

Environmental health

Environmental health

Your health depends on the environment around you. Environmental health is the study of how the environment affects human health. It differs from the study of how humans affect the environment, because it focuses on people's health. An environmental scientist might study how water pollution is hurting fish. An environmental health scientist would study what happens to the health of people when they catch and eat those fish. Environmental health is not just about the health of the environment – it always comes back to you and whether the environment you are part of is helping you stay healthy, or making you sick."

Environmental health

- CDC' definition “environmental health is the discipline that focuses on the interrelationships between people and their environment, promotes human health and well-being, and fosters a safe and healthful environment”
- Source book: Environmental Health – From Global to Local, editor Howard Frumkin 2005.
- There is no question that the environment impacts the health of individuals and communities.
- It is easy for us to grasp that chemical spills in our water supply has an impact on the safety of the water we drink;

Environmental health

- The understanding of all of the environmental Physical, chemical, biological and psychosocial factors external to a person – is a special field within the world of public health.
- Environmental factors or hazards like water and air pollution, extreme weather, or chemical exposures can impact human health in a number of ways, from contributing to chronic diseases like asthma, developmental disabilities, and cancer or acute illnesses like heat exhaustion, food, carbon monoxide, and childhood lead poisoning.

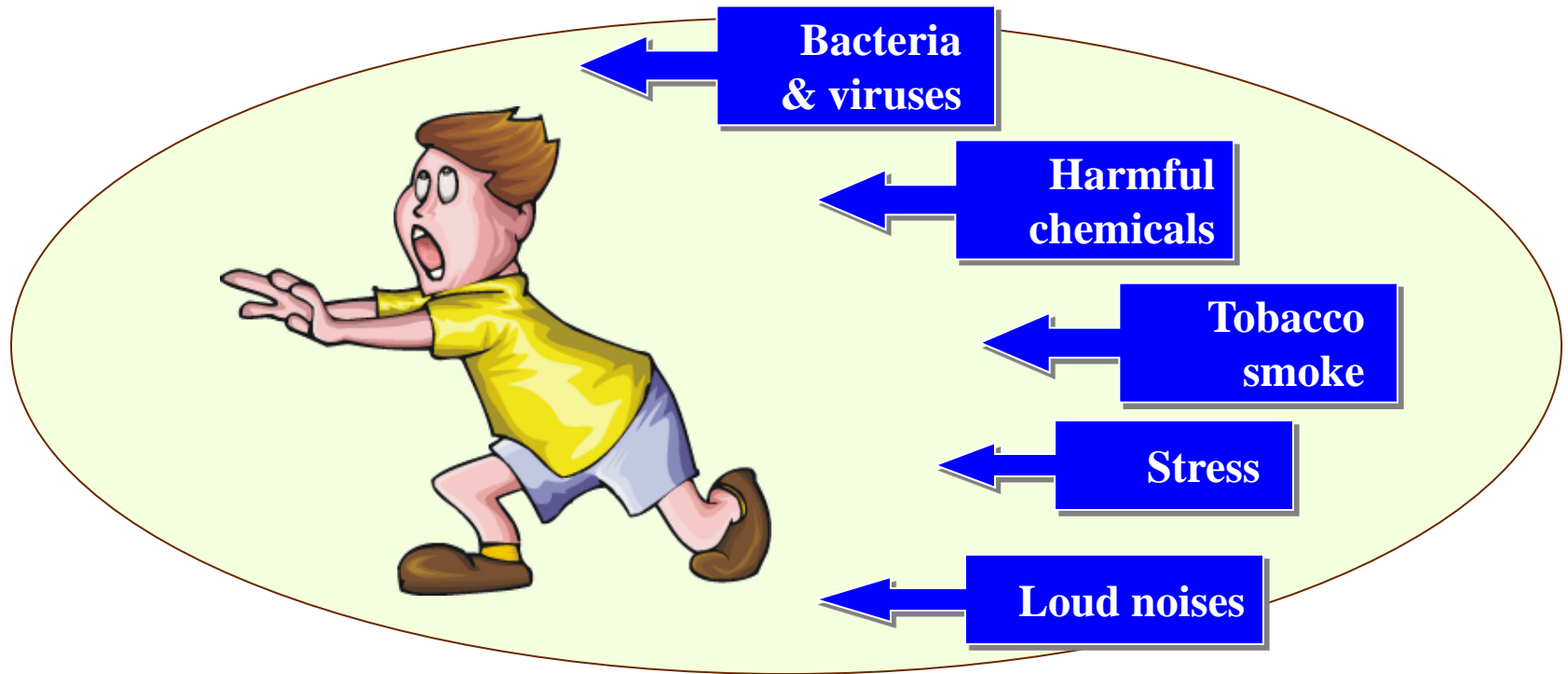
An environmental health hazard

- An environmental health hazard is a substance that has the ability to cause an adverse health event. This includes physical, chemical, biological and psychosocial factors that are external to a person.

An environmental health hazard

- Hazards can be natural or manmade. Examples include:
Air, water, and soil pollution from transportation,
agriculture, industry, and other sources such as:
- Chemicals • Toxic waste • Radiation
- Disease-causing microorganisms and plants • Pesticides •
Heavy metals • Climate
- Extreme temperatures and weather events
- Where you live – home and community design
- Chemicals in consumer products

Hazards



A hazard is anything in the environment that can hurt you or make you sick.

CONCEPT OF DISEASE

Disease result from complex interaction between man, an agent and the environment.

From ecological point of view disease is defined as “maladjustment of the human organism to the environment”.

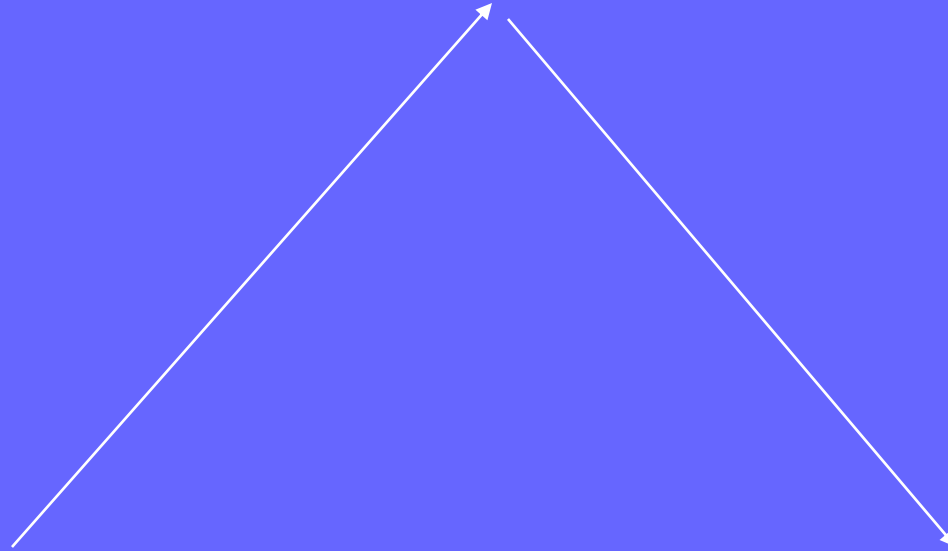
ENVIRONMENTAL IMPACT

Environment

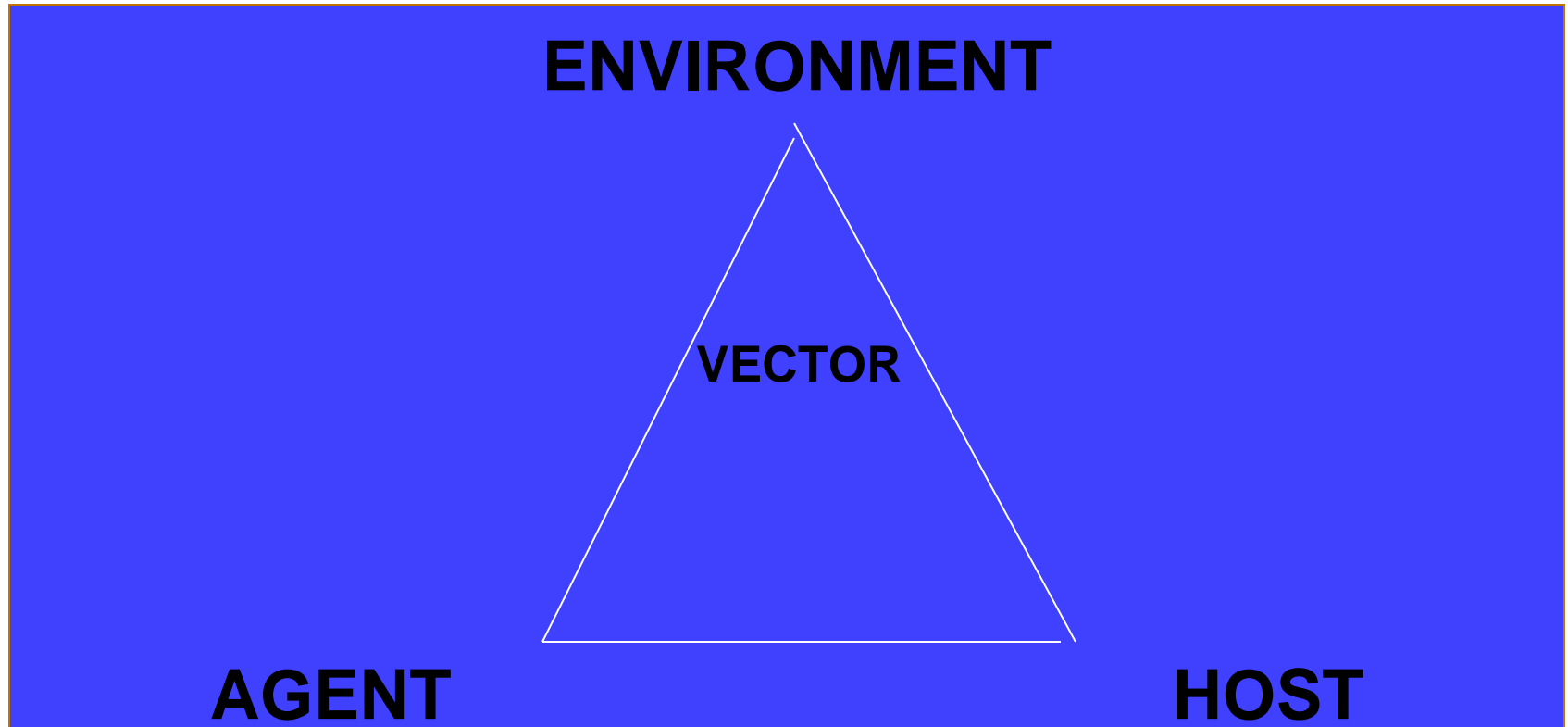
(Physical, biological and psychosocial)

Human activities

health of individual



EPIDEMIOLOGICAL TRIAD



ENVIRONMENT

All that which is external to man is the environment broadly speaking. The concept of environment is complex. *The external environment or the Macro-environment* is said to be responsible for millions of preventable diseases originating in it.

Micro-environment is the Domestic environment in which man lives. The term *Internal environment* is some time used for the environment inside the body

EXTERNAL ENVIRONMENT:

“All that is external to the individual human host, living and non-living, and with which he is in constant interaction”.

COMPONENTS OF ENVIRONMENT:

PHYSICAL: air, water, soil, housing, climate, geography, heat, light, noise, radiation, etc.

BIOLOGICAL: man, viruses, microbial agents, insects, rodents, animals and plants, etc.

PSYCHOSOCIAL: cultural values, customs, beliefs, habits, attitudes, morals, religion, education, lifestyles, community life, health services, social and political organization.

The environment is all external conditions, circumstances, and influences surrounding and affecting the growth and development of an organism or community of organisms.

Environmental health is the study and management of environmental conditions that affect the health and well-being of humans.

Environmental hazards

Environmental hazards may be biological, chemical, physical, psychological, sociological, or site and location hazards.

Biological hazards

These are living organisms or their products that are harmful to humans

A. Water-borne diseases are diseases that are transmitted in drinking water

- 1. Examples are polio virus, hepatitis A virus, Salmonella, Shigella, cholera, amoebic dysentery, and Giardia.**
- 2. These disease organisms are shed into the water in feces, and can produce illness in those who consume untreated, contaminated water.**
- 3. Water treatment facilities are usually able to purify water by removing these agents or killing them by disinfecting the water.**

B. Food-borne diseases

are diseases transmitted in or on food

- 1. Examples of food-borne agents are the bacteria Salmonella, Escherichia, as well as other agents.**
- 2. To protect against food-borne diseases, sanitarians from the ministry of health and FDA routinely inspect food service establishments (restaurants) and retail food outlets (supermarkets) to verify that food is being stored and handled properly.**

C. Vector-borne diseases

are those transmitted by insects or other arthropods

- 1. Examples are encephalitis transmitted by mosquitoes and plague and typhus transmitted by fleas.**
- 2. Improper environmental management can cause vector-borne disease outbreaks.**

II. Chemical hazards

Mismanagement or misuse of chemicals leads to an unacceptable risk to human health

A. Pesticides are chemicals that have been manufactured for the purpose of reducing populations of undesirable organisms (pests)

- 1. Examples of categories of pesticides are herbicides and insecticides.**
- 2. Most pesticides kill non-target organisms as well as the target, or pest species.**
- 3. The wise use of pesticides can protect human health and agricultural crops.**

Pesticides

- **Misuse of pesticides can result in illness and death.**
- 5. Some of the pesticides developed earlier in the 20th Century, such as DDT, were persistent, that is they remained in the environment for months or years after their initial use.**
 - 6. Newer pesticides are less persistent in the environment.**

B. Environmental tobacco smoke (ETS)

is an environmental hazard produced by millions that smoke

- 1. Diseases associated with ETS include lung cancer and cardiovascular diseases.**
- 2. ETS is a carcinogen.**
- 3. Smoking has been increasingly restricted from public buildings and from many private work sites.**
- 4. Regulation of smoking seems to be the best approach to controlling this pollutant**

C. Lead

is a naturally occurring element that is used in the manufacturing of many industrial and domestic products

1. Health problems associated with the over exposure to lead are anemia, birth defects, bone damage, neurological damage, kidney damage, and others.

2. Exposure is by ingestion and inhalation.

3. Children are particularly at risk from eating peeling lead paint.

4. Occupational exposure is a major source of lead intake for adults.

5. Solutions for the prevention of lead poisoning include education, regulation, and prudent behavior.

II. Physical hazards

include airborne particles, humidity, equipment design and radiation

A. Radon contamination results from over exposure to radon gas.

1. Radon gas arises naturally from the earth and sometimes occurs at dangerous levels in buildings and homes.

2. Breathing in radon gas can cause lung cancer.

Ultraviolet radiation

- **Ultraviolet radiation reaches humans as short wave length energy that can damage cells by ionization.**
 - 1. One result of over exposure to UV radiation is skin cancer.**
 - 2. People should reduce their exposure to UV radiation.**
 - a. Stay inside**
 - b. Wear protective clothes or sunscreen**

III. Psychological hazards

are environmental factors that produce psychological changes expressed as stress, depression, hysteria.

IV. Sociological hazards

are those that result from living in a society where one experiences noise, lack of privacy and overcrowding.

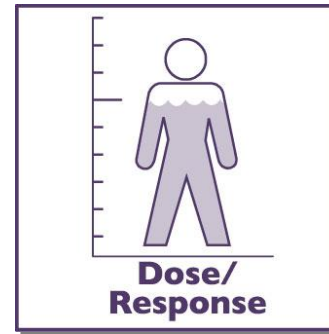
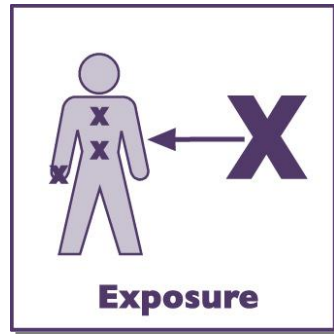
A. Population growth may be a sociological hazard.

V. Site and Location Hazards

A. Natural disasters are geographical and meteorological events of such magnitude and proximity to communities that they produce significant damage and injuries.

- 1. Examples are cyclones, earthquakes, floods, hurricanes, tornadoes, typhoons, and volcanic eruptions.**
- 2. The magnitude of devastation of these events can sometimes be great.**
- 3. Biological, psychological and sociological hazards may increase following a natural disaster.**

The 7 Core Concepts







Toxicity

Toxicity

Most people working in environmental health-related jobs have taken classes in the science of **toxicology**. Toxicology is the study of how environmental hazards, such as natural and human-made chemicals, can enter our bodies and make us sick.

- When scientists study different chemicals in the environment to see if they might be dangerous to humans, they are trying to understand the **toxicity** of those chemicals.

A Toxicity Scale

Toxicity Rating	Signal Words on Package	Symbol on Package
Highly Toxic	DANGER or POISON	
Moderately Toxic	WARNING	
Slightly Toxic	CAUTION	
Not Toxic	none	

Example.

Toxicity Rating

Highly Toxic



Moderately Toxic

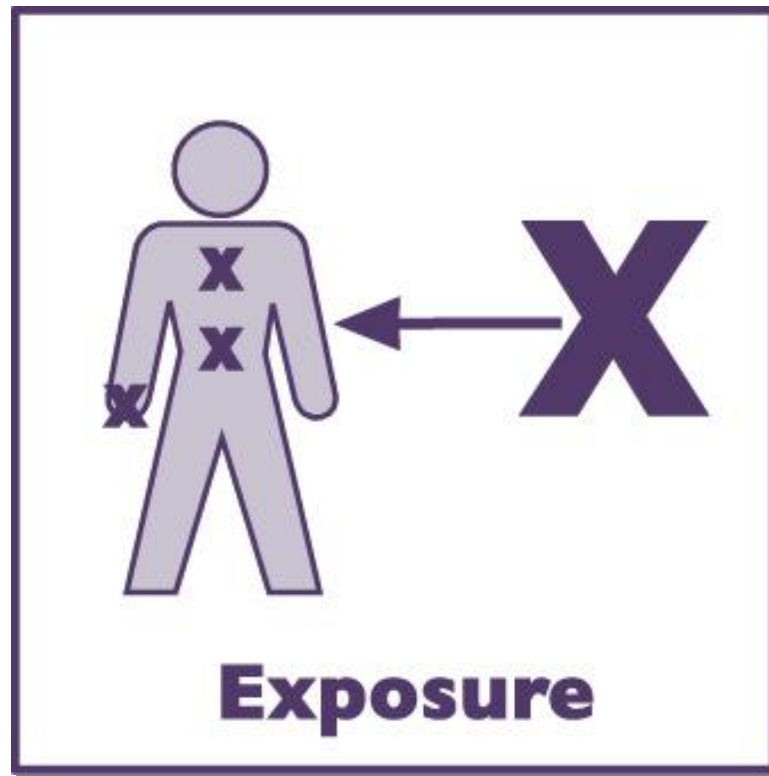


Slightly Toxic

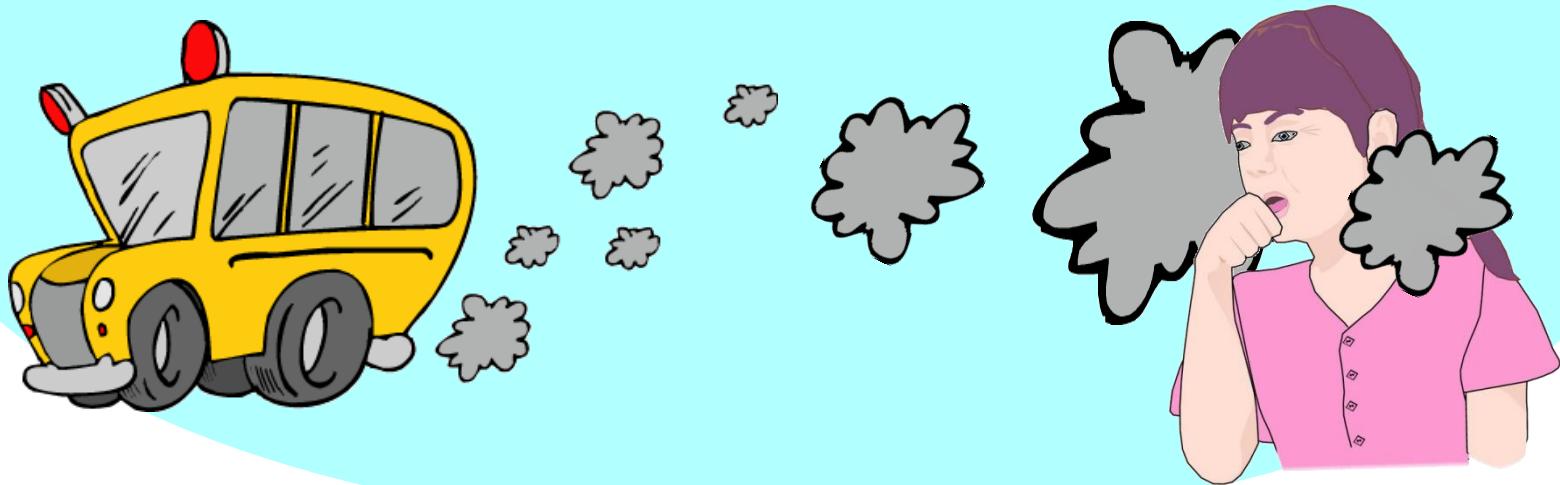


Not Toxic





Exposure is



Exposure is

- Everyday our bodies are exposed to all sorts of environmental hazards, such as bacteria, viruses, and the sun's ultra-violet (UV) rays. Some of these hazards exist naturally and some of them are the result of human activities. There are many possible **sources** of hazards, such as cars, industry, even volcanic eruptions. In order for us to be exposed, however, the hazard has to get from the source to us. To do this, it travels along an **environmental pathway**. Pathways include the air we breathe, the water we drink, the food we eat, and even the soil we work in, play in, and use to grow much of our food.
- Environmental health scientists use the term **exposure** to describe the total amount of a hazard that comes in direct contact with your body.

The 3 parts of exposure

The
Source
of the hazard
(bus exhaust)

The
**Environmental
Pathway**
(air)

The
Contact
(inhaled fumes)

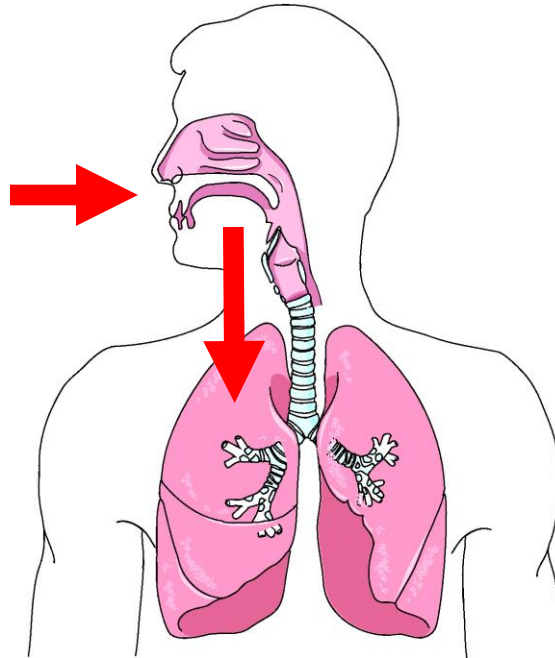


Which route will the hazards take?

Once you have come into contact with a hazard, it can get into your body through different routes. You can breathe it in (**inhalation**). You can eat or drink it (**ingestion**). You can get it directly on your skin or in your eyes (**dermal absorption**). You can also get it directly into your body through an injection. Inhalation, ingestion, and dermal absorption are the three main **routes of exposure**. Things that help us stay healthy, like vitamins, nutrients, and medicines, enter the body through these routes of exposure, but hazards can use these same routes to enter the body and make us sick.

Route #1: Inhalation

Hazard!

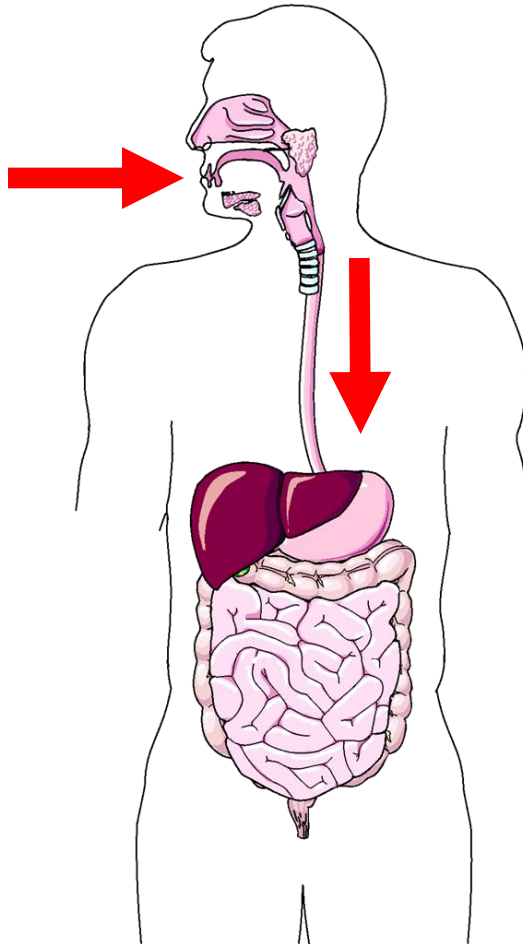


Inhalation:

Breathing. When chemicals enter the body through this route of exposure, they can get stuck in the lungs and/or be taken up into the bloodstream.

Route #2: Ingestion

Hazard!

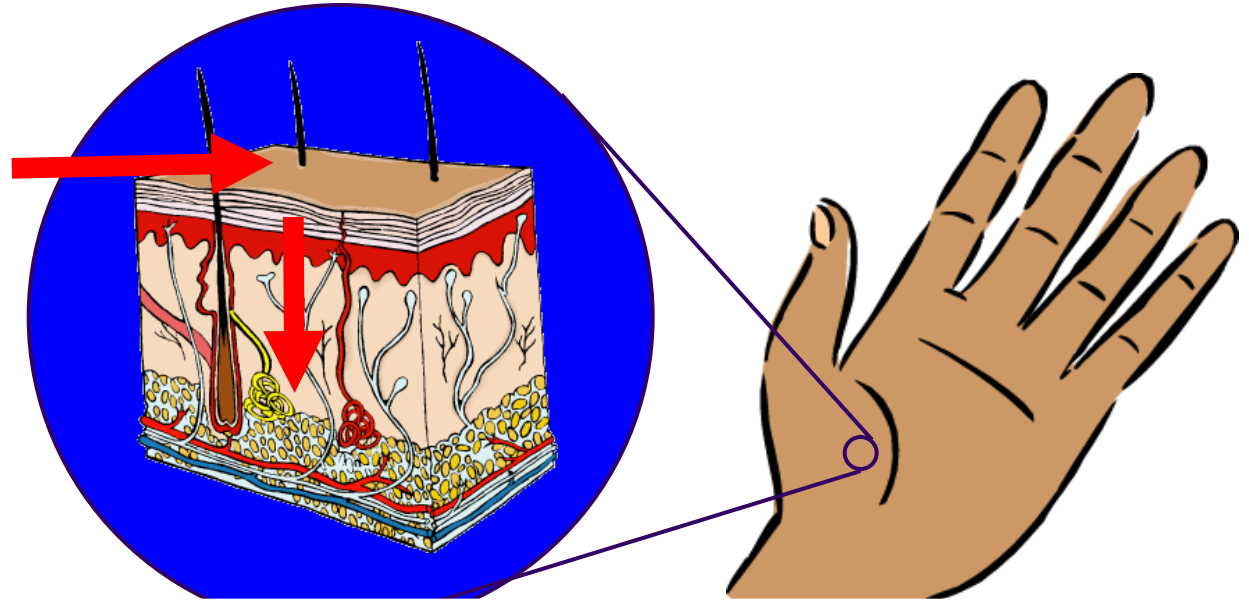


Ingestion:

Swallowing (usually by eating or drinking). When chemicals enter the body through this route of exposure, they can easily be taken up into the bloodstream.

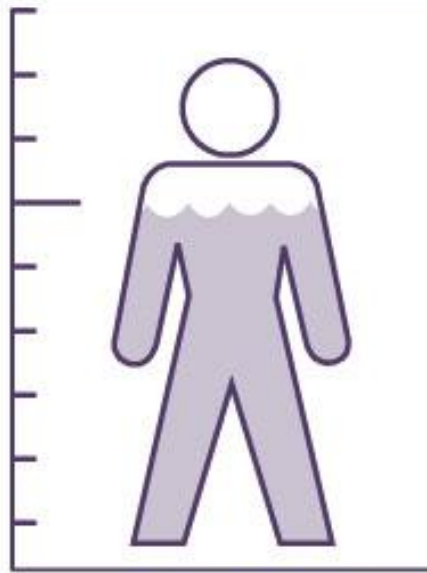
Route #3: Dermal Absorption

Hazard!



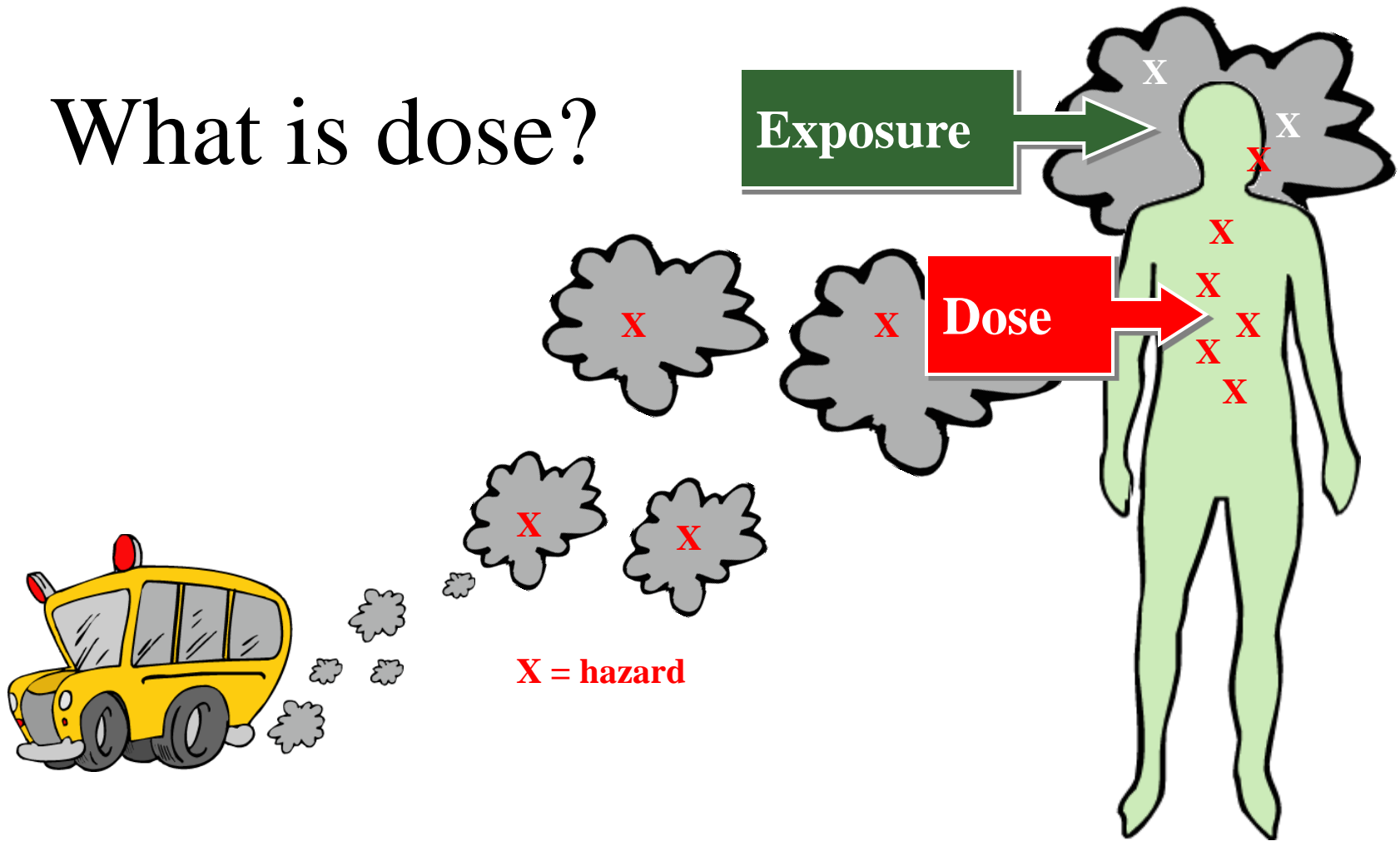
Dermal Absorption:

Absorbing a chemical through any part of the **skin**, including the eyes. When chemicals come in contact with the skin, they can sometimes enter the bloodstream through this route of exposure.



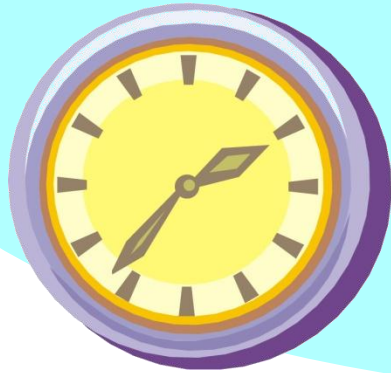
**Dose/
Response**

What is dose?

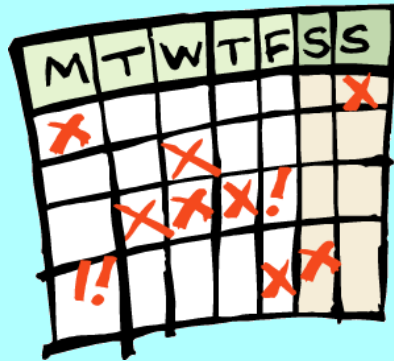


Dose can depend on...

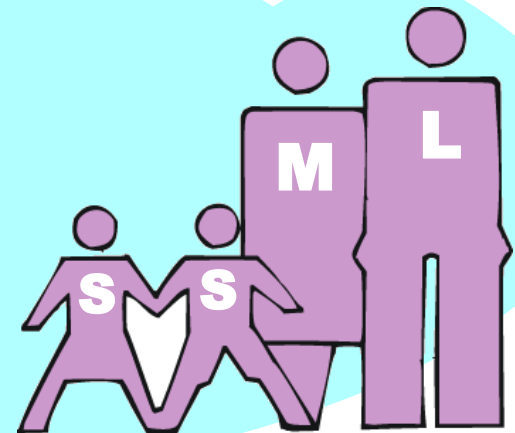
Duration of Exposure:
How long?



Frequency of Exposure:
How often?



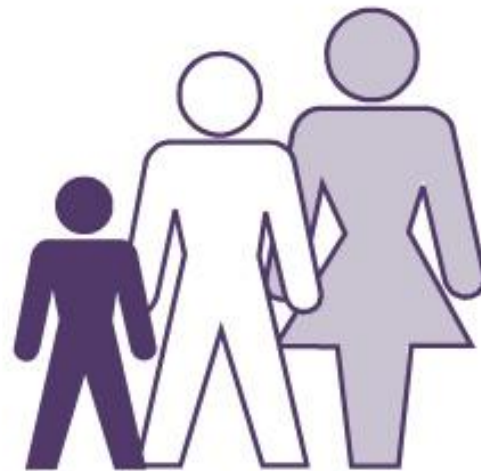
Body Size:
How big or small are you?



Dose/Response Relationship

Dose can also depend on how big or small you are. When a doctor prescribes a medicine for you, he or she calculates the amount of the medicine you should have based on your body size. The doctor can then give you the correct dose of the medicine for your body weight. While a teaspoon of medicine might be right for an adult, it may be far too large of a dose for an infant.

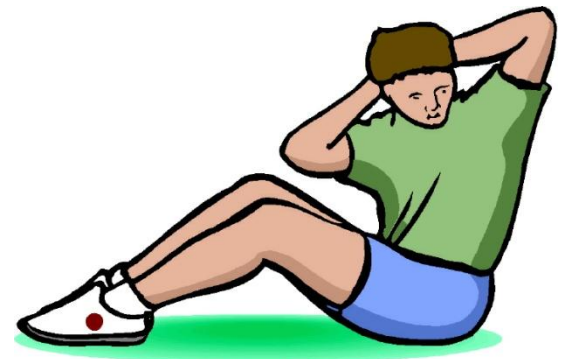
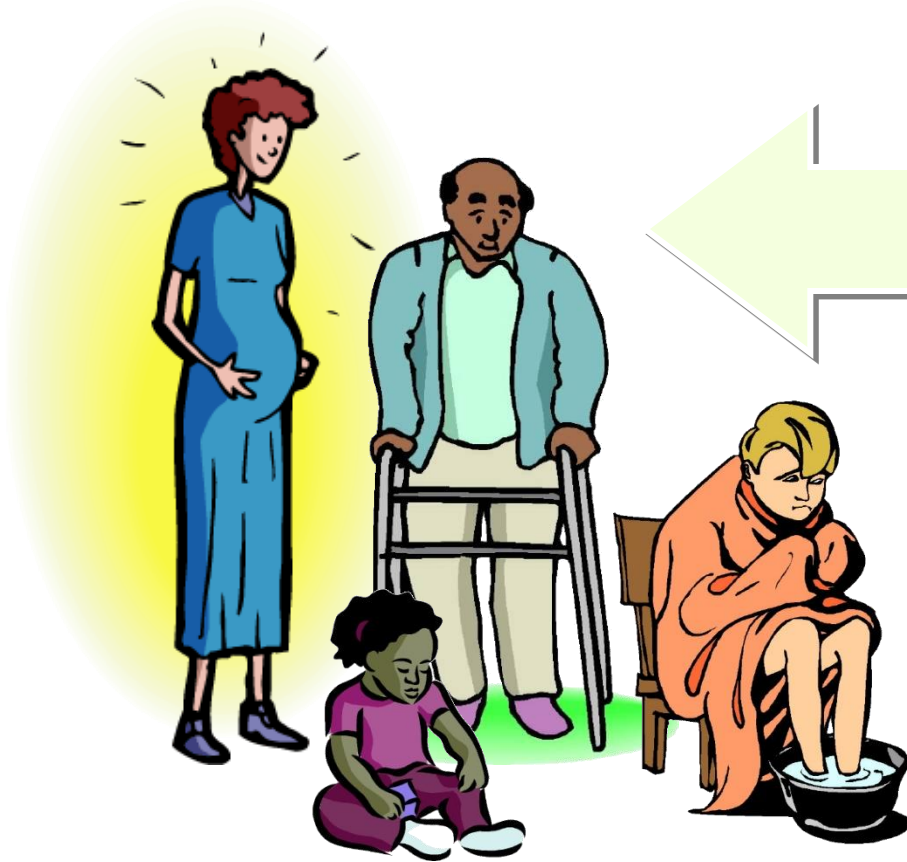
- The dose you receive can influence how your body responds to a hazard. For most hazards, the larger the dose, the more extreme the **response** will be. The smaller the dose, the more mild the response will be. Drinking one can of a caffeinated soda might be fine. Drinking three cans in a row may make you jittery. Drinking five cans of soda might make you feel light-headed and sick.



**Individual
Susceptibility**

Individual Susceptibility

Why are these people more likely to be harmed by exposure to a hazard than the man below?



Individual Susceptibility



“Some people are more likely than others to get sick when they are exposed to environmental hazards. This might be because of their **genetics**, body size, age, gender or general health. This is called their **individual susceptibility**.”

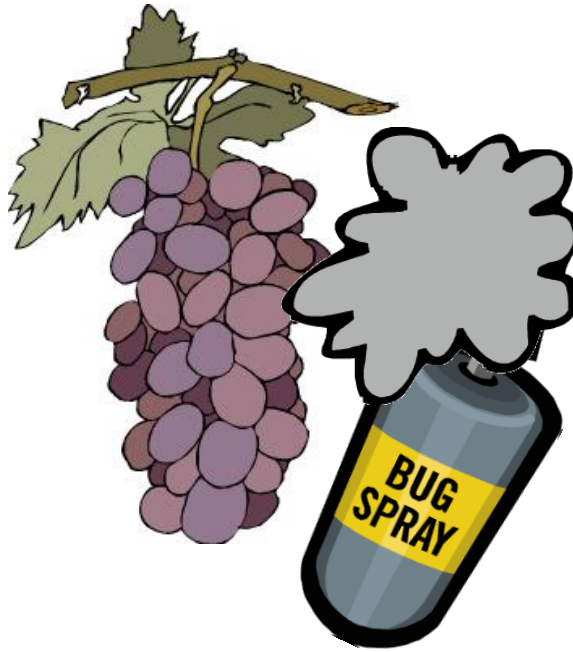


Risks & Benefits

Risks & Benefits

BENEFITS

- No bugs!
- Better looking fruit that is more visually appealing
- Bigger crops so farmers can make more profit



RISKS

- People ingest pesticides with the fruit and get sick
- Pesticides get into dirt and water
- Animals ingest pesticides and get sick



**Environmental
Justice**

What is environmental justice?



Environmental Justice (EJ) means that everyone has a right to live in an environment that doesn't make them sick, regardless of their race, culture, or income.

The EJ Process

Who is
producing the
hazard?

Who is being
exposed?

Who are the
decision
makers?

Establish a dialog
between the decision
makers, scientists,
and the affected
community.

Empower community
members to bring
about change.

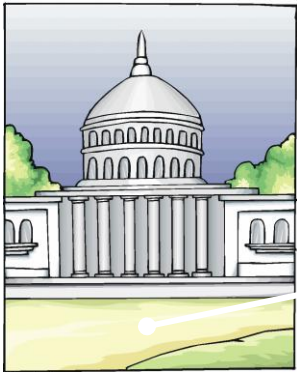
Share information and
decisions with
community members





**Community
Resources & Action**

Where can you go for information?



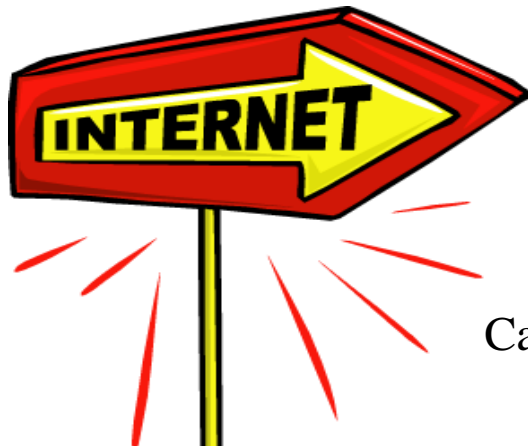
Government agencies



Schools
Libraries
Universities



Doctors
Nurses
Hospitals
Health Department



Caution!

Can you take action at the individual level?

Once you have gathered your resources and studied the issue carefully, you can take action! If you are concerned about air pollution, for example, you might decide to walk to school instead of getting a ride in a car.

Environmental public health

- Effective practice of environmental public health calls upon us to address the environment in which a person lives in a comprehensive way if we are to make significant strides in reducing morbidity and mortality. This type of response requires three areas of emphasis:

Surveillance and tracking

- We need to track disease incidence and outcomes, and link this to exposures at the local level.
- To truly understand the interplay between changes to our environment and human health, we need data collected continuously that monitors environmental factors (not just food, air, water, and housing, but the other environmental factors described previously), environmental exposures, and human disease rates.

Surveillance and tracking

- Such a system should be aimed at the local level, if not the individual home, and should include biomonitoring data to better characterize individual exposures.
- We need to use this data to understand complex interacting exposures.

Research

- Having data is not enough. We also must extract knowledge from these data to take appropriate actions.
- This will require the analysis and interpretation of the surveillance and tracking data in ways that allow us to build models that can estimate disease risks in real time; predict trends in the data that can be used to optimize personal, local, district, and national strategies; and suggest hypotheses that can be followed up through additional scientific studies.

Implementation

- Translating knowledge about environmental health risks into active strategies to reduce health risks is always a challenge.
- Regulations are useful and should be continued where appropriate. However, much of what protects and enhances our health happens at our kitchen tables.

Implementation

- The everyday, personal choices we make about such factors as the quality of our indoor air, the types of food we eat, whether we smoke or drink alcohol, and whether we filter our water can have a profound effect on our health. Devising ways that empower people to create a healthy environment in which to live is a challenge that needs to be addressed.

What is a green house gas?

- A **greenhouse gas** is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, **greenhouse gases** are responsible for the **greenhouse** effect, which ultimately leads to global warming.

Why Carbon dioxide is a greenhouse gas?

- Those **gas** molecules in the Earth's atmosphere with three or more atoms are called "**greenhouse gases**" because they can capture infrared energy, thereby warming the planet. The **greenhouse gases** include water vapor with three atoms (H_2O), ozone (O_3), **carbon dioxide** (CO_2), and methane (CH_4).

Climate change

- Over the last 50 years, human activities – particularly the burning of fossil fuels – have released sufficient quantities of carbon dioxide and other greenhouse gases to trap additional heat in the lower atmosphere and affect the global climate.
- Sea levels are rising, glaciers are melting. Extreme weather events are becoming more intense and frequent.

Climate Change

- It is now generally acknowledged that the global climate is changing, as the earth becomes warmer. This change has the potential to affect human health in a number of ways, for instance by altering the geographic range and seasonality of certain infectious diseases, disturbing food-producing ecosystems, and increasing the frequency of extreme weather events, such as hurricanes.

What is the impact of climate change on health?

- Although global warming may bring some localized benefits, such as fewer winter deaths in temperate climates and increased food production in certain areas, the overall health effects of a changing climate are likely to be overwhelmingly negative. Climate change affects social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter.

Extreme heat

- Extreme high air temperatures contribute directly to deaths from cardiovascular and respiratory disease, particularly among elderly people. In the heat wave of summer 2003 in Europe for example, more than 70 000 excess deaths were recorded .
- High temperatures also raise the levels of ozone and other pollutants in the air that exacerbate cardiovascular and respiratory disease.
- Pollen and other aeroallergen levels are also higher in extreme heat. These can trigger asthma, which affects around 300 million people around the globe. Ongoing temperature increases are expected to increase this burden.

Natural disasters and variable rainfall patterns

- Globally, the number of reported weather-related natural disasters has more than tripled since the 1960s.
- Every year, these disasters result in over 60 000 deaths, mainly in developing countries.
- Rising sea levels and increasingly extreme weather events will destroy homes, medical facilities and other essential services.
- More than half of the world's population lives within 60 km of the sea. People may be forced to move, which in turn heightens the risk of a range of health effects, from mental disorders to communicable diseases.

Natural disasters and variable rainfall patterns

- Increasingly variable rainfall patterns are likely to affect the supply of fresh water. A lack of safe water can compromise hygiene and increase the risk of diarrhoeal disease, which kills approximately 760 000 children aged under 5, every year.
- In extreme cases, water scarcity leads to drought and famine. By the late 21st century, climate change is likely to increase the frequency and intensity of drought at regional and global scale .

Natural disasters and variable rainfall patterns

- Floods are also increasing in frequency and intensity. Floods contaminate freshwater supplies, heighten the risk of water-borne diseases, and create breeding grounds for disease-carrying insects such as mosquitoes. They also cause drownings and physical injuries, damage homes and disrupt the supply of medical and health services.

Natural disasters and variable rainfall patterns

- Rising temperatures is likely to decrease the production of staple foods in many of the poorest regions. This will increase the prevalence of malnutrition and undernutrition, which currently cause 3.1 million deaths every year.

Patterns of infection

- Climatic conditions strongly affect water-borne diseases and diseases transmitted through insects, snails or other cold blooded animals.
- Changes in climate are likely to lengthen the transmission seasons of important vector-borne diseases and to alter their geographic range. For example, climate change is projected to widen significantly the area of China where the snail-borne disease schistosomiasis occurs .

Patterns of infection

- Malaria is strongly influenced by climate. Transmitted by *Anopheles* mosquitoes, malaria kills almost 600 000 people every year – mainly African children under 5 years old. The *Aedes* mosquito vector of dengue is also highly sensitive to climate conditions, and studies suggest that climate change is likely to continue to increase exposure to dengue.

Measuring the health effects

- Measuring the health effects from climate change can only be very approximate. Nevertheless, a WHO assessment, taking into account only a subset of the possible health impacts, and assuming continued economic growth and health progress, concluded that climate change is expected to cause approximately 250 000 additional deaths per year between 2030 and 2050; 38 000 due to heat exposure in elderly people, 48 000 due to diarrhoea, 60 000 due to malaria, and 95 000 due to childhood undernutrition.

Who is at risk?

- All populations will be affected by climate change, but some are more vulnerable than others. People living in small islands and other coastal regions, megacities, and mountainous and polar regions are particularly vulnerable.
- Children – in particular, children living in poor countries – are among the most vulnerable to the resulting health risks and will be exposed longer to the health consequences. The health effects are also expected to be more severe for elderly people and people with pre-existing medical conditions.
- Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.

WHO response

- Many policies and individual choices have the potential to reduce greenhouse gas emissions and produce major health co-benefits. For example, cleaner energy systems, and promoting the safe use of public transportation and active movement – such as cycling or walking as alternatives to using private vehicles – could reduce carbon emissions, and cut the burden of household air pollution.

In 2015, the WHO Executive Board endorsed a new work plan on climate change and health. This includes:

- Partnerships: to coordinate with partner agencies within the UN system, and ensure that health is properly represented in the climate change agenda.
- Awareness raising: to provide and disseminate information on the threats that climate change presents to human health, and opportunities to promote health while cutting carbon emissions.
- Science and evidence: to coordinate reviews of the scientific evidence on the links between climate change and health, and develop a global research agenda.
- Support for implementation of the public health response to climate change: to assist countries to build capacity to reduce health vulnerability to climate change, and promote health while reducing carbon emissions.

Occupational health

- Occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards.
- The health of the workers has several determinants, including risk factors at the workplace leading to cancers, accidents, musculoskeletal diseases, respiratory diseases, hearing loss, circulatory diseases, stress related disorders and communicable diseases and others.
- Employment and working conditions embrace other important determinants, including, working hours, salary, workplace policies concerning maternity leave, health promotion and protection provisions, etc.

What is occupational health and safety?

- Occupational health and safety is a discipline with a broad scope involving many specialized fields. In its broadest sense, it should aim at:
- the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations;
- the prevention among workers of adverse effects on health caused by their working conditions;
- the protection of workers in their employment from risks resulting from factors adverse to health;
- the placing and maintenance of workers in an occupational environment adapted to physical and mental needs;
- the adaptation of work to humans.

Poor working conditions affect worker health and safety

- Poor working conditions of any type have the potential to affect a worker's health and safety.
- Unhealthy or unsafe working conditions are not limited to factories — they can be found anywhere, whether the workplace is indoors or outdoors. For many workers, such as agricultural workers or miners, the workplace is “outdoors” and can pose many health and safety hazards.
- Poor working conditions can also affect the environment workers live in, since the working and living environments are the same for many workers. This means that occupational hazards can have harmful effects on workers, their families, and other people in the community, as well as on the physical environment around the workplace.

Poor working conditions affect worker health and safety

- A classic example is the use of pesticides in agricultural work. Workers can be exposed to toxic chemicals in a number of ways when spraying pesticides: they can inhale the chemicals during and after spraying, the chemicals can be absorbed through the skin, and the workers can ingest the chemicals if they eat, drink, or smoke without first washing their hands, or if drinking water has become contaminated with the chemicals.
- The workers' families can also be exposed in a number of ways: they can inhale the pesticides which may linger in the air, they can drink contaminated water, or they can be exposed to residues which may be on the worker's clothes. Other people in the community can all be exposed in the same ways as well. When the chemicals get absorbed into the soil or leach into groundwater supplies, the adverse effects on the natural environment can be permanent.

occupational health

- Overall, efforts must aim to **prevent** industrial accidents and diseases, and at the same time recognize the connection between worker health and safety in the workplace, and the environment in the workplace.

Why is occupational health and safety important?

- Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, whether it is on a plantation, in an office, factory, etc. Therefore, work environments should be safe and healthy. Yet this is not the case for many workers. Every day workers all over the world are faced with a multitude of health hazards, such as:
 - dusts;
 - gases;
 - noise;
 - vibration;
 - extreme temperatures.

Why is occupational health and safety important?

- Unfortunately some employers assume little responsibility for the protection of workers' health and safety. In fact, some employers do not even know that they have the moral and often legal responsibility to protect workers. As a result of the hazards and a lack of attention given to health and safety, work-related accidents and diseases are common in all parts of the world.

For workers some of the **direct costs** of an injury or illness are:

- the pain and suffering of the injury or illness;
- the loss of income;
- the possible loss of a job;
- health-care costs.

For employers, some of the **direct costs** are:

- payment for work not performed;
- medical and compensation payments;
- reduction or a temporary halt in production;
- increased training expenses and administration costs;
- possible reduction in the quality of work;
- negative effect on morale in other workers.

Occupational Hazards

- Some occupational diseases have been recognized for many years, and affect workers in different ways depending on the nature of the hazard, the route of exposure, the dose, etc. Some well known occupational diseases include:
- asbestosis (caused by asbestos, which is common in insulation, automobile brake linings, etc.);
- silicosis (caused by silica, which is common in mining, sandblasting, etc.);

Occupational Hazards

- lead poisoning (caused by lead, which is common in battery plants, paint factories, etc.);
- and noise-induced hearing loss (caused by noise, which is common in many workplaces, including airports, and workplaces where noisy machines, such as presses or drills, etc. are used).

Health problems associated with poor working conditions

- There are also a number of potentially crippling health problems that can be associated with poor working conditions, including:
- heart disease;
- musculoskeletal disorders such as permanent back injuries or muscle disorders;
- allergies;
- reproductive problems;
- stress-related disorders.

Occupational health in Developing Countries

- Many developing countries report only a small number of workers affected by work-related diseases. These numbers look small for a variety of reasons that include:
- inadequate or non-existent reporting mechanisms;
- a lack of occupational health facilities;
- a lack of health care practitioners who are trained to recognize work-related diseases.

Asbestos

- Asbestos is a mineral that was widely used in industry until the 1970s
- In some occupations, asbestos fibers are released into the air and a worker can breathe them in
- Asbestos can cause parenchymal asbestosis, asbestos-related pleural abnormalities, lung cancer, and mesothelioma

What should be done in case of exposure to asbestos

- Stop exposure
- Contact a doctor to receive:
 - Chest X-ray
 - Pulmonary function tests
 - Annual flu shots and a pneumococcal vaccine
- Quit smoking

Health and safety programmes

- workplace hazards should be controlled - **at the source** whenever possible;
- records of any exposure must be maintained for many years;
- both workers and employers are informed about health and safety risks in the workplace;
- there is an active and effective health and safety committee that includes both workers and management;
- worker health and safety is a priority and the employer has a moral commitment and responsibility to insure that.