



Environmental Health

Air Sanitation



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Environment

- All the external factors, living and non-living, which surround man.



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The Kingdom of Saudi Arabia will host the 2024 World Environment Day global celebrations.

Components of external environment:

They are **all closely related**:

1. **Physical**: water, air, soil, housing, wastes, noise, heat, radiation, etc.
2. **Chemical**: e.g. air pollutants, metals, tobacco smoking, etc.
3. **Biological**: Plant and animal life including bacteria, viruses, insects, rodents.
4. **Social**: Customs, culture, habits, income, occupation, religion etc.

Components of environmental Sanitation:

- Town planning.
- Housing and ventilation.
- Air sanitation.
- Water sanitation.
- Food sanitation.
- Waste disposal.



Air Pollution

The presence of substances in the **surrounding atmosphere** e.g., gases, mixtures of gases and particulate matter) generated by the activities of man in concentrations that interfere with human health, safety, comfort or injurious to vegetation and animals and other environmental media.

Outdoor air pollutants



Criteria pollutants

Include primarily combustion – related pollutants (sulfur dioxide [SO₂], nitrogen dioxide [NO₂], carbon monoxide [CO], and particulate matter). The secondary pollutants are ozone and lead.



Hazardous pollutants



- Such as asbestos,
- Industries and waste products

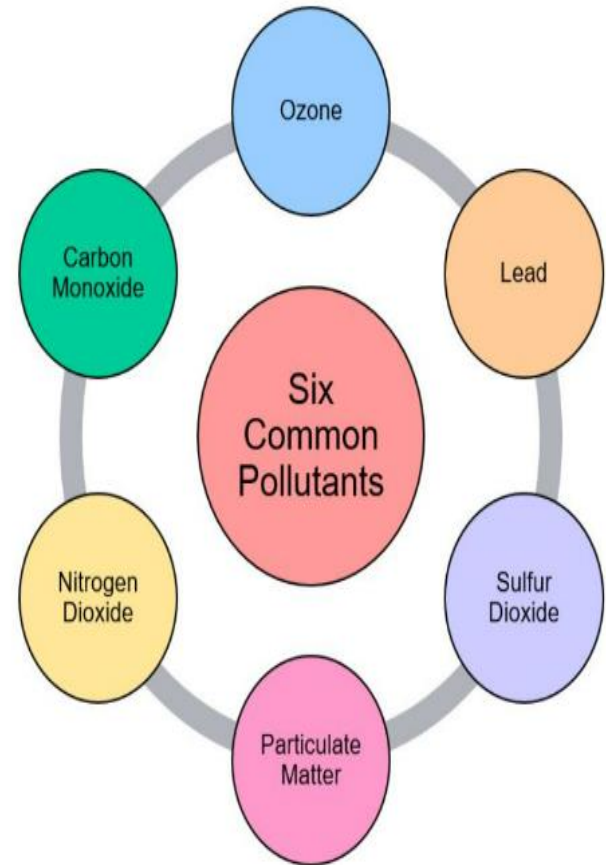
The criteria pollutants

primarily
pollutants

- SO₂
- CO
- NO₂
- particles

secondary
pollutants

- Ozone
- Lead.



Air pollution indicators

used for air monitoring

Sources of air pollution

- **Automobiles.**
- **Industries.**
- **Domestic sources:** Domestic combustion of **coal, wood or oil** is a major source of smoke, dust, sulfur dioxide and nitrogen oxides.
- **Tobacco smoke:** Those who don't smoke may inhale the smoke produced by others (passive smoking).
- **Miscellaneous:** **burning refuse, pesticide spraying, nuclear energy,....,etc**



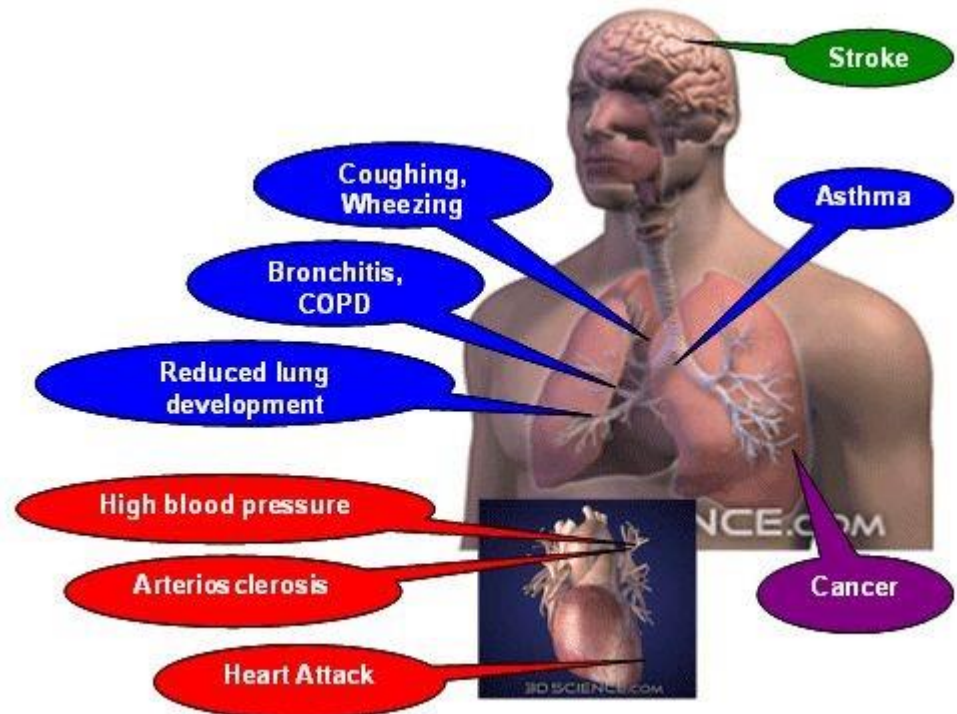
Hazards of air pollution

1-Health aspects:

Immediate

Delayed

2-Social and economic aspects



Health effects of air pollution

short-term effects

exacerbation of asthma

cough, wheezing and shortness of breath

episodes of high air pollution increase respiratory and cardiovascular hospital admissions and mortality

long-term effects

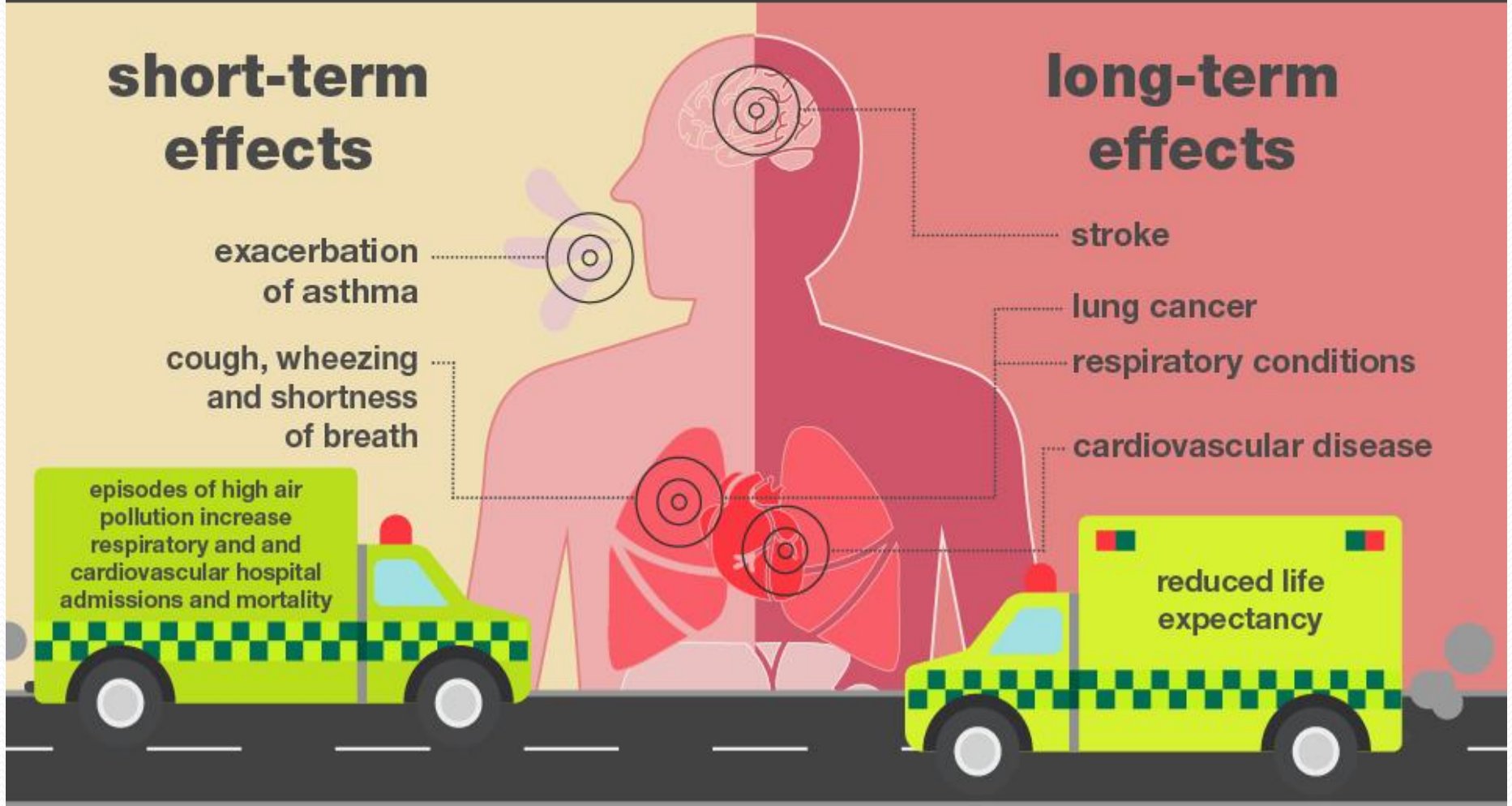
stroke

lung cancer

respiratory conditions

cardiovascular disease

reduced life expectancy



Environmental, Social and economic aspects

- Destruction of plant and animal life,
- Cost of cleaning and maintenance and repairs,
- Reduces visibility in towns.



Air pollution episode

- Definition: environmental chemical disaster due to air pollution.
- They may be acceptable under normal weather conditions, but under certain conditions (temperature inversion, fog, ... etc), concentration of pollutants increase to dangerous levels causing health effects on a large scale.

London (UK)

- London, situated in Thames valley, experienced its worst air pollution episode due to fog from 5th to 9th December 1952.

Because of excessive use of coal as a fuel for space heating and electricity production, the particulate and sulfurdioxide levels in the atmosphere increased. The white fog becomes a black smog.

■ FOG

- ✓ Fog is formed when moist air is cooled
- ✓ Disperse light and reduce visibility
- ✓ Visibility less than 1000 meters

■ SMOG

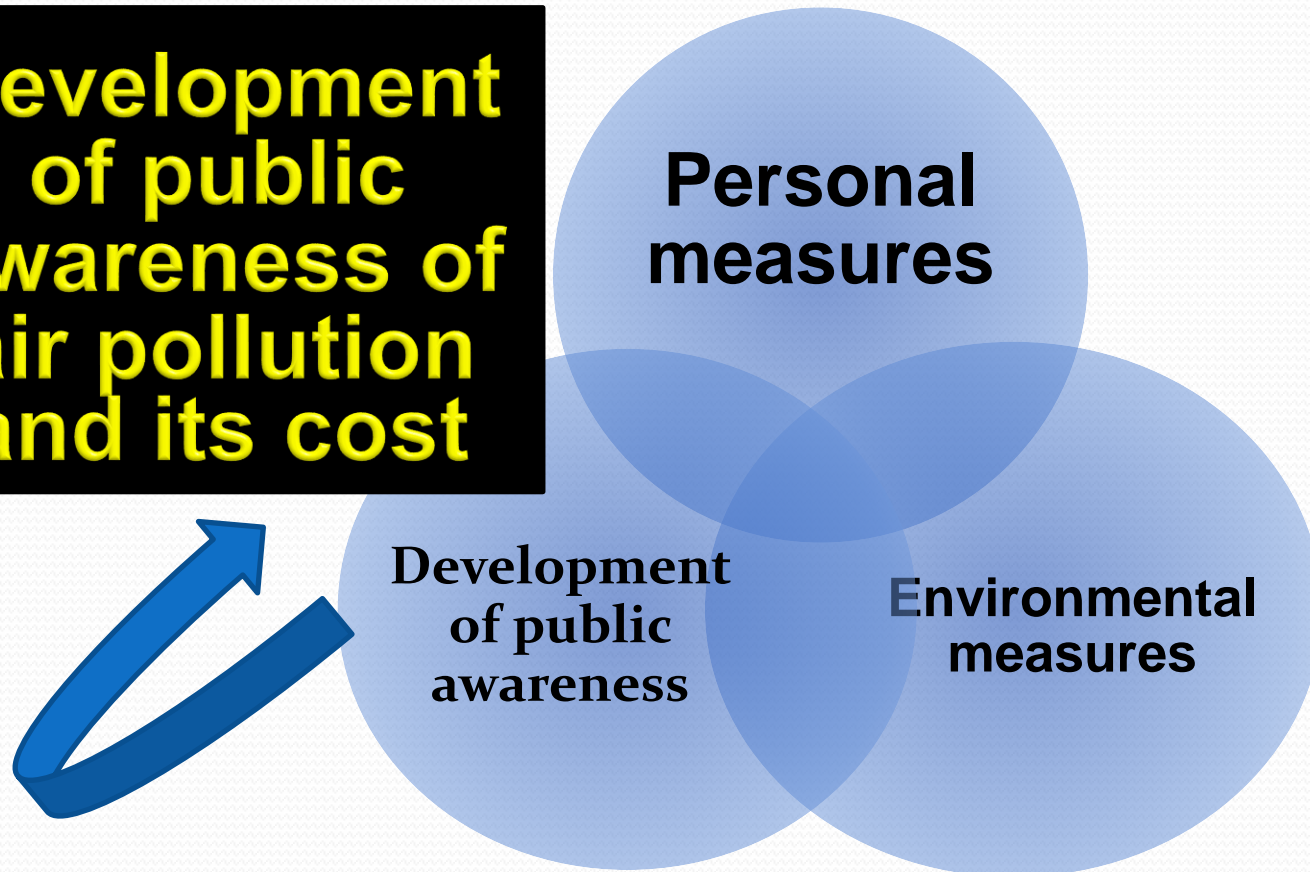
- ✓ Formed when organic compounds and nitrogen oxides chemically react with sunlight
- ✓ Cause choking coughing and other health problems



- Smoke concentration was found five times more than those found other times while concentration of sulfur dioxide was six times the usual level, resulted in practically zero visibility.
- The symptoms were cough, nasal discharge, sore throat, irritation of eyes and bronchi, and sudden attack of vomiting.
- Most of people who died were old and those who had histories of chronic bronchitis, asthma, broncho pneumonia and other lung or heart disease. The excessive problems were caused by irritation of respiratory track. This disaster caused over 4000 deaths.

Prevention and control of air pollution

Development of public awareness of air pollution and its cost



1) Personal measures (during episodes)

1-Patient – Oriented

- To stay **indoors**
- To **avoid vigorous exercise outdoors**
- The **use of medications** should follow the usual clinical indications.
- The use of **respiratory protective equipment**.

2-Community – Oriented control:

- Prepare daily air quality summaries, which are disseminated to the media.

2-Environmental measures

1. Containment: (prevention of escape of toxic substances into the ambient air). by placing a barrier between the hazard source and the work environment . Containment can be achieved by a variety of engineering methods such as **air cleaning device** and **exhaust fan**.



2. **Replacement:** E.g. reduce lead in petrol, use more **renewable energy, electric cars, natural gas.**

3. **Dilution:** by “**green belts**”.



4. **Legislation:** Height of chimneys
مداخن, creation of smokeless zones,
enforcement of standard for ambient
air quality معايير جودة الهواء.

5. **Monitoring:** by pollution indicators.

