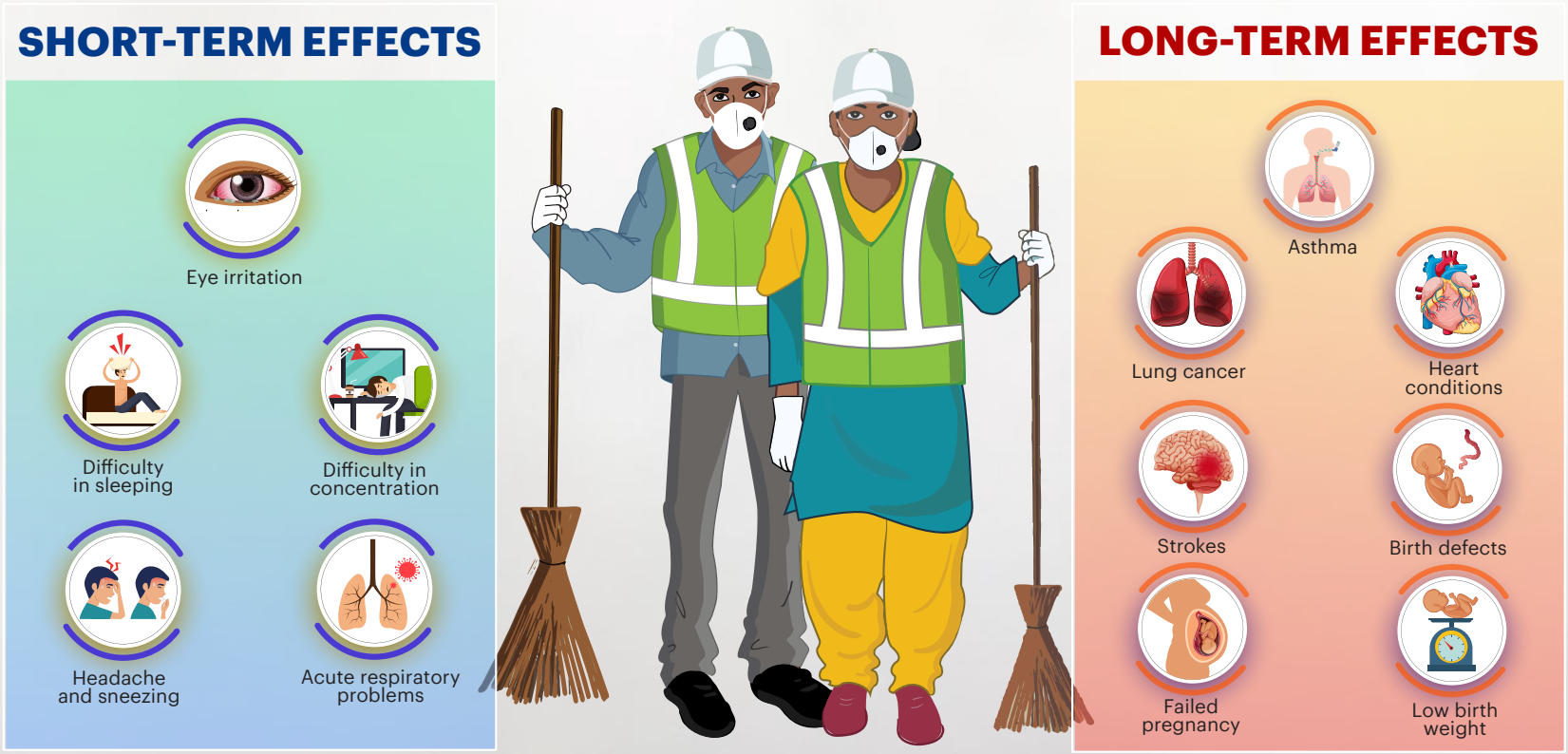




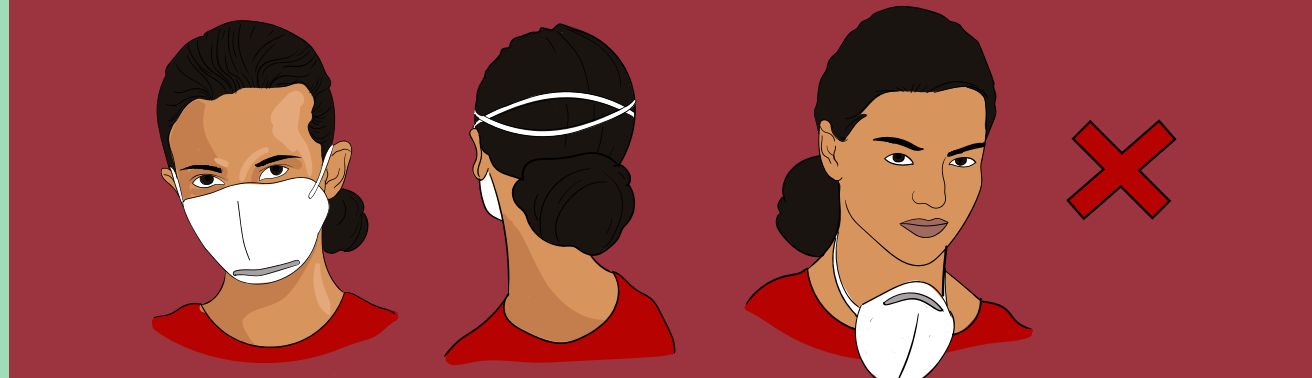
7

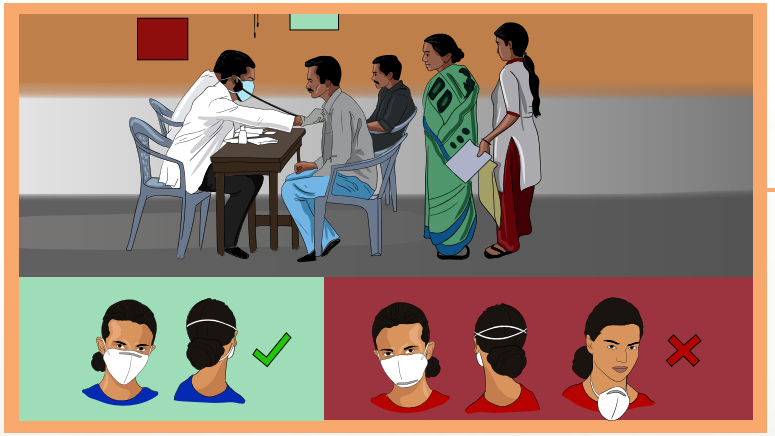
HEALTH EFFECTS OF AIR POLLUTION

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

9 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
- Always follow safe measures to collect, segregate and dispose waste
- 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 engage in open burning of waste (including unsegregated waste, plastic, leaves, e-waste etc.) and agricultural residues
- 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.

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

10

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

As Workers, you can participate in community action to reduce air pollution and raise awareness about harmful health effects

- Advocate for waste reduction, separation, processing, management, recycling and reuse at the household or community level
- Discourage open burning of solid waste materials such as plastics, e-waste or crop residue etc. in your neighbourhood or burning of waste as a source of heat during winters
- 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, and other uncovered non-vegetated areas

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

This training manual for Community Training on Air Pollution and its Health Effects on Municipal Workers will help to develop Trainers at various levels in the States/UTs under the NPCCHH programme to enable them increasing the awareness level on increased health vulnerability of exposure to air pollution, sources of air pollution to them, health effects due to air pollution and better adaptation measures to protect and prevent their health effects due to air pollution.

PUBLIC HEALTH FOUNDATION OF INDIA

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

Ministry of Health & Family Welfare
Government of India

NATIONAL HEALTH MISSION

National Programme on Climate Change and Human Health

World Health Organization
COUNTRY OFFICE FOR India