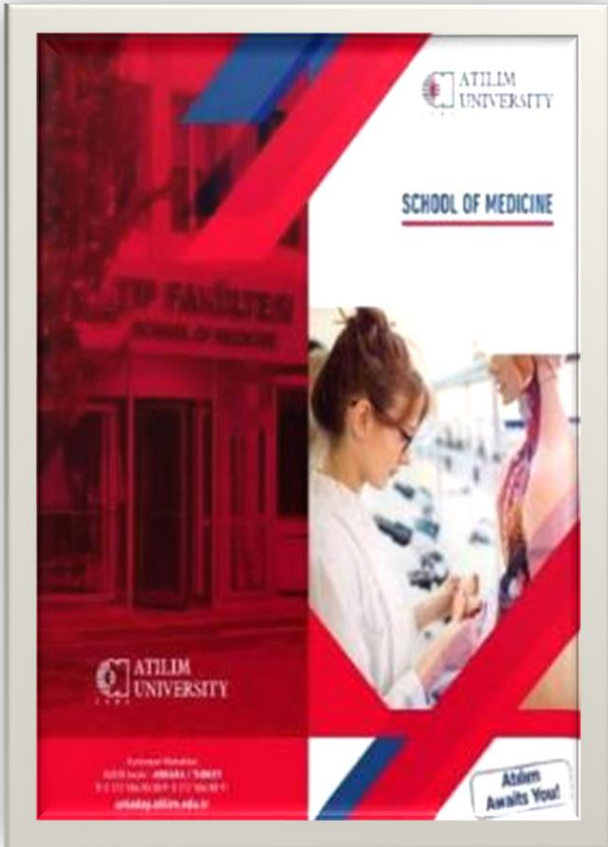


# Management of Work Related & Occupational Diseases Caused by Worksite Air



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*BSc, in Public Administration & Political Sciences*

## **The Universal Declaration on Human Rights (UDHR)**

proclaims that everyone has the right to **work**, to free choice of employment, to just and favorable conditions of work and to protection against unemployment. **(Art. 23)**

\*\*\*

All of the 3.5 billion workers in the world have the right to breathe clean air at their workplaces, as well as at their homes, cities and villages.

[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

*Phase 3 lecture, 2023 - 2024  
academic year, spring semester*

**14th March 2024, Ankara - TURKIYE**

[www.ahmetsaltik.net](http://www.ahmetsaltik.net)

# Learning objectives....

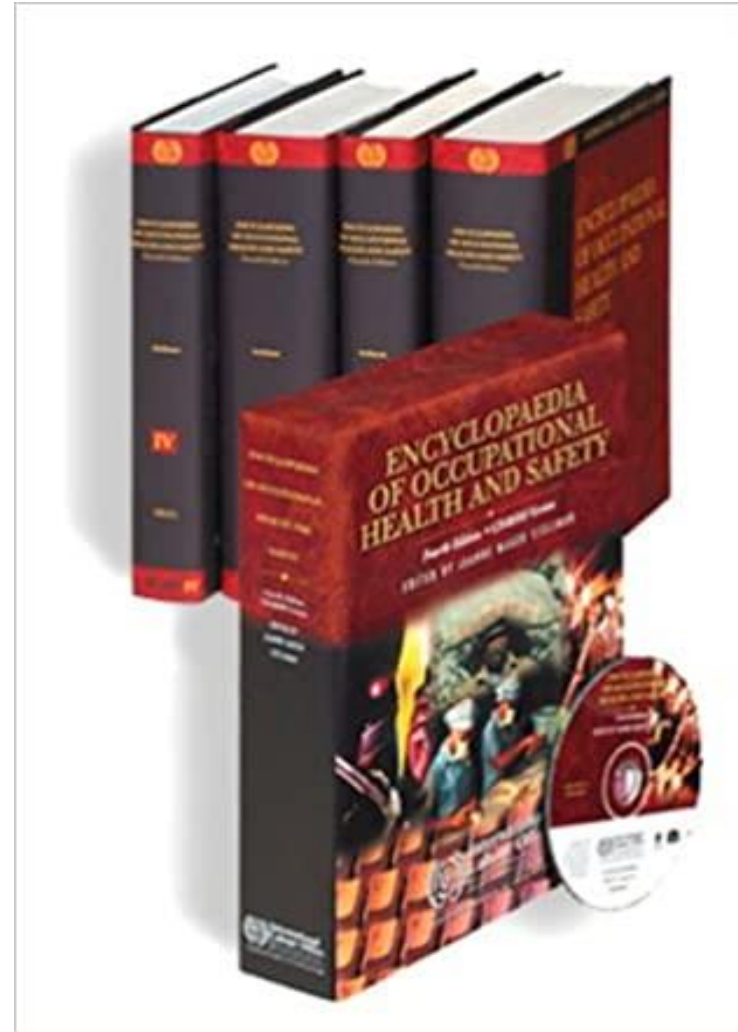
**At the end of this lecture, students are expected to :**

- **Describe** occupational / work related disease (OD-WRD),
- **Conceive** *the importance OD-WRD in public health*
- **Understand** the pathogenesis of OD-WRD at worksite
- **Explain** *how to prevent workforce from OR-WRD*
- **Realise** how to promote workforce
- **Develop** *an idea about statistical dimensions of OD-WRD*
- **Define** colossal amount of disease burden (**DALY-QUALY**, morbidity-mortality-disability) due to OD-WRD on manpower and how to manage it.



# Definition of Occupational Health

- ❖ **Occupational health** practice encompasses the activities of all those who contribute to the **protection and promotion of workers' health-PP** and to the improvement of working conditions and environment;
- ❖ *These terms should not be understood as merely the practice of occupational health professionals.*
- ❖ The institutionalized organizational arrangements to provide such services (i.e., the occupational health services which are part of the infrastructure to **protect and promote workers' health**).



# Legal Definition of Occupational Disease

- ❖ **Occupational disease** is defined in *the Social Insurance and General Health Insurance Law No. 5510* as a temporary or permanent illness, physical or mental disability that the insured is exposed to due to a recurring reason due to the nature of his work or due to the operating conditions of the work. (Art. 14)
- ❖ *The material and moral losses that occur as a result of occupational diseases that are completely preventable have reached significant dimensions, especially in developing societies.*



# Classification of Occupational diseases-1

**Occupational diseases** by target organ systems

## 2.1. Respiratory diseases

2.1.1. Pneumoconioses caused by fibrogenic mineral dust  
(*silicosis, anthraco-silicosis, asbestosis*)

2.1.2. Silicotuberculosis

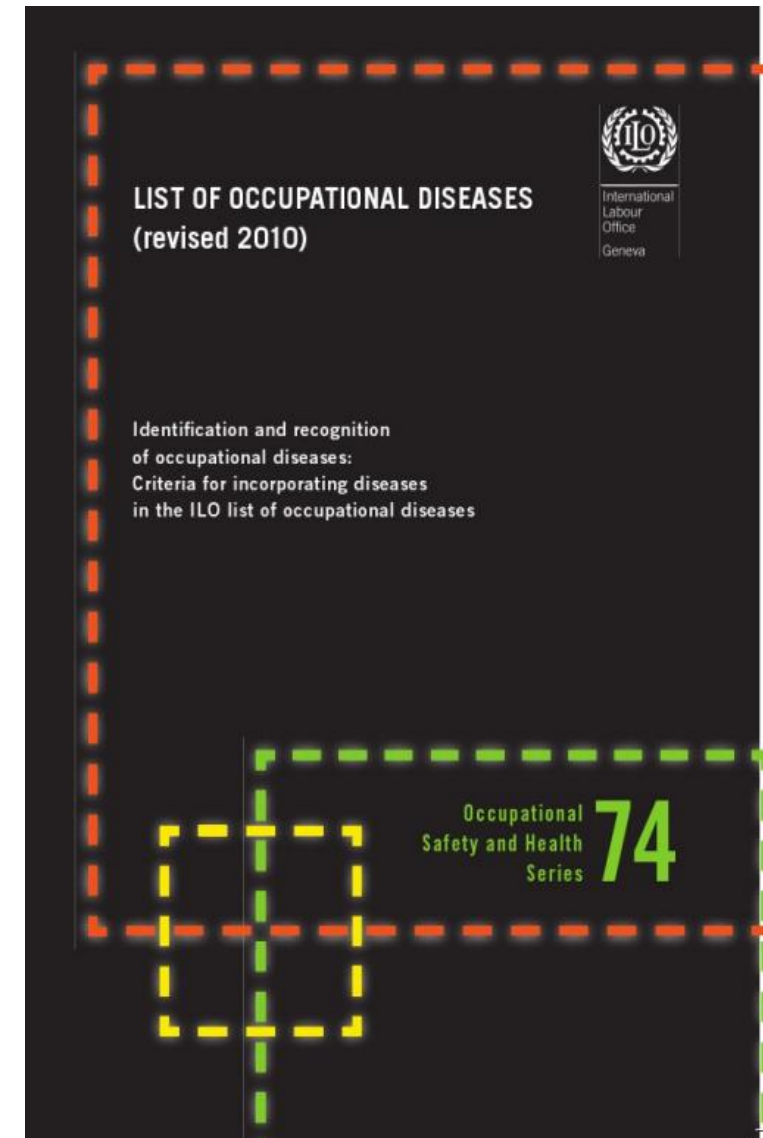
2.1.3. Pneumoconioses caused by non-fibrogenic mineral dust

2.1.4. Siderosis

2.1.5. Bronchopulmonary diseases caused by hard-metal dust

2.1.6. Bronchopulmonary diseases caused by dust of cotton  
(***Byssinosis***), flax, hemp, sisal or sugar cane-Bagassosis

2.1.7. **Asthma** caused by recognized sensitizing agents  
or irritants inherent to the work process



# Classification of Occupational diseases-2

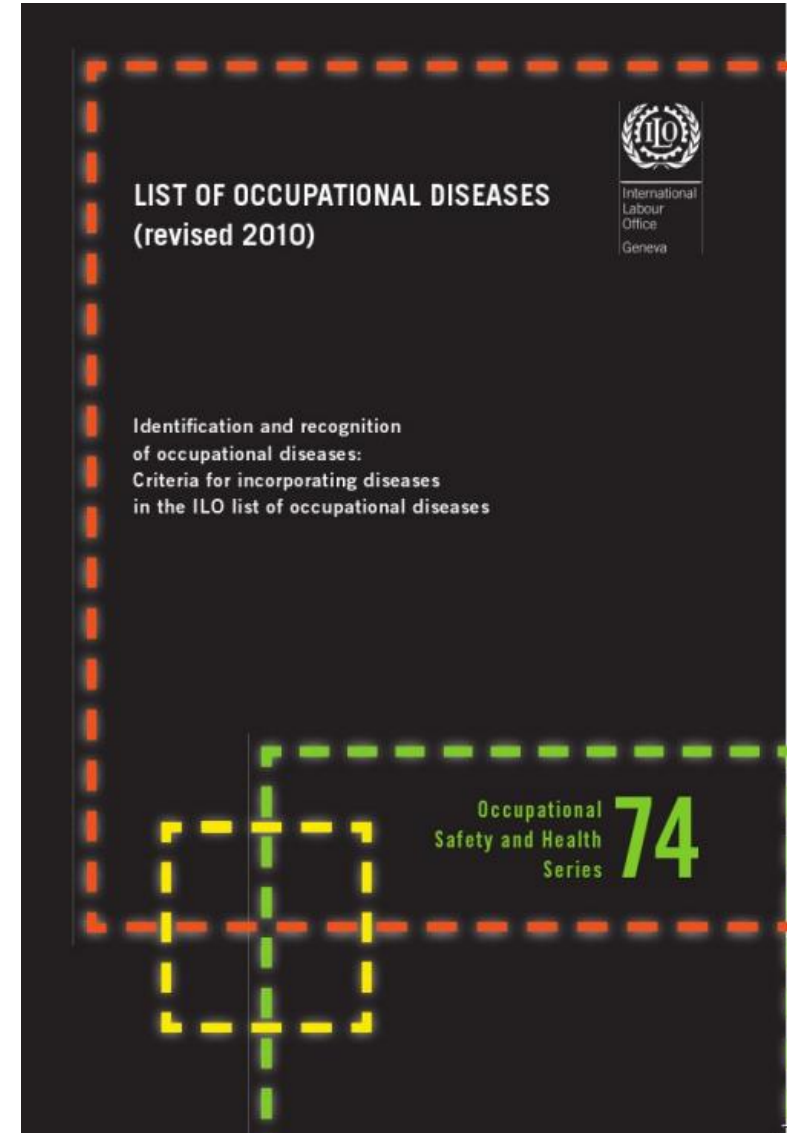
## Occupational diseases by target organ systems

### 2.1. Respiratory diseases

2.1.8. Extrinsic allergic alveolitis caused by the inhalation of organic dusts or microbially contaminated aerosols, arising from work activities

2.1.9. *Chronic obstructive pulmonary diseases (COPD)* caused by inhalation of coal dust, dust from stone quarries, wood dust, dust from cereals and agricultural work, dust in animal stables, dust from textiles, and paper dust, arising from work activities

2.1.10. Diseases of the lung caused by aluminum



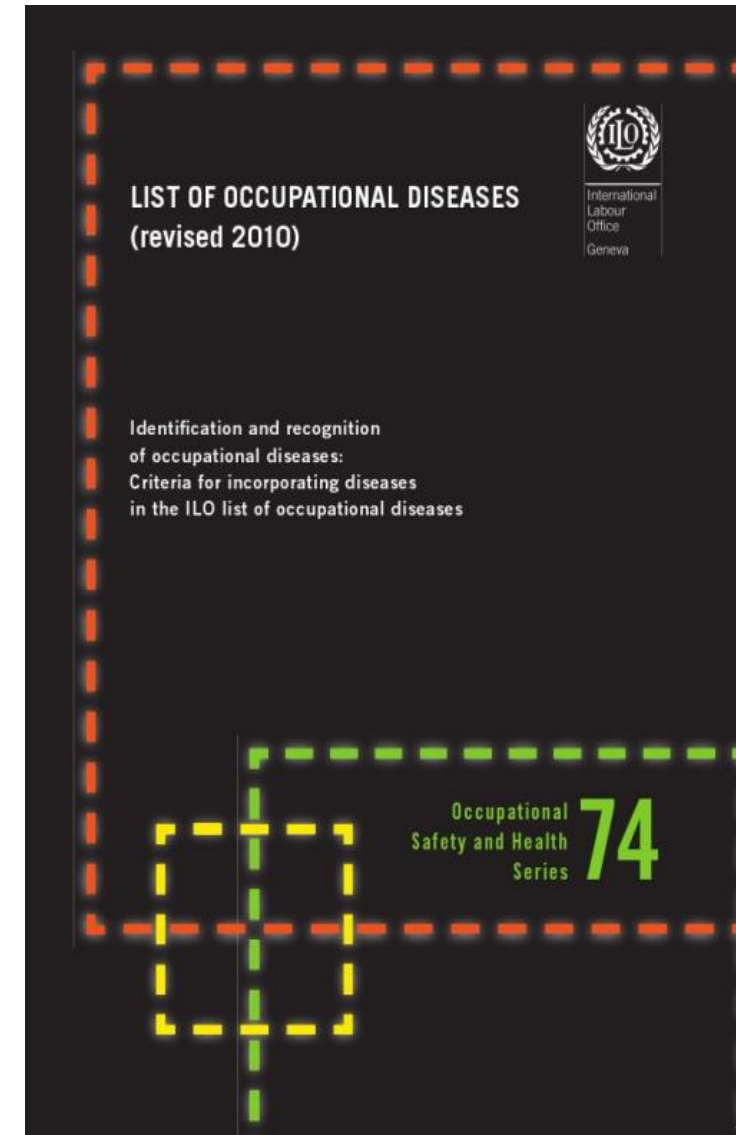
# Classification of Occupational diseases-3

**Occupational diseases** by target organ systems

## 2.1. Respiratory diseases

2.1.11. Upper airways disorders caused by recognized sensitizing agents or irritants inherent to the work process

2.1.12. Other respiratory diseases not mentioned in the preceding items where a direct link is established scientifically or determined by methods appropriate to national conditions and practice, between the **exposure to risk factors** arising from work activities and the disease(s) contracted by the worker.



# Air Pollution

## Medical Effects



**Pneumonitis**



**Heart Diseases**



**Asthma**



**Cancer**

credihealth





# ROLE OF INDOOR AIR QUALITY IN OCCUPATIONAL HEALTH AND SAFETY.

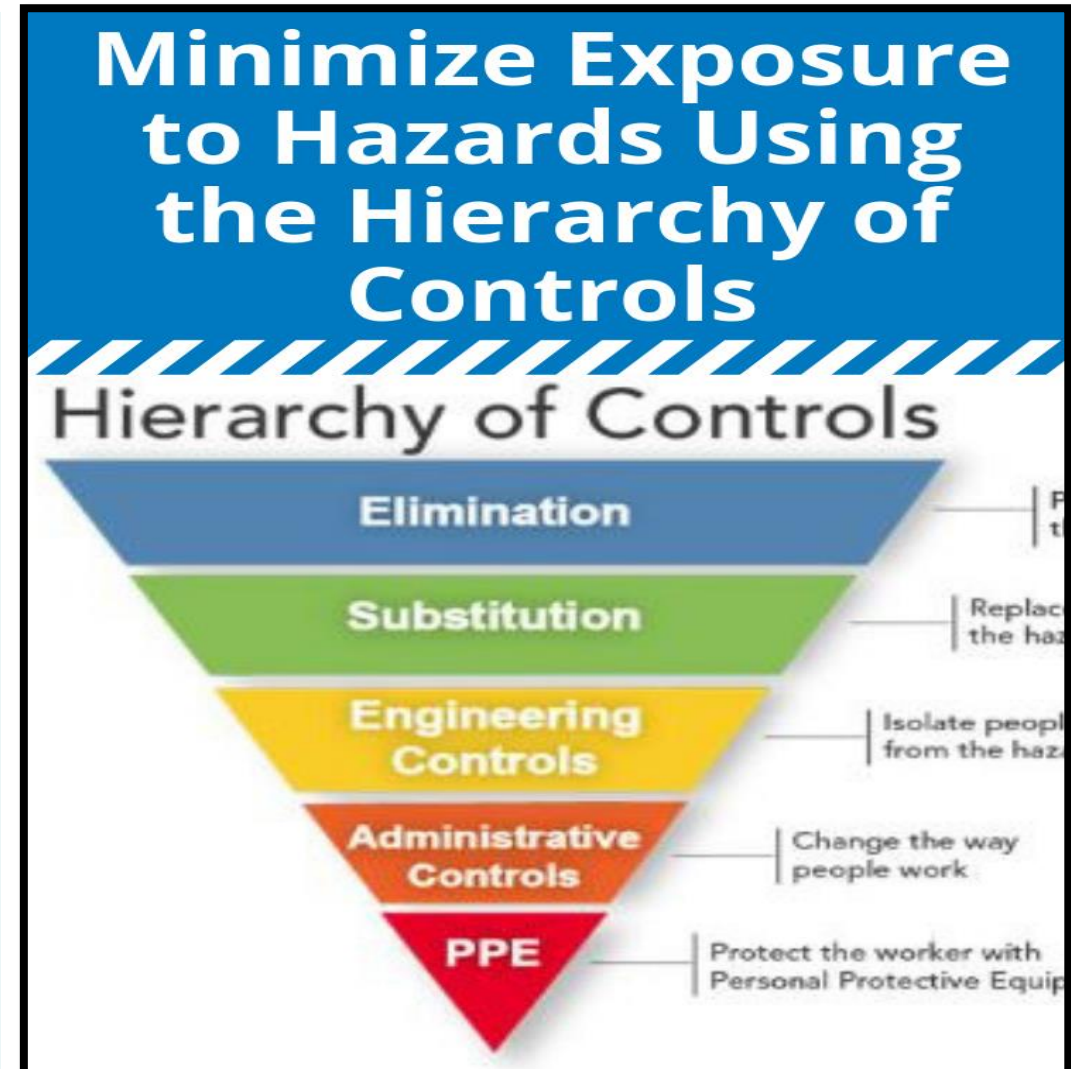
# The negative effects of poor indoor air quality

- ✓ The negative effects of poor indoor air quality have been widely documented. [The EPA](#) lists the following health effects that **poor indoor air quality** can have on humans:
  - *Irritation of the eyes, nose, and throat.*
  - Headaches, dizziness, and fatigue.
  - *Respiratory diseases, heart disease, and cancer.*
- The EPA** further notes that “episodes of Legionnaires’ disease, a form of pneumonia caused by exposure to the Legionella bacterium, have been associated with buildings with poorly maintained air conditioning or heating systems.”
- ✓ **Poor indoor air quality** can also trigger asthma attacks and lead to **sick building syndrome**.



# The prevention of occupational exposure..

- **The prevention of occupational exposure** to workplace air pollution follows a well-established hierarchy of interventions where priority is given to elimination or substitution of the occupational hazard, as the most effective intervention, followed by other engineering controls to reduce exposure, such as encapsulation, local and general ventilation and wet processes.



[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# *The prevention of occupational exposure..*

- **The prevention of occupational exposure** to workplace air pollution follows a well-established hierarchy of interventions where priority is given to elimination or substitution of the occupational hazard, as the most effective intervention, followed by other engineering controls to reduce exposure, such as encapsulation, local and general ventilation and wet processes.
- *The least effective measures for control of air pollution are administrative controls, such as organization of work and rotation of workers to reduce exposure duration, training of workers, as well as the use of **personal protective equipment (PPE)** for respiratory protection, as ultimate temporary measure.*

[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# *The prevention of occupational exposure..*

- WHO has estimated outdoor air pollution causes 4.2 million premature deaths worldwide every year among the general population, including **workers**.
- In 2016, 91% of the world population were living in places where the WHO standards for air quality were **not met**.
- The **main pollutants** of outdoor air include:
  - (1) particulate matter – fine particulate matter (PM<sub>2.5</sub>) and coarse particulate matter (PM<sub>10</sub>);*
  - 2) ozone (O<sub>3</sub>); nitrogen dioxide (NO<sub>2</sub>); and*
  - (3) sulfur dioxide (SO<sub>2</sub>).*



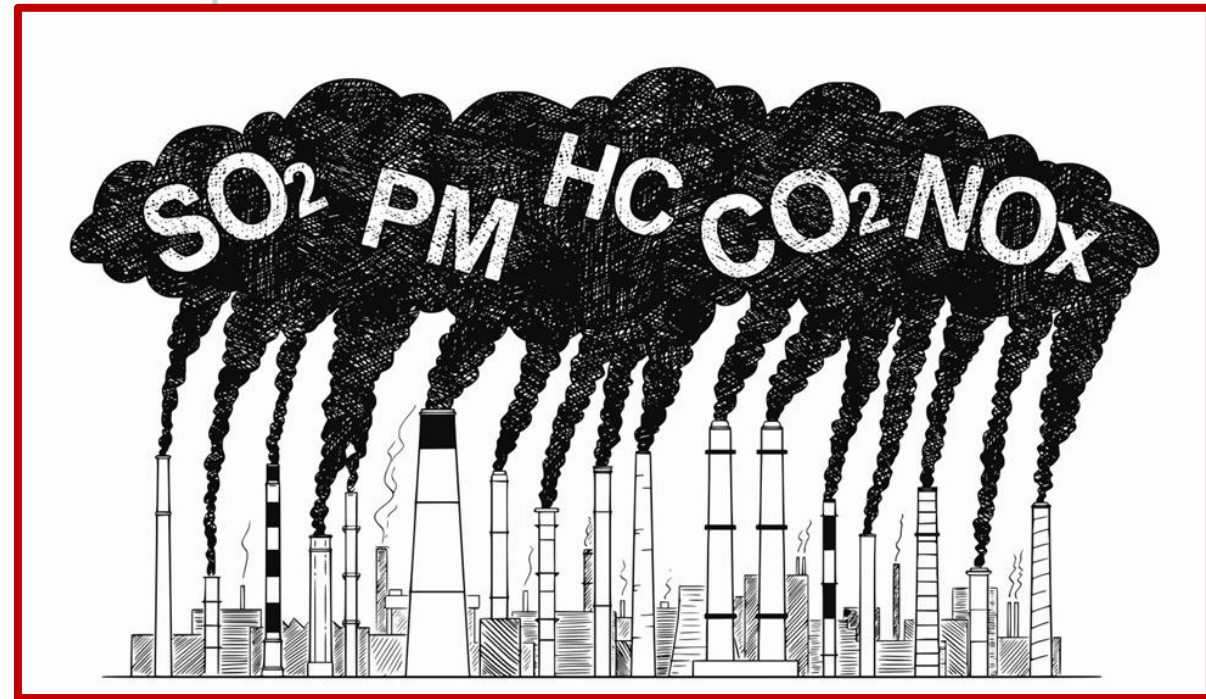
# *Pollution of air at the workplace-1*

- ***Pollution of air at the workplace***, being indoors in the work premises, or during work outdoors is harmful to health and can be prevented.
- For this reason the 13th WHO General Programme of Work (2019-2023) states that “with respect to air pollution (*i.e. outdoor, household and workplace air pollution*) and climate change/**DISASTER** mitigation,



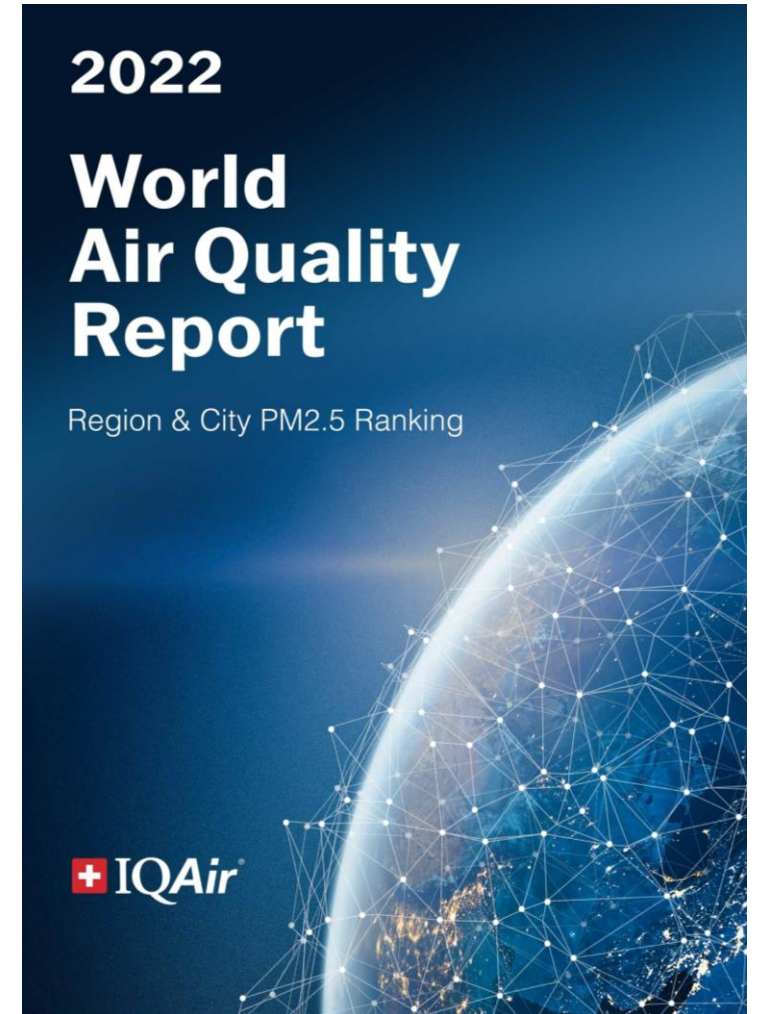
# Pollution of air at the workplace-2

- *WHO will scale up its work with different sectors -including transport, energy, housing, waste, labor and urban planning- at the national and local level to monitor **air quality**, develop strategies for transitioning to*
- Healthier technologies and fuels and for ensuring that all populations breathe air that meets the standards of **WHO's Air Quality Guidelines**,
- *And that scientific evidence will be translated into effective policies.*



# WHO's Air Quality Guideline

- ❑ By reducing air pollution levels, countries can reduce the *burden of disease* (**DALY, QUALY**) and long and short-term illnesses.
- ❑ The updated guidelines state that annual average concentrations of PM<sub>2.5</sub> should not exceed 5 µg/m<sup>3</sup>, while 24-hour average exposures should not exceed 15 µg/m<sup>3</sup> more than 3 - 4 days per year.





# WHO's Air Quality Guideline

## WHO AIR QUALITY GUIDELINES



**NO<sub>2</sub>**

2005: 40  $\mu\text{g}/\text{m}^3$ , annual

**2021: 10  $\mu\text{g}/\text{m}^3$ , annual**

**PM<sub>2.5</sub>**

2005: 10  $\mu\text{g}/\text{m}^3$ , annual

**2021: 5  $\mu\text{g}/\text{m}^3$ , annual**

**PM<sub>10</sub>**

2005: 25  $\mu\text{g}/\text{m}^3$ , annual

**2021: 15  $\mu\text{g}/\text{m}^3$ , annual**

**Ozone**

2005: 100  $\mu\text{g}/\text{m}^3$ , 8-hour max

**2021: 100  $\mu\text{g}/\text{m}^3$ , 8-hour max**



# Air pollution is a human carcinogen!

- Outdoor air pollution can cause asthma, chronic obstructive pulmonary diseases and impaired lung function, lung cancer, heart attacks and stroke.
- *Children and adults with pre-existing asthmatic and respiratory condition and those with high risk of cardio- and cerebrovascular diseases are particularly **at risk**.*
- **Air pollution is recognized as human carcinogen (group A)** by the International Agency for Research on Cancer (IARC).

# Air pollution is a human carcinogen!

- Addressing air pollution, which is the 2nd highest risk factor for noncommunicable diseases, is key to **protecting public health**. Most sources of outdoor.
- Air pollution is one of **the greatest environmental risk to health**.
- By reducing air pollution levels, countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including **asthma**.

*A Rough Guide to*  
**IARC CARCINOGEN CLASSIFICATIONS**

The International Agency for Research on Cancer (IARC) classifies substances to show whether they are suspected to cause cancer or not. It places substances into one of five categories depending on the strength of evidence for their carcinogenicity.

GROUP	WHAT DOES IT MEAN?	WHAT DOES IT INCLUDE?
<b>GROUP 1</b>	<b>CARCINOGENIC TO HUMANS</b> Sufficient evidence in humans. Causal relationship established.	 Smoking, exposure to solar radiation, alcoholic beverages and processed meats.
<b>GROUP 2A</b>	<b>PROBABLY CARCINOGENIC TO HUMANS</b> Limited evidence in humans. Sufficient evidence in animals.	 Emissions from high temp. frying, steroids, exposures working in hairdressing, red meat.
<b>GROUP 2B</b>	<b>POSSIBLY CARCINOGENIC TO HUMANS</b> Limited evidence in humans. Insufficient evidence in animals.	 Coffee, gasoline & gasoline engine exhaust, welding fumes, pickled vegetables.
<b>GROUP 3</b>	<b>CARCINOGENICITY NOT CLASSIFIABLE</b> Inadequate evidence in humans. Inadequate evidence in animals.	 Tea, static magnetic fields, fluorescent lighting, polyethene.
<b>GROUP 4</b>	<b>PROBABLY NOT CARCINOGENIC</b> Evidence suggests no carcinogenicity in humans/animals	<b>1</b> ONLY 1 CHEMICAL EVER PLACED IN THIS GROUP. OF ALL SUBSTANCES ASSESSED Caprolactam, which is used in the manufacture of synthetic fibres.

THE IARC'S INDEX ONLY TELLS US HOW STRONG THE EVIDENCE IS THAT SOMETHING CAUSES CANCER. SUBSTANCES IN THE SAME CATEGORY CAN DIFFER VASTLY IN HOW MUCH THEY INCREASE CANCER RISK.

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[https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health) 14.3.24

# Air pollution is a human carcinogen!

- The combined effects of ambient (out door) air pollution and household (in door) air pollution are associated with **6.7 million premature deaths annually**.
- *Ambient (outdoor) air pollution is estimated to have caused 4.2 million premature deaths worldwide in 2019.*



*New IARC headquarters, 4 February 2019, Vienna*

**IARC- International Agency for Research on Cancer / WHO**

[https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health) 14.3.24



# *Outdoor workers & ambient air pollution*

- Outdoor workers are particularly vulnerable to ***ambient air pollution***.
- *Worldwide at least 1.2 billion workers work outdoors most of their work time.*
- These include agricultural workers, street vendors and delivery workers, urban transport, traffic police, and road repair, construction, waste collection etc.
- *In addition to **breathing polluted air**, such **workers** are often exposed to other environmental risks, such as heat and cold, heavy rain, wind and other climatic conditions as well solar UV and allergenic pollens.*

# *Outdoor workers & ambient air pollution*

- ❑ In addition, outdoor workers are exposed to a range of ***occupational hazards*** arising from their specific work activities – fumes, particles and fibres, toxic chemicals, noise, vibrations, manual handling of loads, awkward work posture, psychological harassment (e.g. *mobbing*) and worksite accidents.
- ❑ *The evidence on the health impacts of **occupational exposure** to outdoor air pollution is scarce – few recent studies have found impairment in the lung function of exposed **workers**.*

# *Occupational exposure to outdoor air pollution*

- ❑ Occupational exposure to outdoor air pollution is a particular concern, because the exposed population is large and because the conventional measures for engineering controls of workplace hazards, such as hazard elimination, encapsulation and ventilation are not applicable to the outdoor environment.
  - ❑ *Also, employers and workers themselves may have little or no control over the sources of outdoor air pollution. However, all **workers**, including those working outdoors, should enjoy the right to favourable working conditions and to the highest attainable standard of physical and mental health.*
- Decent work** means also being able to breathe clean air at work.



# *Air pollution in indoor workplaces*

- ❖ Air pollution in indoor workplaces is also a major concern and has been traditionally addressed by **the occupational health and safety** regulations and programmes.
- ❖ *Sources of air pollution in indoor workplaces include technological processes, burning of materials and waste, cleaning, transport vehicles and engines with internal combustion, heating etc.*



[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# Air pollution in indoor workplaces

- ❖ **Air pollutants** at the workplace include a very wide range of chemical substances and preparations, gases, fumes and aerosols, particles, fibres etc.
- ❖ *The levels of exposure to air pollutants at the workplace can be much higher than outdoors.*
- ❖ **The health effects** can be systemic toxic effects and acute poisonings, allergies, such as asthma, chronic respiratory diseases, and **cancer**.



# *Air pollution in indoor workplaces*

- ❖ WHO estimates that health effects of **occupational exposure** to selected air pollutants at the workplace can cause more than 860 000 deaths a year.
- ❖ The real magnitude of the **health impacts** on **workplace air pollution** is likely to be much higher, but it is difficult to quantify the **global burden of disease** (QUALY & DALY) given the wide diversity of air pollutants and **occupational exposures** in the different workplaces, sectors and activities.

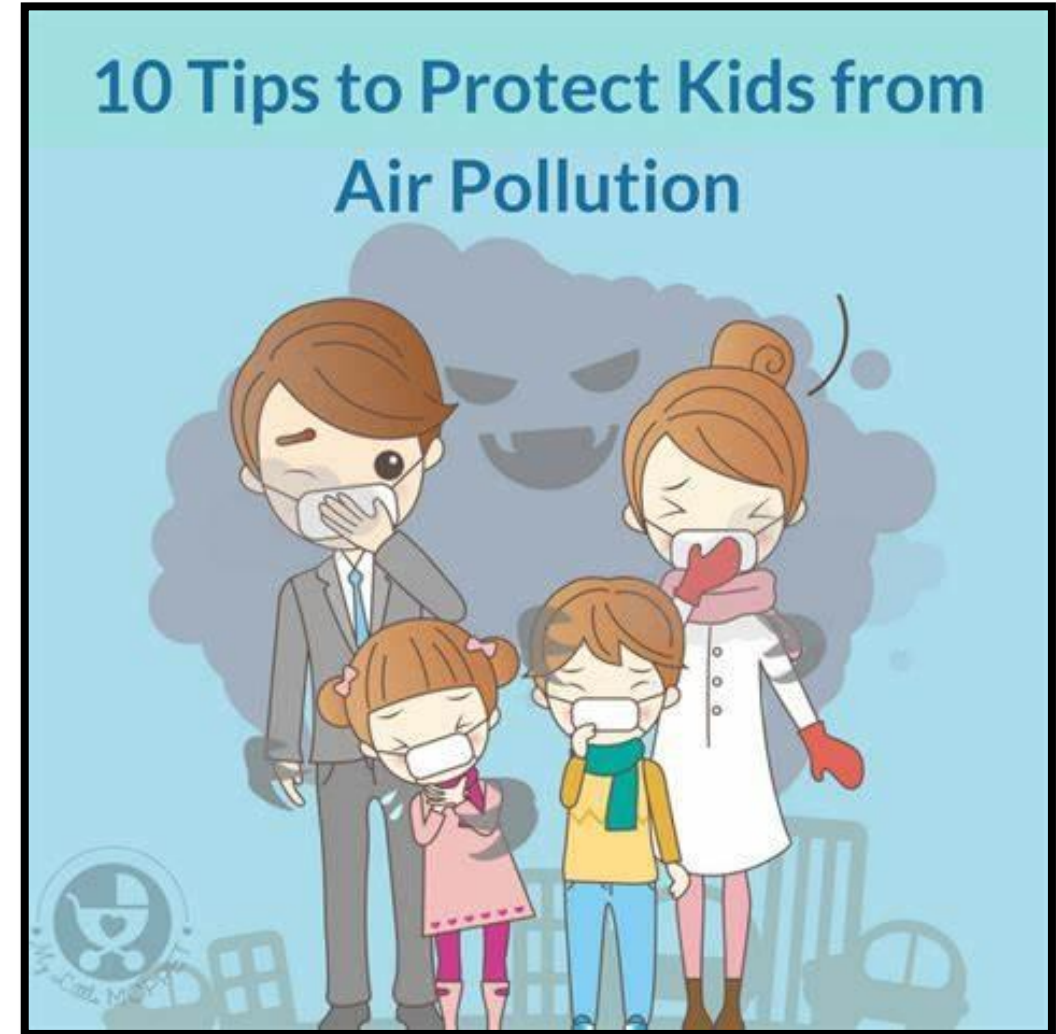
**Clean Air Promotes**



**Worker Safety**

# Protection of workers' health from air pollution

- ✓ **The WHO Air Quality Guidelines** provide thresholds for health-harmful levels of **air pollution** for the general population.
- ✓ *The international labour conventions on occupational safety and health by ILO apply to **all workers and in all workplaces**, including outdoor workplaces.*
- ✓ Under the Occupational Safety and Health Convention, 1981 (No. C-155) employers shall be required to:



[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# Protection of workers' health from air pollution

- ✓ (1) ensure that, so far as is reasonably practicable, the workplaces, machinery, equipment and processes under their control are safe and without risk to health;
- ✓ (2) ensure that, so far as is reasonably practicable, the chemical, physical and biological substances and agents under their control are without **risk to health** when the appropriate measures of protection are taken;



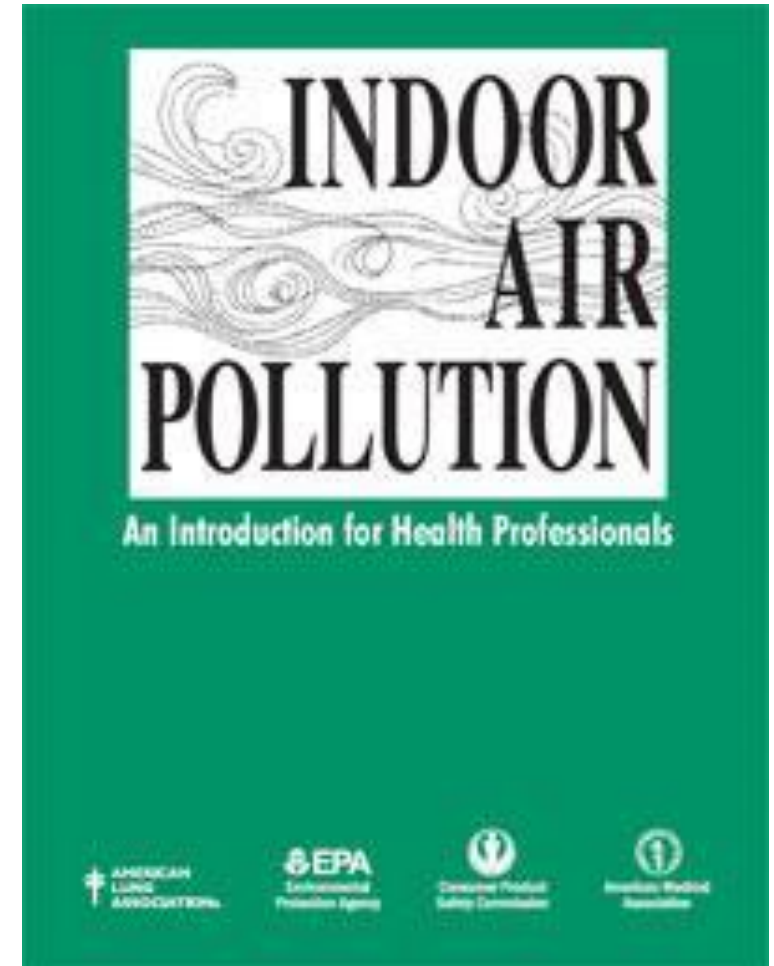
# Protection of workers' health from air pollution

- (3) provide, where necessary, **adequate protective clothing** and protective equipment (PPE) to prevent, so far as is reasonably practicable, risk of accidents or of **adverse effects on health**.
- Other international labour standards relevant to ambient air pollution and its health effects are the Convention concerning the Protection of Workers against Occupational **Hazards in the Working Environment Due to Air Pollution**, Noise and Vibration (ILO C-148 from 1977) and the Convention concerning Prevention and Control of **Occupational Hazards caused by Carcinogenic Substances** and Agents (ILO C-139 from 1976).



# *Examples of workplace measures to protect workers from ambient air pollution*

- ❑ Though, employers may have less influence on the quality of the outdoor environment than on the indoor environment,
- ❑ It is important to recognize that exposure to air pollution when working outdoors is also an ***occupational hazard for workers*** and it is necessary to apply **protective measures** “as far as reasonable practical”.
- ❑ Examples of workplace measures to ***protect workers*** from ambient air pollution include:



[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# *Examples of workplace measures to protect workers from ambient air pollution*

- ❑ Reduction of exposure – reducing the working time outdoors, rotation of workers, restricting work during episodes of **severe air pollution**, including dust storms.
- ❑ *Providing respiratory protection programmes*  
– *appropriate respirators, fit testing, training of workers.*
- ❑ Medical surveillance of workers - medical check-ups for underlying health conditions that can worsen with exposure to air pollution – for example **asthma, COPD**, cardiovascular diseases (*risk of heart attack and stroke*).



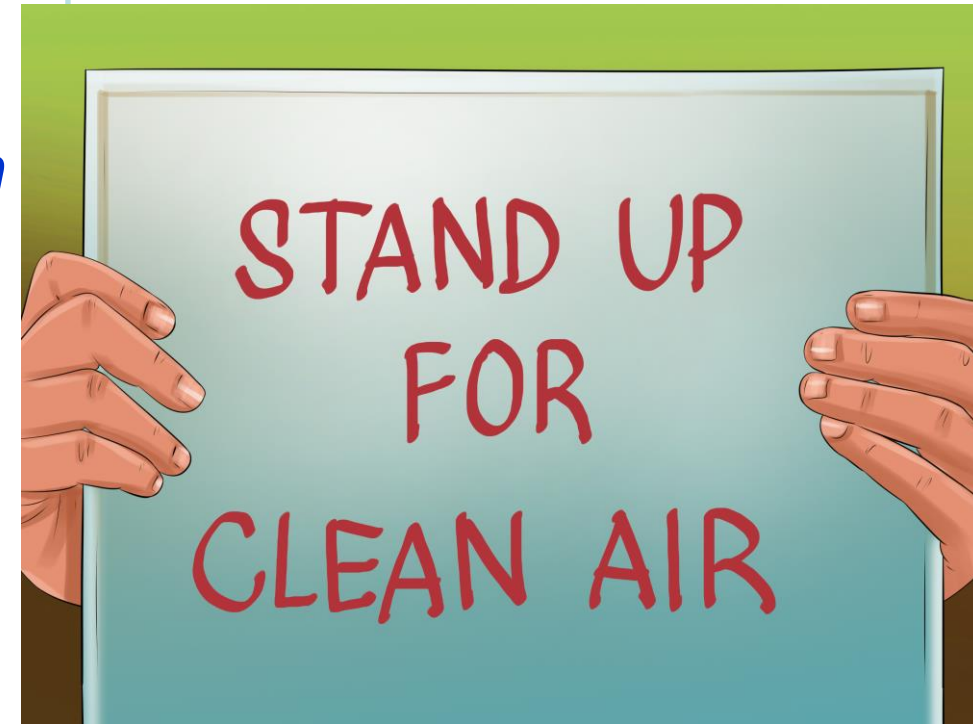
# *Examples of workplace measures to protect workers from ambient air pollution*

- ❑ **Health surveillance** of working environment  
– recording levels of air pollution from the municipal sources.
- ❑ *Reporting of cases of **occupational diseases** that can be caused by ambient air pollution among exposed workers (asthma, chronic obstructive pulmonary disease-COPD, lung cancer) & follow up with the employment injury scheme.*



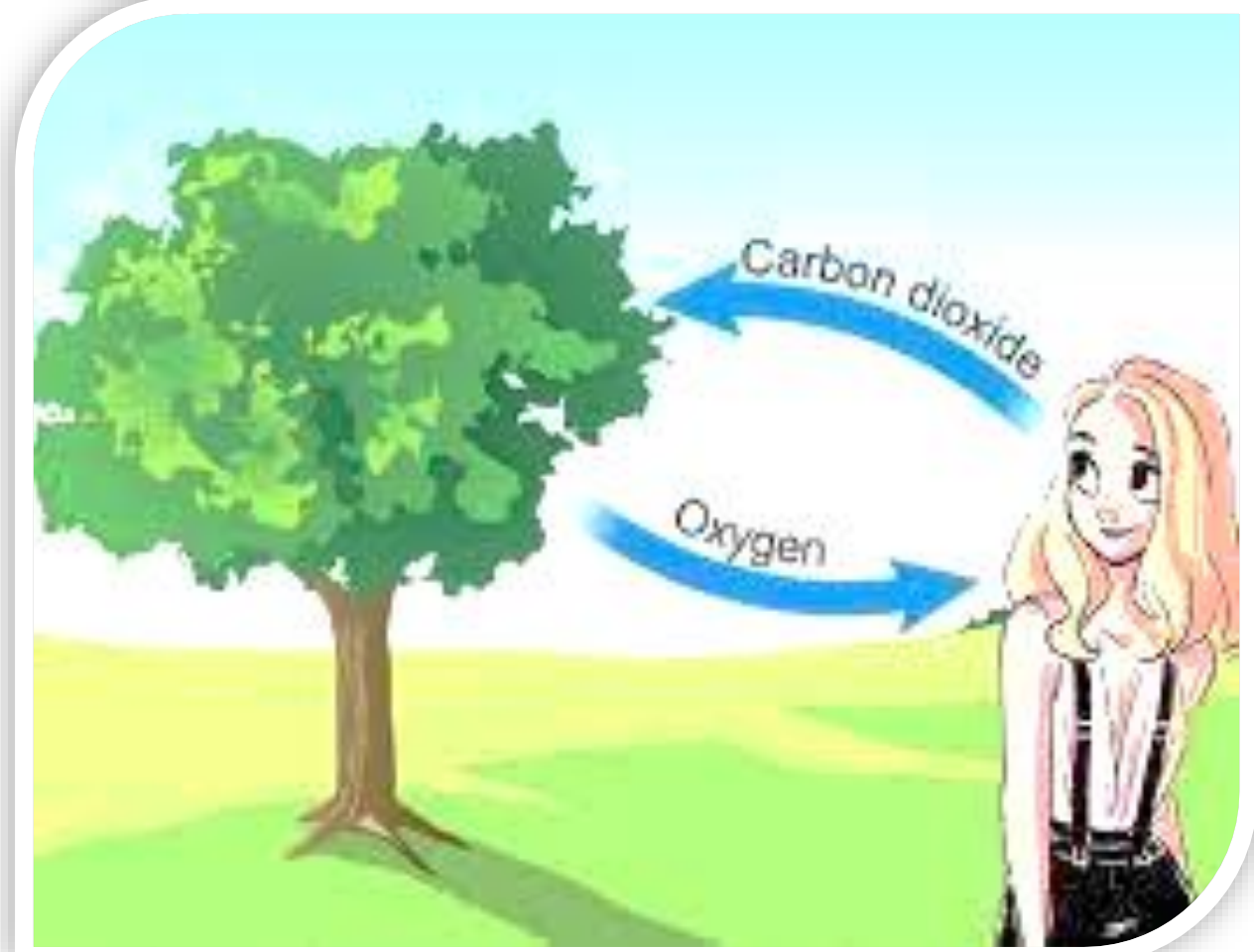
# Reducing air pollution

- In addition, undertakings could contribute to by:
- **Reducing use of solid fuels** in work processes and moving to cleaner energy sources.
- *Applying technologies reducing black carbon emissions (e.g. from traditional brick kilns and coke ovens).*
- **Waste reduction**, separation, processing, management and recycling and reuse instead of open **incineration** of solid waste.



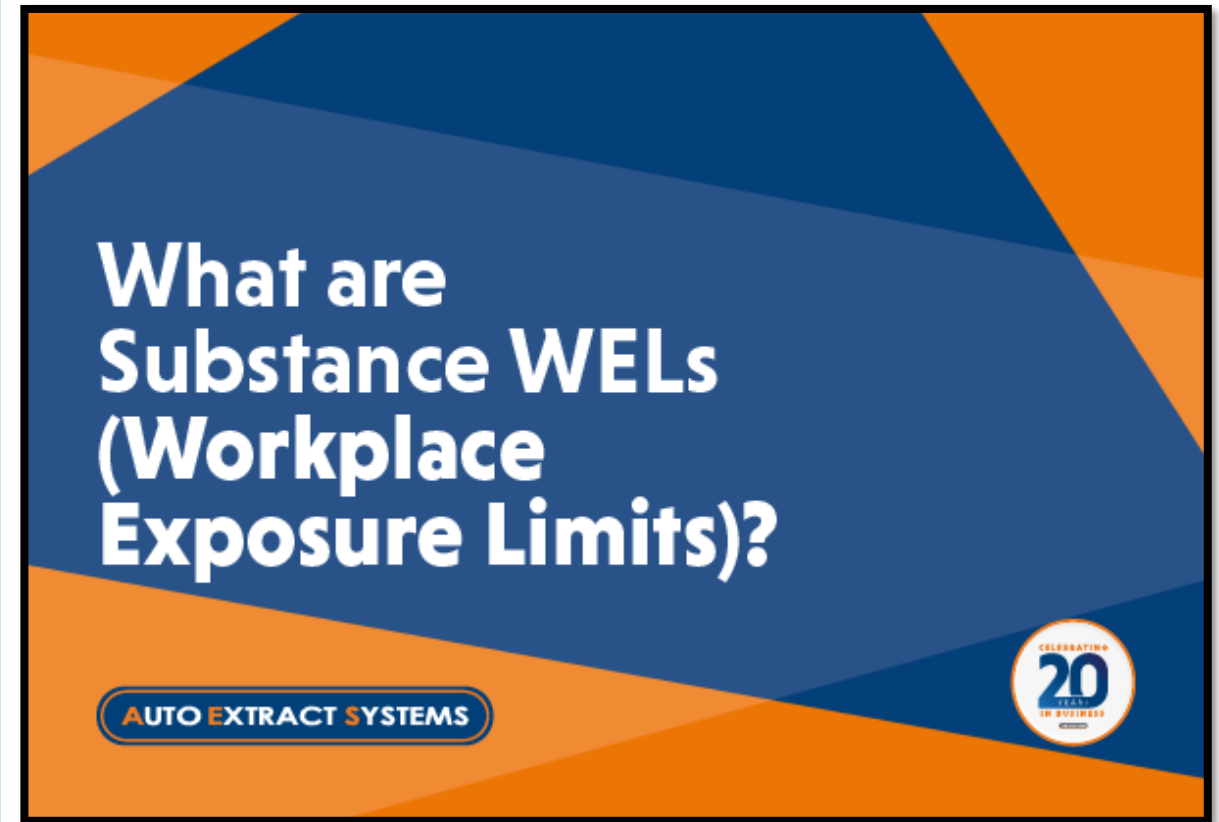
# Reducing air pollution

- Reduced open burning of agricultural residues and applying alternative techniques for crop management.
- *Replacing or supplementing diesel generators with devices using renewable energy.*
- Promoting walking and cycling for commuting of **workers to the workplace.**



# *Measures at the national level to address occupational exposure*

- Measures at the national level to address **occupational exposure** to air pollution could be:
  - Warnings for reducing or **stopping work** outdoors in periods of severe air pollution.*
  - Raising awareness of employers and workers about ambient air pollution and their responsibility for **occupational health and safety (OSH).**



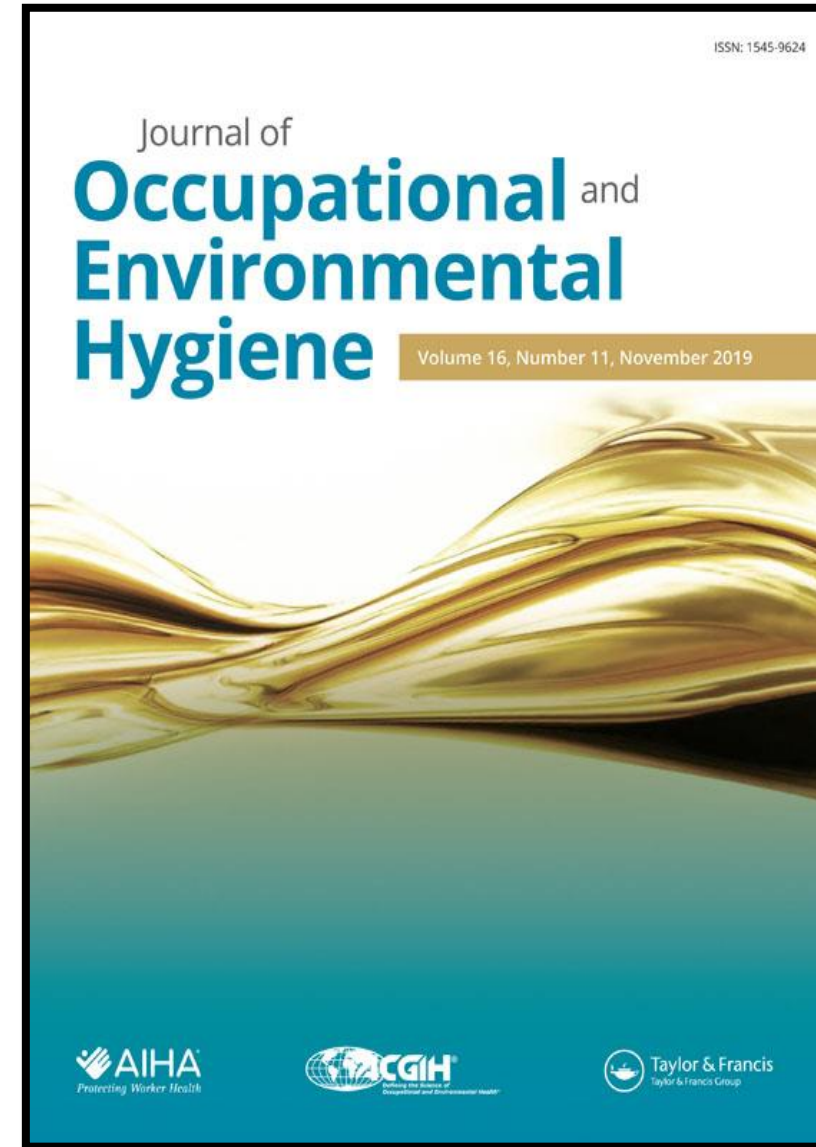
# Measures at the national level to address occupational exposure

- Recognition of exposure to ambient air pollution while working outdoors as an **occupational safety and health issue (OSH)** and using the existing OSH (*Occupational Safety and Health*) regulations and standards to provide **protection of workers.**



# *Measures at the national level to address occupational exposure*

- ❑ Providing toolkits and programmes for engaging businesses and workplaces in prevention and control of air pollution, for example by avoiding open air **incineration** and controlling other sources of air pollution at the workplace.
- ❑ *Engaging with private sector, businesses and workplace undertakings for preventing **emissions** of air pollution and improving their overall environmental performance.*



# Measures at the national level to address occupational exposure

- ❑ Stimulating initiatives combining OSH-**Occupational Safety & Health**, environmental protection and **green workplaces** and technological transfer and innovations to prevent **ambient and workplace air pollution.**

## Limits on Occupational Doses (ICRP)

- Effective dose of 20 mSv per year— averaged over a period of 5 years
- Should not exceed 50 mSv in any one year
- Equivalent skin dose of 500 mSv per year— Limit is set on basis of avoiding deterministic effects
- Dose limits do not apply to radiation dose employee receives as part of personal healthcare

# Indoor Air Radon Concentration in Premises of Public Companies and Workplaces in Latvia

- ❑ The current study evaluated indoor air radon concentration of public buildings and workplaces at the national level according to Directive 2013/59/Euratom in light of the recommendations of world organisations to assess whether planning additional protective measures against radon is necessary for Latvia.
- ❑ The ***indoor air radon gas concentration*** in most Latvian companies and public buildings is low and does not exceed the national permissible limit values.

*Int. J. Environ. Res. Public Health* **2022**, *19*(4), 1993; <https://doi.org/10.3390/ijerph19041993> 17.3.23

[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)



# Indoor Air Radon Concentration in Premises of Public Companies and Workplaces in Latvia

- ❑ The data in our study indicate that ***higher levels of radon gas concentration*** were mainly attributable to insufficient ventilation (*especially after the renovation of a building with insulation without improving the ventilation system*).
- ❑ *In order to reduce the concentration of radon gas in indoor air in Latvia, it is recommended to improve the quality of **air exchange and ventilation**, paying special attention to schools and pre-school educational institutions.*

*Int. J. Environ. Res. Public Health* **2022**, *19*(4), 1993; <https://doi.org/10.3390/ijerph19041993> 17.3.23

[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

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# *The prevention of occupational exposure to workplace air pollution*

- ❑ The prevention of **occupational exposure** to workplace air pollution follows a well-established hierarchy of interventions where priority is given to elimination or substitution of the occupational hazard, as the most effective intervention, followed by other engineering controls to reduce exposure, such as encapsulation (*isolation*), local and general ventilation and wet processes.
- ❑ *The least effective measures for **control of air pollution** are administrative controls, such as organization of work and rotation of workers to reduce exposure duration, training of workers, as well as the use of personal protective equipment (PPE) such as suitable masks for respiratory protection, as ultimate temporary measure.*

# *The prevention of occupational exposure to workplace air pollution*

- ❑ Air quality standards have been established for a big number of **workplace air** pollutants by several organizations, such as the **Threshold Limit Values** (TLV) of the *American Conference of Governmental Industrial Hygienists'* (ACGIH) and Indicative Occupational Exposure Limits of the European Commission.
- ❑ *The international **chemical safety data cards** (MSDS) developed by WHO and ILO contain references to the available standards for occupational exposure to more than 1700 substances.*
- ❑ However, at the workplace the **principle is to avoid exposure**, if not possible to keep exposure levels as low as possible.



**Top 9 (Easy) Ways**

# To Improve Workplace Air Quality

[Top 9 \(Easy\) Ways To Improve Workplace Indoor Air Quality - Allwork.Space](#) 17.3.23

# 9 Easy Ways to Improve Air Quality in the Workplace-1

## 1. Keep the workplace clean

A clean indoor environment reduces dust and mold levels. You should vacuum carpets, rugs, and upholstery with a HEPA filter; you also need to clean curtains, windows, drapes, and clear any desk clutter (like stacks of paper, stacks of books, cables, etc.).

## 2. Change and give maintenance to your air filters

*HVAC air filters need to be taken care of properly.*

*This requires regular maintenance to keep filters clean and changing them every six to twelve months.*

*Clogged and dusty filters reduce airflow and increase the amount of pollutants and allergens in a closed environment.*

# 9 Easy Ways to Improve Air Quality in the Workplace-2

## 3. Keep air vents unblocked

*If furniture, boxes, storage units, chairs, or anything else is blocking the path of air vents, then the air won't circulate properly.*

*This can lead to workplaces that feel stuffy, which can result in a myriad of health problems.*

## 4. Open your windows

Use as much fresh air as possible.

If your workplace has windows, make sure you crack them open *(weather permitting)* to make it easier for air to circulate around your workplace.

Open windows also help flush out stale air.

# 9 Easy Ways to Improve Air Quality in the Workplace-3

## 5. Clean up immediately after spills

*Did someone drop a glass of water or a cup of coffee or tea?*

*Make sure it's cleaned up.*

*The same goes for leaks, as damp areas and excess moisture support the growth of mold and mildew, which significantly affect air quality.*

## 6. Dispose of garbage promptly and store food properly

Food attracts pests and they can also generate unpleasant odors.

Make sure you're disposing of kitchen garbage regularly and promptly and that all workspace users are storing their food properly. This also requires that you do regular refrigerator and kitchen cleanups (*throwing away food that's gone bad, disinfecting dining areas, etc.*).



# 9 Easy Ways to Improve Air Quality in the Workplace-4

## 7. Embrace plants (but take proper care of them)

*Plants in the workplace offer various health benefits. They also make a workplace more beautiful and they can even help reduce noise levels. However, if you're going to have plants in the office, you need to take proper care of them (watering them and cleaning the dust from their leaves).*

## 8. Invest in the right products

According to the **EPA**, “Many common products used in offices, like solvents, adhesives, cleaners, and pesticides can give off pollutants and odors, as can office equipment such as copiers, printers, and fax machines.”

*These types of products should be placed separately and provided with separate ventilation systems. It's also important that you carefully select cleaning products and paint; you'll want to pick products that don't have any harsh smells and that are environmentally friendly.*

# 9 Easy Ways to Improve Air Quality in the Workplace-5

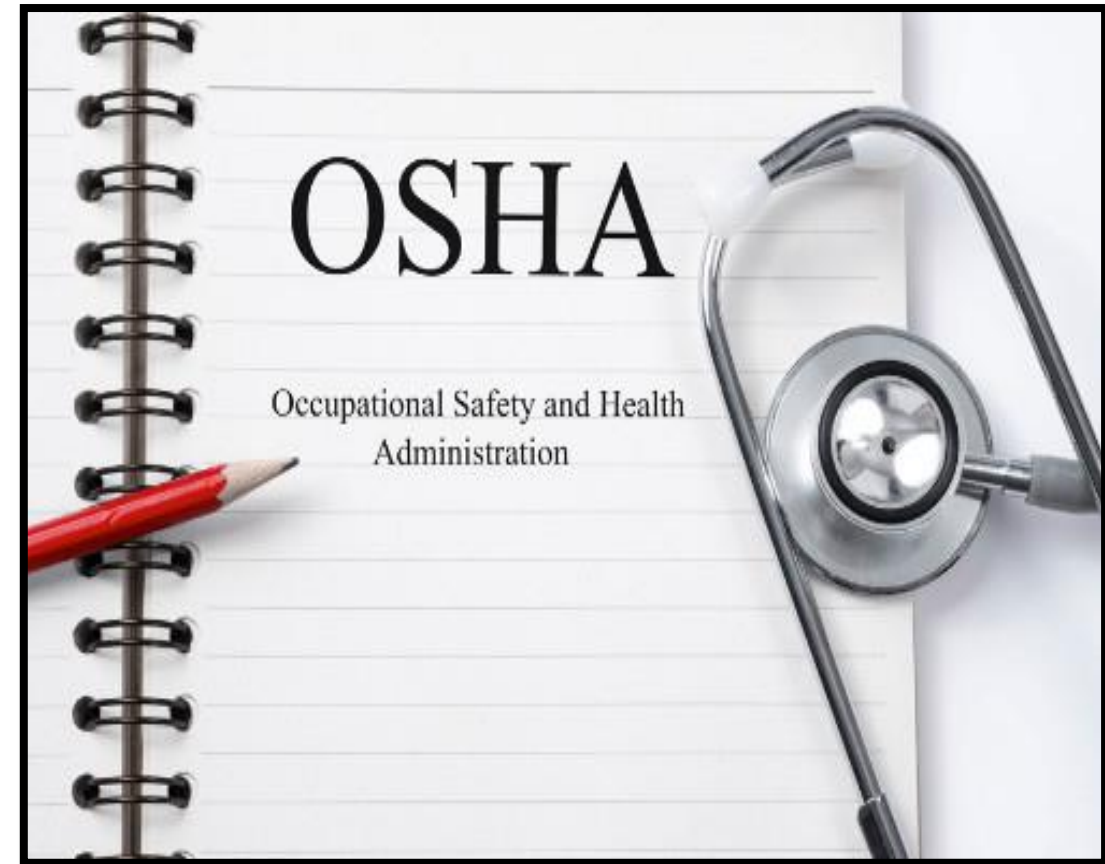
## 9. Conduct regular air quality tests

- Testing your workplace's air quality will provide you with the right information and insights to make sure your efforts are well-directed and efficient.
- These tests measure *air flow, humidity levels, odors, ventilation, leaks, water damage, mold growth....*
- If you notice more people are suffering from **allergies** or getting sick than usual, you might want to schedule a test.



# *Workplace should have medical surveillance*

- ❑ Workers, exposed to air pollution at their workplace should have *medical surveillance*, including pre-placements, periodic and final medical examinations and tests to identify
- ❑ *any pre-existing health conditions that can worsen as a result of exposure to air pollution,*
- ❑ as well as to determine as early as possible any health effects of the ***occupational exposure*** and to take measures for prevention of diseases and disability. **(DALY & QUALY!)**



# *Occupational Hazards in the Working Environment*

- ❑ The International Labour Convention concerning the **Protection of Workers** against ***Occupational Hazards in the Working Environment Due to Air Pollution***, Noise and Vibration (**ILO** C-148 from 1977) requires parties (*46 countries have ratified*) to develop national laws or regulations and technical standards for the prevention and control of, and protection against, **occupational hazards** in the working environment due ***to air pollution***, noise and vibration.
- ❑ *There are also specific international **ILO labor conventions** on prevention and control of occupational hazards caused by **carcinogenic** substances and agents (**ILO** C-139 from 1976) and on the use of **asbestos**.*

[https://www.who.int/airpollution/events/conference/05\\_Protecting\\_workers\\_from\\_air\\_pollution\\_outdoors\\_and\\_indoors.pdf](https://www.who.int/airpollution/events/conference/05_Protecting_workers_from_air_pollution_outdoors_and_indoors.pdf)

# NIOSH : *Occupational respiratory disease surveillance*

- *Occupational respiratory disease surveillance*

is the ongoing, systematic collection, analysis, and dissemination of health and hazard data to monitor the extent and severity of occupationally-related lung disease and related workplace exposures for use in *public health education and in disease prevention*.



<https://www.cdc.gov/niosh/topics/surveillance/ORDS/> 8.6.21

# NIOSH : *Occupational respiratory disease surveillance*

- This **NIOSH** Topic page also includes information about *occupational respiratory disease medical screening and monitoring* – the systematic evaluation of exposed workers to detect potential **health problems** at an **early stage** and to facilitate action to **prevent the development or progression of occupationally-related respiratory disease.**

<https://www.cdc.gov/niosh/topics/surveillance/ORDS/> 8.6.21



# NIOSH : Occupational respiratory disease surveillance

- ❑ USA **NIOSH** conducts investigations of possible **health hazards in the workplace**.
- ❑ These investigations, called Health Hazard Evaluations (HHEs) are conducted under the authority of the **Occupational Safety and Health** Act of 1970 and the authority of the Mine Safety and Health Act of 1977, which authorize the Secretary of **Health and Human Services**, following a written request from employees, authorized representative of employees, or employers, to determine whether any substance normally found in the place of employment has potentially **toxic effects** in such concentrations as used or found.

<https://www.cdc.gov/niosh/topics/surveillance/ORDS/> 8.6.21

## What is NIOSH?

National Institute for Occupational Safety and Health

Mission is to prevent workplace illness, injury, and death



# *Please keep in mind!*

- **Occupational diseases-OD** are specific to occupation.
- **Occupational diseases-OD** are *almost preventable 100% so should be prevented.*
- **Occupational diseases-OD** are diagnosed in the presence of suspicion and investigation and regular conscious and **mandatory periodical examinations** by law and **ILO** Conventions.
- *If an **occupational diseases** is suspected, detailed occupational history should be taken*
- Blood, urine, and workplace measurements are performed for diagnosis of **OD**.
- *Technical, operational, and medical measures should be applied to prevent **OD**.*

**Work Related Disases-WRD** can also be occured among people other than labor with a decreased frequency and vice versa.



# *The Estimated Number of Occupational Diseases and Work-Related Diseases in Turkiye*

- Based on the data of **National Burden of Disease Studies in Turkiye**;
- 321,868 musculoskeletal disorders, 79,232 - 95,845 circulatory system diseases, 38,994 - 56,992 chronic obstructive pulmonary diseases (**COPD**), 14,563 - 19,858 **asthma** cases, 29,550 **hearing losses**, and 4,902 to 16,341 **cancer** cases are estimated to be **work-related**.
- According to the TSI (*Turkish Statistical Institute*) data, the number of **deaths** due to **occupational causes** was estimated to be 8,143 in circulatory system diseases; 1,913 in malignant tumors and 2,130 in **respiratory system diseases**.
- However, the lowest and the highest number of **occupational diseases** announced by the Social Security Institution (SGK) between 2007&2016 is 371 and 1,208, respectively.

<https://actamedica.org/index.php/actamedica/article/view/358> 18.5.22, <https://doi.org/10.32552/2019.ActaMedica.358>

More than **3.2 million deaths** occur every year due to work-related accidents and diseases. Moreover, **160 million new cases of occupational diseases** and **300 million non-fatal occupational accidents** are reported annually. Occupational safety and health (OSH or OHS) is a global concern.



There are up to 20 articles in the **Turkish Constitution** regulating various areas of working life i.e., the right and responsibility to work, organizing trade unions, right to social security, etc. The Articles related to working life play a central role in **protecting the labour force**, ensuring proper placement of the workers and providing a **safe working environment**.

More than **3.2 million deaths** occur every year due to work-related accidents and diseases. Moreover, **160 million new cases of occupational diseases** and **300 million non-fatal occupational accidents** are reported annually.

**Occupational safety and health (OSH or OHS) is a global concern.**



Two of the Constitutional articles directly concern **occupational safety and health.**

*“No one can be employed at the workplaces not suitable for their age, gender and capacity.*

*Children, women and the disabled are protected by Law” (art. 50).*

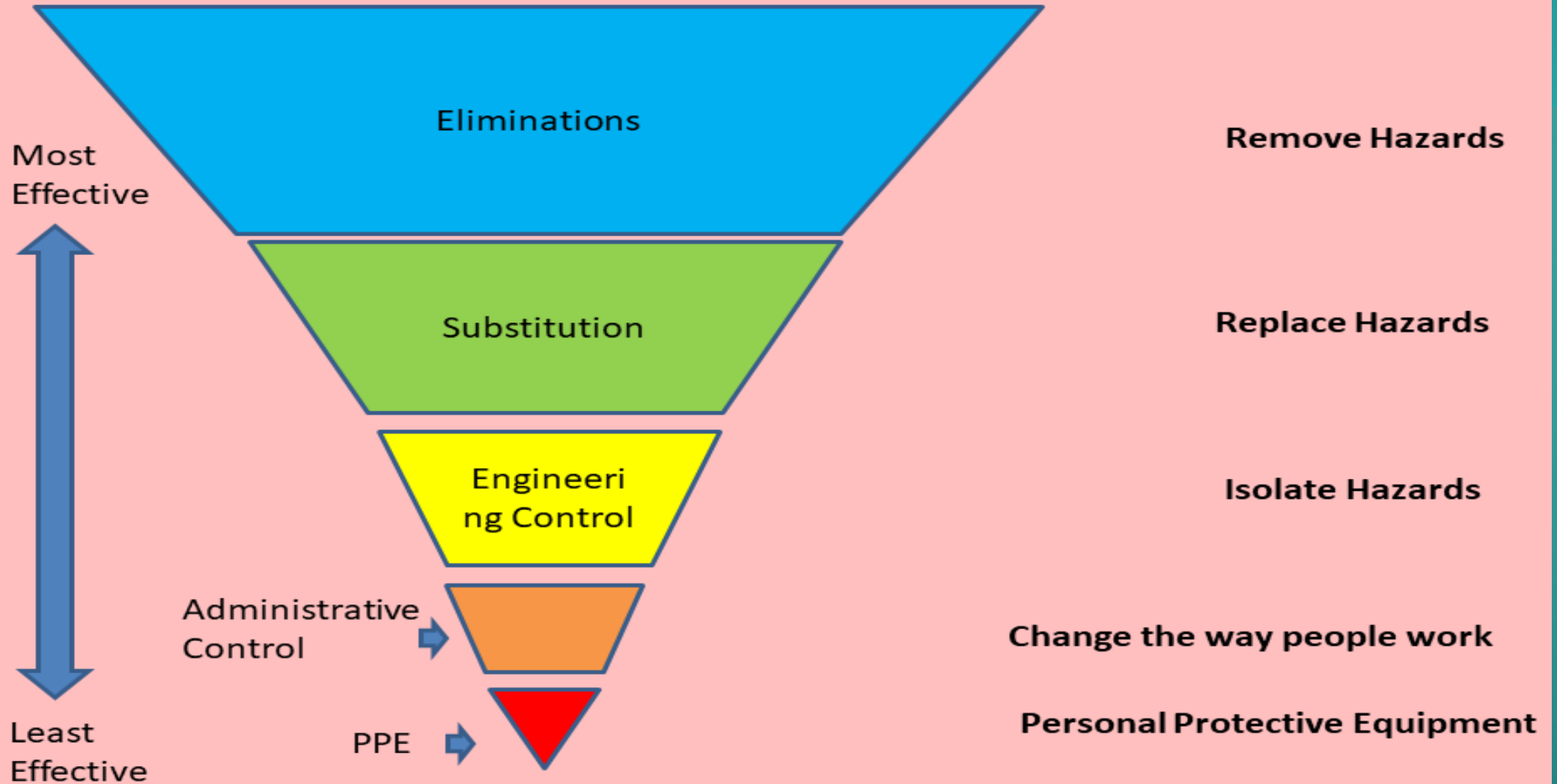
And **“Everyone has the right to live in a**

**healthy and balanced environment”** (art. 56).

**The Turkish Constitution** refers to the environment in general, nevertheless based on this article,

***the working environment should be “safe and healthy”.***

# Hierarchy of Hazards Controls



# IN CONCLUSION

In the context of managing work-related and occupational diseases caused by ambient air, here are **five important issues** that should be emphasized during the lecture:

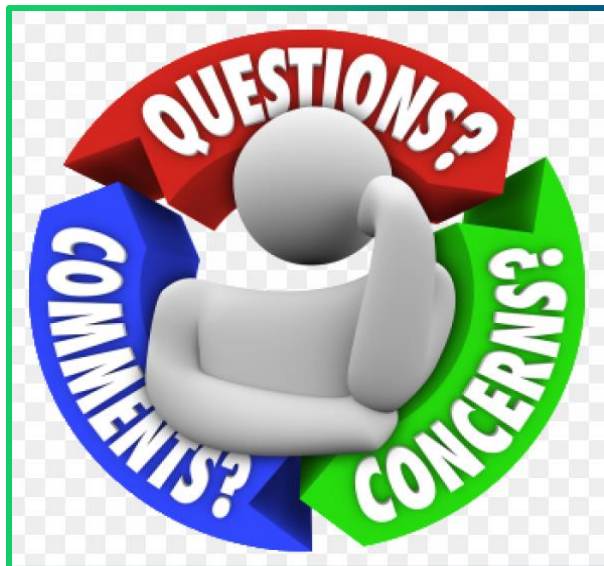
1. **Respiratory Diseases:** *Understanding and addressing respiratory conditions caused by workplace air pollution is essential.*
2. These include pneumoconioses (such as silicosis and asbestosis), bronchopulmonary diseases related to specific dust exposures (e.g., cotton dust, hard-metal dust), and asthma triggered by work-related sensitizing agents or irritants.
3. **Extrinsic Allergic Alveolitis:** *This condition results from inhaling organic dusts or microbially contaminated aerosols at work. Recognizing and preventing it are critical.*
4. **Chronic Obstructive Pulmonary Diseases (COPD):** COPD can arise from various occupational exposures, including coal dust, wood dust, and dust from agricultural work. Implementing preventive measures is crucial to safeguard workers' lung health.
5. **Upper Airways Disorders:** *These disorders, caused by sensitizing agents or irritants inherent to work processes, impact the upper respiratory tract. Identifying risk factors and minimizing exposure are vital.*
6. **Scientifically Established Links:** It's essential to establish direct links between exposure to workplace risk factors and specific diseases. By doing so, we can take targeted preventive actions to protect workers' health.
  - **Remember that** *pollution of air at the workplace, whether indoors or outdoors, can harm health and should be prevented. The World Health Organization emphasizes the need to monitor air quality, transition to healthier technologies, and ensure compliance with air quality guidelines*

**Occupational diseases almost can be preventable  
100% and occupational accidents 98%!So??!!**

*“All workers have the right to safe  
and healthy working conditions.”*

**European Social Charter**

*7th edition, updated: 1st January 2015, Part 1 /3*



*Thank you for  
your participation...*



**BREATH of DEATH : SILICOSIS!**