

Lifestyle and hazards

LOCAL ENVIRONMENTAL RISKS (ENSBI303)

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Introduction

We face many hazards in our everyday life...

01

**In the
workplace**

02

**Results of
wrong
lifestyle
choices**

03

**Poor indoor
pollution in
our houses**

04

**Chemicals
in products
we use
everyday**

Occupational Hazards in the Workplace

Types of occupational hazards

Chemical Hazards

Exposure to toxic substances such as lead, mercury, and pesticides. Chronic exposure to these chemicals may lead to long-term health issues, including cancers and organ damage

Physical Hazards

Examples include noise pollution, extreme temperatures, and repetitive strain injuries. Physical strain in industries like mining and manufacturing is a major issue. Climate change directly increases physical occupational risks. For example, miners and construction workers are increasingly exposed to heat-related illnesses due to global warming. Rising sea levels and extreme weather events also endanger workers in coastal and disaster-prone areas.

Biological Hazards:

Risks from pathogens such as bacteria, viruses, and fungi, especially in healthcare and agriculture. Rising temperatures and changing ecosystems due to climate change amplify the spread of diseases like malaria and dengue, posing heightened risks to workers in outdoor environments.

Cultural Hazards

Unsafe working conditions, poverty, and lack of safety enforcement also contribute to workplace risks. Vulnerable populations working in agriculture, fishing, or forestry face compounding risks as climate change disrupts their livelihoods. Limited adaptation measures increase their exposure to both environmental and occupational hazards. Also unregulated waste disposal can expose workers to hazardous materials in informal recycling industries

Cobalt Mining:

example of environmental and occupational Hazards



Cobalt Mining:

example of environmental and occupational Hazards

Cobalt mining, particularly in the Democratic Republic of Congo (DRC), exemplifies a convergence of occupational risks and environmental issues tied to climate change mitigation efforts. Cobalt is essential for batteries used in renewable energy technologies like electric vehicles, which aim to reduce greenhouse gas emissions. However, the environmental and social costs of cobalt extraction highlight the paradox of "green technologies" relying on environmentally harmful practices

risks

- face exposure to cobalt dust --> respiratory diseases and long-term health issues (asthma, lung fibrosis, ...)
- toxic waste (with soil and water) --> ecosystem degradation
- mining runoff --> reduces agricultural productivity and water sources --> food insecurity

In-House Environmental Hazards

Indoor Air Pollution and quality

Particulate Matter (PM2.5)

Fine particles from indoor burning (e.g., cooking with solid fuels, tobacco smoke) are linked to respiratory diseases like asthma and bronchitis

Radon

A naturally occurring radioactive gas that seeps into homes from the soil. Long-term exposure is a leading cause of lung cancer after smoking

Volatile Organic Compounds (VOCs)

Emitted by paints, cleaning supplies, and furniture made from synthetic materials. Prolonged exposure to VOCs can lead to headaches, dizziness, and liver or kidney damage as global temperatures rise, the use of air conditioners and ventilation systems in homes increases, leading to higher energy consumption and the potential for worsening indoor air quality if these systems are not maintained properly. Poor indoor air quality can exacerbate existing health conditions, especially in areas where outdoor pollution is also high

In-House Environmental Hazards

Mold and Moisture Exposure

Mold Growth:

Excessive moisture due to flooding, plumbing leaks, or inadequate ventilation can lead to mold growth. Mold spores can trigger allergies, asthma, and other respiratory problems.

Water Contamination

Stagnant water in poorly ventilated areas promotes the growth of bacteria and viruses, which can lead to skin infections or gastrointestinal diseases

Increased rainfall and flooding, often linked to climate change, increase the risk of mold growth in homes. More frequent extreme weather events can lead to greater exposure to water-damaged buildings and heightened indoor health risks

In-House Environmental Hazards

Exposure to toxic materials

Lead

Older buildings often contain lead-based paints. Exposure to lead is particularly dangerous for children and can cause neurological damage, developmental delays, and behavioral problems

Flame Retardants

Chemicals used in furniture, mattresses, and carpets to reduce flammability. These chemicals have been linked to endocrine disruption, cognitive impairment, and cancer

Exposure to chemicals in daily use products

sprays, laundry degenrants, cleaning supplies and kitchen supplies

Rising temperatures may lead to the increased release of volatile chemicals in building materials, particularly as they degrade over time. Higher temperatures may also affect the integrity of building materials, leading to further exposure risks

In-House Environmental Hazards

temperatures + other

Energy Inefficiency and Temperature Extremes

With the increasing frequency of heatwaves and cold spells linked to climate change, homes that are poorly insulated or lack energy-efficient systems pose greater health risks.

Vulnerable populations, such as the elderly and children, are especially at risk from extreme temperatures

Use of non-proper heating and cooking

like indoor fires... (mostly in third world countries)



In Jocotenango, Guatemala, Rosa de Sapeta's family used to avoid her smoke-filled kitchen. But since an aid group helped her replace the open fire with a cleaner burning stove, she says, "I have company while I cook."

PHOTOGRAPH BY LYNN JOHNSON

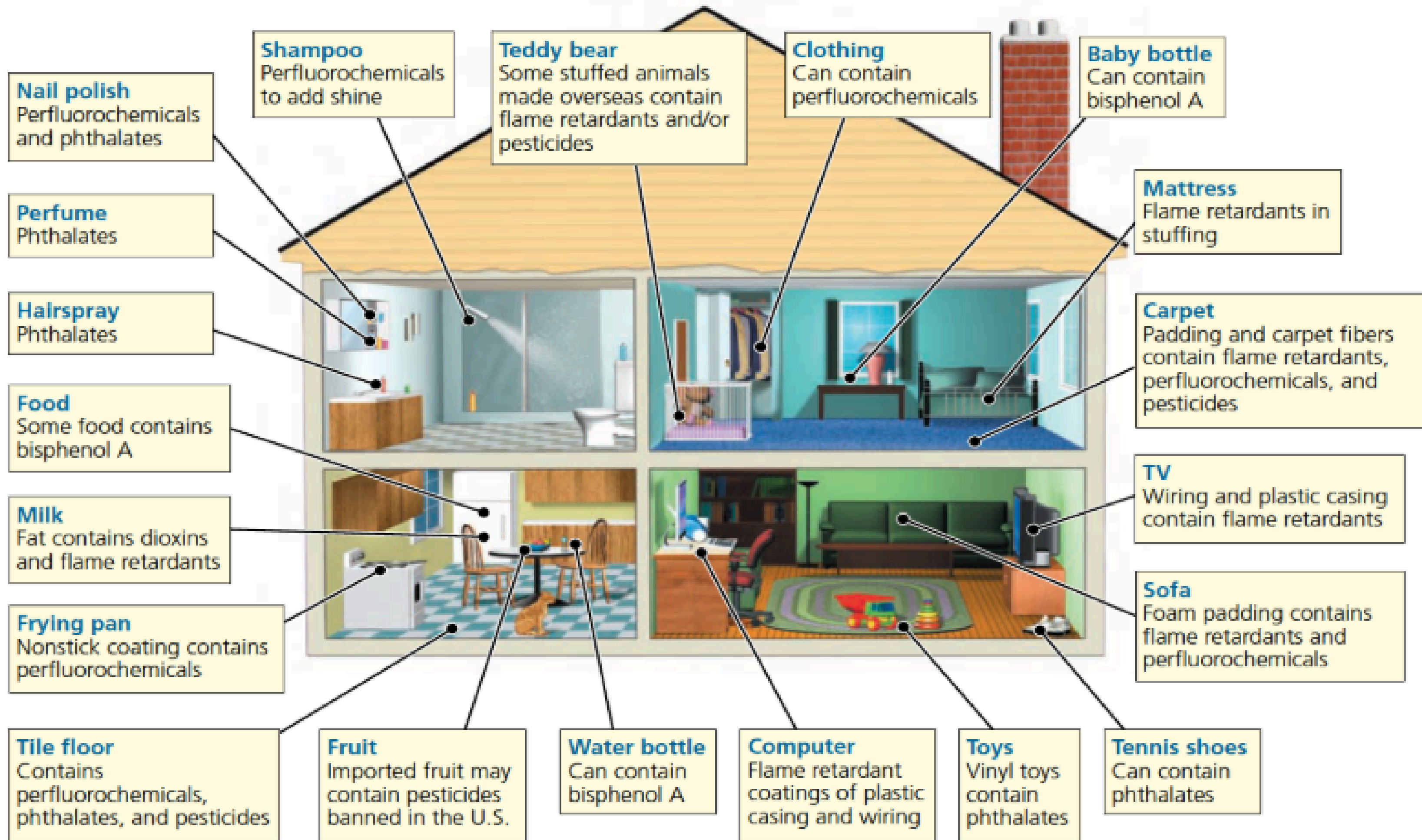
PHOTOGRAPHY

DISPATCHES

Three Billion People Cook Over Open Fires — With Deadly Consequences

In Guatemala, locally made cookstoves are helping combat toxic smoke—but economics and tradition keep many people from using them.

By Michelle Nijhuis



Mitigation Strategien

Mining industry

- implementing safety protocols and providing proper training for employees
- Wearing personal protective equipment (PPE) such as hard hats, gloves and safety glasses
- Regular health check-ups
- Install engineering controls like isolation rooms or sound barriers, ventilation systems

Better Mining Initiative

- Operating in Democratic Republic of Congo or Rwanda
- Their team monitors mining sites, implements better ventilation, provides protective gear, and limits exposure to toxic substances such as cobalt dust, which can cause respiratory problems
- Seeks to educate about the risks and protective equipment that are necessary when working in the mine
- Implementation of training and policies that lead to a decrease of health and safety incidents

European Directive 2000/54/EC on “The protection of workers from risks related to exposure to biological agents at work”

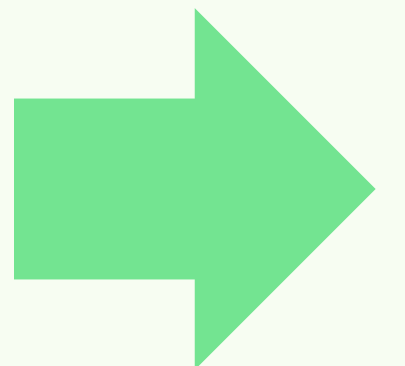
- **Health and safety in professions where there is a risk of contact with biological agents such as microorganisms, viruses, bacteria, and parasites - such as agriculture or healthcare**
- **Rules for employers :**
 - Assessment of the risks, implement preventive measures
 - Provision of collective protection equipment (e.g. isolation systems) and personal protective equipment (masks, gloves or protective clothing)
 - Implementation of rules for hand washing, decontamination and safe handling of biological material.
 - Training and informing of employees
 - Implementation of safe procedures for the collection, storage and disposal of waste contaminated with biological agents

Workplace heat exposure - Mitigation measures

- **Bahrain:** The Ministry of Labour implemented measures that regulates working hours outdoors. So the workers are not allowed to work outdoors between 12:00 and 16:00 from July 1 to August 31 each year.
- **Oman:** The Noon Work Stoppage- forbids working outside from 12:30 to 15:30 between June 1 and August 31, particularly on construction sites.
- **Greece:** Work halts at specific heat levels (e.g., 32.5°C for low-intensity work, 30°C for very high-intensity work).
- Measures include work scheduling in cooler hours, improved ventilation, shaded rest areas, and training for workers on heat risks
- in 2023 applied during a 14-day heatwave

Strategies for reducing exposure to household air pollution

- Technologies fueled by solar, electric, biogas, liquefied petroleum gas, and alcohol (e.g., ethanol), biomass stoves with a specified emission level are considered clean.
- Ventilation such as chimneys or hoods - ventilation works best when combined with low-emission stoves and greener fuels.
- Strategic placement of windows, insulated walls, and reflective roofs which helps reduce demand for space heating in cool climates.
- Some plant species are able to absorb air pollution such as Volatile Organic Compound (VOC)





Areca palm
Dypsis lutescens

Filters pollutants like xylene, carbon monoxide, formaldehyde, trichloroethylene, toluene from the air



Rubber plant
Ficus elastica
Filters formaldehyde from the air



Peace lily
Spathiphyllum wallisii
Filters formaldehyde, xylene, benzene, ammonia and trichloroethylene from the air



Spider plant
Chlorophytum comosum

Filters formaldehyde, xylene, toluene, benzene, and carbon monoxide in from the air homes or offices.



Boston fern
Nephrolepis exaltata

Filters formaldehyde, xylene and toluene from the air



Chrysanthemum
Chrysanthemum morifolium

Filters benzene, xylene, toluene formaldehyde, trichloroethylene from the air



Golden pothos
Epipremnum aureum

Filters formaldehyde, trichloroethylene, toluene, xylene, and benzene from the air



Weeping fig
Ficus benjamina

Filters xylene, formaldehyde, toluene from the air



Snake plant
Sansevieria trifasciata Prain,

Filters formaldehyde, trichloroethylene, toluene, xylene, ammonia, benzene and carbon dioxide from the air



Gerbera daisy
Gerbera jamesonii

Filters benzene, formaldehyde, and trichloroethylene from the air



Aloe vera
Aloe vera L.

Filters benzene, formaldehyde from the air

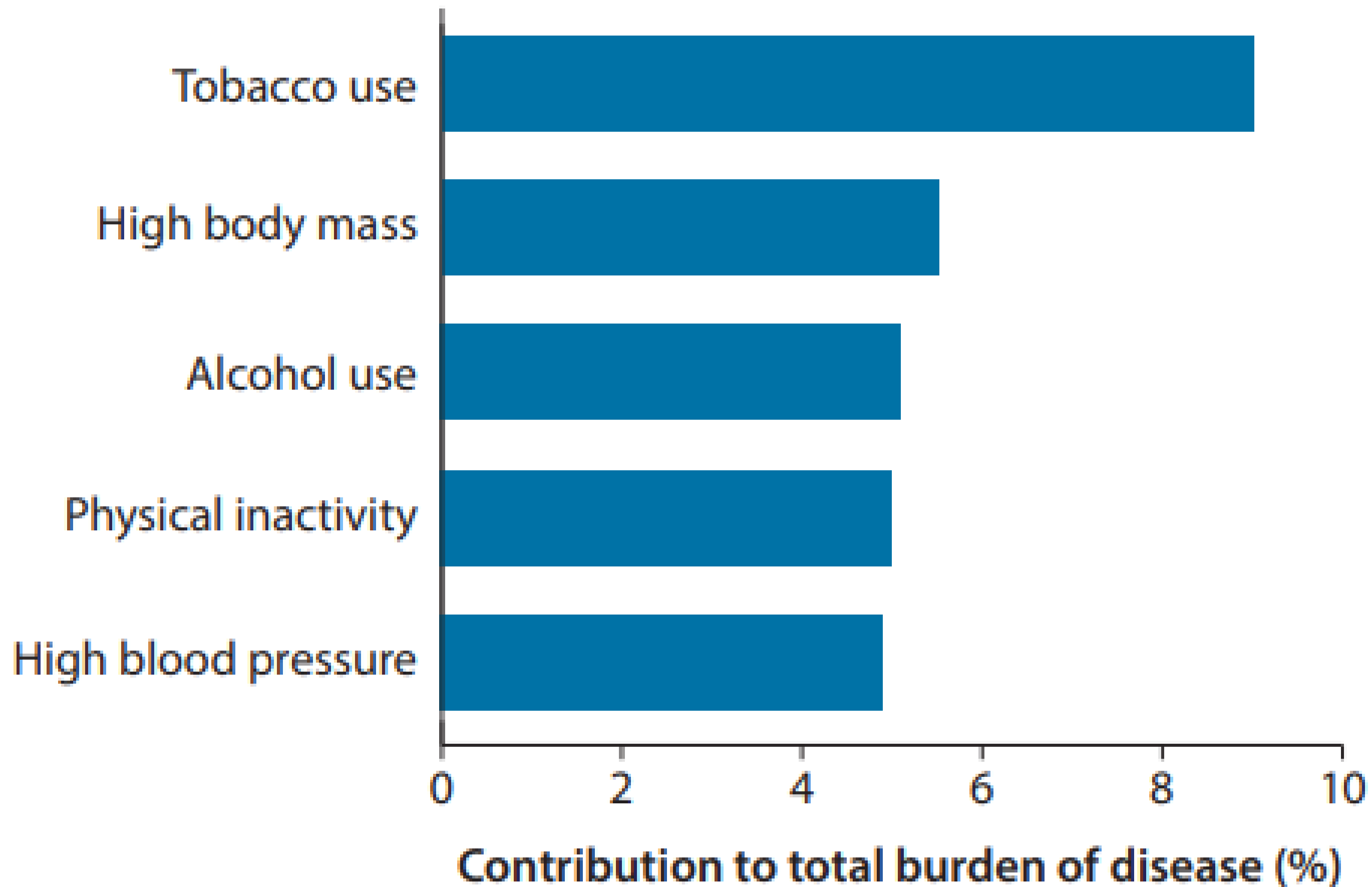
Reach

- 2007, European Union
- Registration, Evaluation, and Authorization of Chemicals
- Every manufacturer or importer of a chemical substance in quantities greater than 1 tonne per year must register the substance with the European Chemicals Agency (ECHA).
- All chemicals are subject to the regulation - industrial production, used in everyday life (such as paints, cleaning agents, washing powders, etc., as well as those contained in finished products, e.g. furniture, clothing, appliances)
- Evaluated by ECHA
- Substances of greatest concern require authorization
- Unacceptable risk to health or the environment -> may be limited or prohibited

everyday

Lifestyle choices

that affect your health



talking to your friends

STROKE STUDY

- People with fewer social connections -> slightly more likely to have a stroke
- strong social connections --> recover better
- emotional support --> improves recovery

**eating
an
apple**

**AN APPLE A DAY
KEEPS THE
DOCTOR AWAY**

- reduces the risk of **chronic diseases** (heart disease, diabetes or certain cancers)
- **gut health**
- improve **cardiovascular function**
- contain powerful antioxidants that protect cells
- have anti-inflammatory properties.

talking a walk

WALKING GREEN

- improves mental health
- reducing stress
- boosting mood
- lowering blood pressure, supporting heart health
- improving fitness.

Regular physical activity in green spaces enhances overall well-being, emphasizing their **value in daily routines.**

looking at nature

THE NATURE OF THE VIEW

This study shows that having a view of nature from home --> improves well-being and satisfaction with the living environment.)

- feel more peaceful, focused, and effective while reducing mental fatigue.
- xxx busy streets or built structures negatively affect satisfaction.

taking a nap

BREAK DURING THE DAY

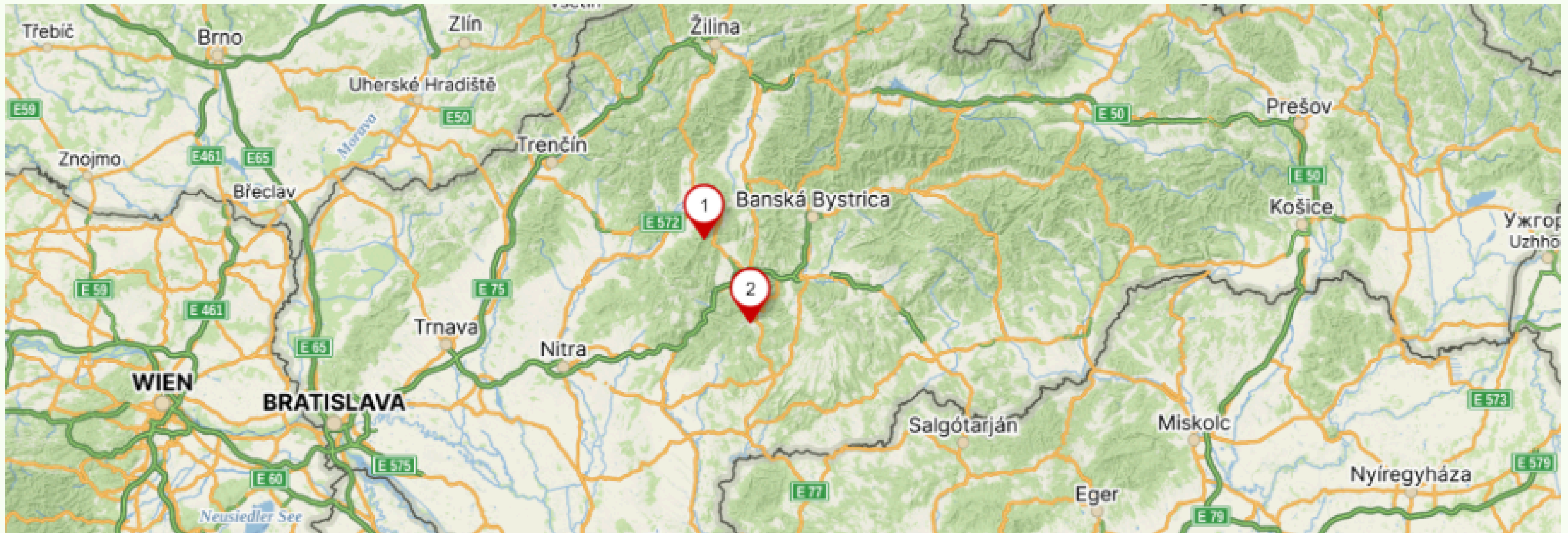
Short naps (10-20 minutes) are especially effective for **improving alertness** and avoiding grogginess, while longer naps may provide additional benefits after some delay.

- **Enhanced Physical Recovery**
- **Cardiovascular Benefits**
- **Better Cognitive Performance**

Case study:
Environmental hazards
posed by mining in Slovakia

1) Mining tragedy in Handlová 2009

2) Environmental problems of mining region



- **Occupation with one of the highest fatality rates in Slovakia**

- 8-10 deaths / year

- **Slovakia is one of the most dangerous countries for miners**

- 1 death / <1 million tons of coal a year

- (USA – 1 death / 30-35 million tons of coal a year)

- (China – 1 death / 700-800 thousand tons of coal a year)

- **Hazards: physical, chemical, biological, ergonomic, psychosocial**

- **Industry with extensive impact on region**

- degradation of biotopes

- contamination of water and soil

- emission of greenhouse gases

- air pollution

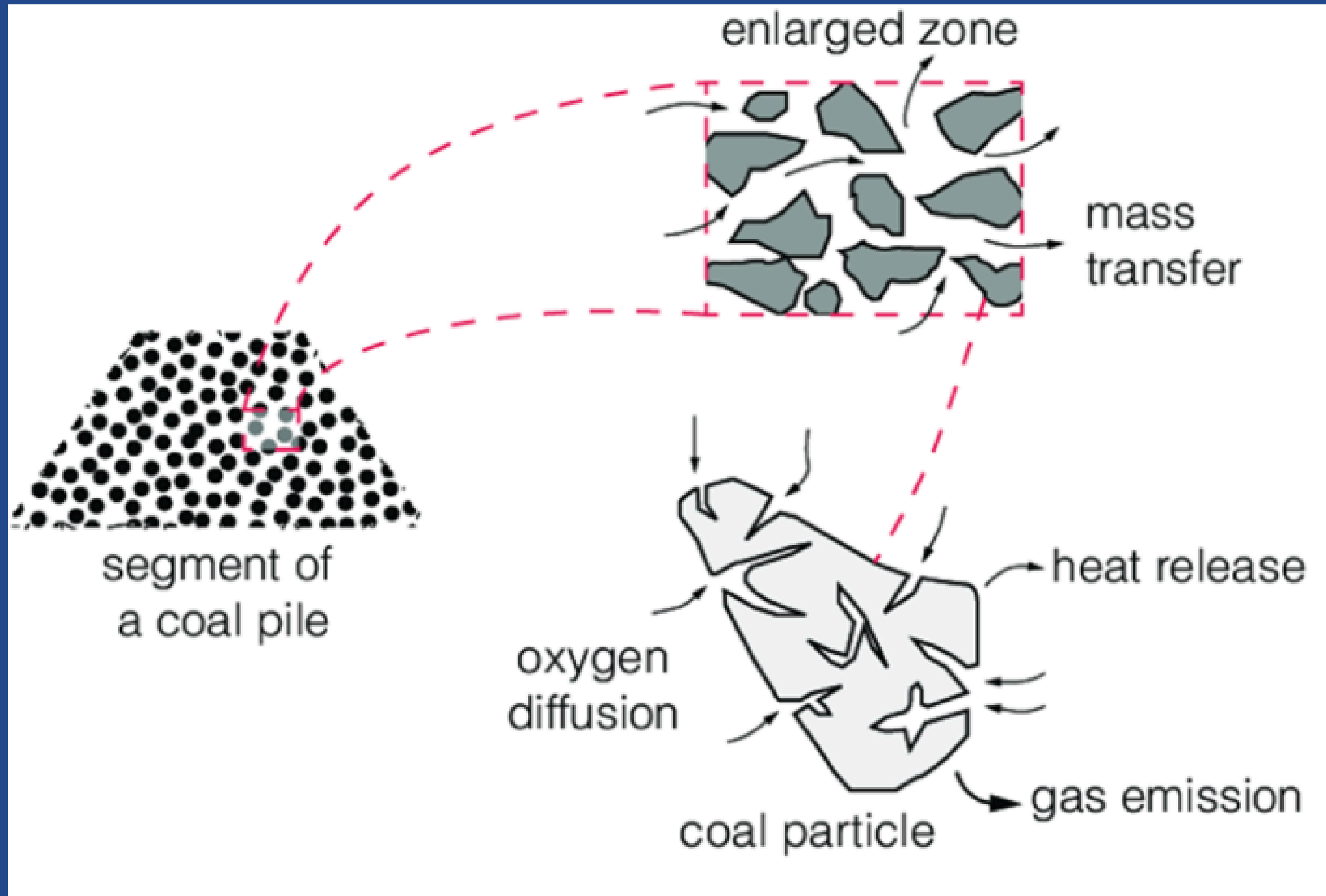


1) Mining tragedy in Handlová 2009

- Eastern shaft shut down in 1991, later reopened
- 10. august 2009
- 20 casualties



Oxidation of coal releases methane





2) Environmental problems of mining region – Banská Štiavnica



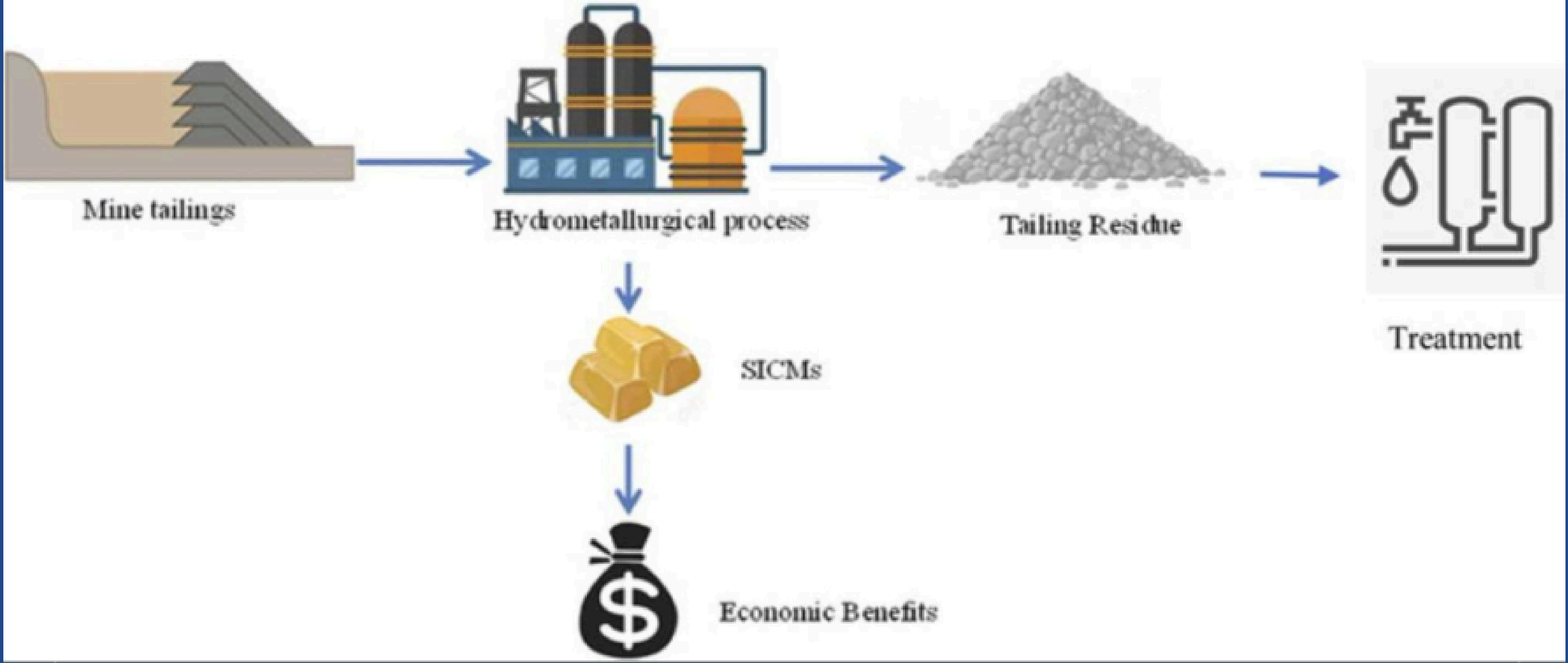
- **town with longest mining history in Slovakia**
- Celts were mining and processing rare metals since the 3. century B.C. (silver, gold)
- In the 10. century town's mining industry gained on significance because of easily accessible ores
- Productivity of town's mining activities reached it's peak during the 16th century



- The valleys below the heaps have experienced a gradual decline in soil fertility
- Situation assessed as an ecological disaster
- Source of these disasters was extremely acidic water, resulting from the decomposition of sulfides
Bacteria, algae, molds, and fungi also significantly contribute to the bio-oxidation of sulfides and oxides.



- **In past centuries the extraction of ore relied solely on human muscle power using chisels and hammers.**
 - limited volume of material moved
 - rock fragments relatively intact ▸ smaller reactive surface
- **The introduction of chemical explosives marked a leap in mining development**
 - reduced costs, accelerated excavation, and increased the volume of extracted materials
 - fragments crisscrossed with shock-induced cracks ▸ bigger reactive surface





Let's test
what you learned!

Quiz code:

00894781



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**Thank
You.**