



AgriSafetyNet

## Agricultural Safety Through Lifelong Learning

2019-1-SK01-KA202-060645

# Module 4 BASIC ELEMENTS OF RISK PREVENTION MANAGEMENT



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## 1. Occupational Hazard Prevention Management

### 1.1. Occupational Hazard Prevention Management Systems

#### Occupational Hazard Prevention Policy

**Agricultural work**, the most prevalent type of employment in the world, has become a major concern focus because of its safety and health issues engendered by biological agents, chemical substances, ergonomic risk factors, noise, psychosocial risk factors, radiation, vibration, and work environment (Papkalla & Collison, 2017): foodborne illnesses, HIV/AIDS, injuries, livestock-related illnesses, musculoskeletal diseases, noise-induced hearing loss, pesticide exposure, reproduction issues, respiratory diseases, undernutrition, water-associated vector-borne diseases (Frank *et al.*, 2004; Hawkes & Ruel, 2006; Wolf *et al.*, 2018).

**Agriculture**, together with hotels & restaurants and construction, are the sectors most affected by long working hours (biceps tendonitis, clavicle fractures, frozen shoulder, glenohumeral joint osteoarthritis, impingement, rotator cuff tendinopathy/tear, shoulder bursitis, shoulder dislocation, shoulder fractures, shoulder separation) (Leka & Jain, 2010).

Land and/or soil in hazardous condition are those at high risk of contamination by hazardous substances (agricultural chemical agents, heavy metals, other industrial waste) (Zhang, 2003). But agricultural wastes also can be hazardous if they contain counterfeit and substandard chemicals or because of inadequate transportation, lack of coordination amongst concerned authorities, low enforcement of already outdated legislation, low levels of awareness and capacity, poor storage, porous border control, and scarce quality control (WHO, 2016, 2019a).

Environmental and agricultural drivers of infectious diseases of poverty (agricultural intensification, climate change, dams, lakes and irrigation systems, ecological disruption and contamination, and forestry changes) should also be taken into account (WHO, 2013).



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**Nanotechnology** (“the branch of technology that deals with dimensions and tolerances of less than 100 nanometres, especially the manipulation of individual atoms and molecules” - *Lexico*), which offers considerable opportunities for the development of innovative products and applications for agriculture, may also have a negative impact on human health (*FAO & WHO*, 2013).

The point is that the number of agriculture-related **noncommunicable diseases** (*WHO & UNO*, 2018; *Wolf et al.*, 2018) is huge: cancer (breast, cervical, colorectal, liver, lung, prostate, stomach), cardiovascular diseases (cerebrovascular disease, congenital heart disease, coronary artery disease, deep-vein thrombosis and pulmonary embolism, heart attack, peripheral artery disease, stroke), chronic respiratory diseases (asthma, chronic obstructive pulmonary disease, cystic fibrosis, occupational lung diseases such as black lung, pulmonary hypertension), and diabetes (1 and 2).



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**Unintentional poisonings** kill an estimated 355,000 people globally each year. In developing countries (where two thirds of these deaths occur) such poisonings are associated strongly with **excessive exposure to, and inappropriate use of, toxic chemicals**. In many such settings, toxic chemicals may be emitted directly into soil, air, and water - from industrial processes, pulp and paper plants, tanning operations, mining, and **unsustainable forms of agriculture** - at levels or rates well in excess of those tolerable to human health. (World Health Organisation)

In order to address identified and assessed hazards, including ergonomics-related hazards (**ergonomics** is “the study of people's efficiency in their working environment” - *Lexico*), a farmer should take **preventive measures** to deal with:

- A newly identified hazard in a speedy and efficient manner;
- Ergonomics-related hazards that are identified when planning implementation of change to the work environment or to equipment, practices, processes, or work duties.



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**Preventive measures** are all useful, practical and effective methods that make it possible to avoid the occurrence of a hazardous situation by controlling current working conditions, existing activities, or present hazards. For example, when handling **pesticides**, farmers should pay attention to such aspects as application / spraying, classification / labelling, disposal, exposure, first-aid, health problems, loading mixing, personal protective equipment, post-application, spilling, and transport (Fait *et al.*, 2001; WHO & FAO, 2019).

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Are **preventive measures** the following (*Hazard Prevention Program Guide*, 2014; *OSHA*, 2016):

- The **physical elimination/removal of the hazard**: the machine, thing, condition or activity that constitutes the hazard is replaced by another machine, thing, condition or activity that eliminates the original hazard, and which does not create a new hazard; for example, detoxifying agriculture from highly hazardous pesticides is possible by applying Integrated Pest Management, i.e. the careful consideration of all available pest control techniques and subsequent integration of appropriate measures that discourage the development of pest populations and keep pesticides and other interventions to levels that are economically justified and reduce or minimize risks to human health and the environment through the use of good agricultural practices, low-risk chemical pesticides, microorganisms (bacteria, fungi, viruses), natural enemies of pests (plants and animals), pest monitoring, semiochemicals (chemical substances or mixtures released by an organism that affect the behaviours of other individuals), and sustainable farming systems (*FAO & WHO*, 2019); the lists of hazardous pesticides have been continuously updated (Montreal Protocol, 1989; Stockholm Convention, 2004; and Rotterdam Convention, 2004 - cf. *WHO*, 2019b);
- The **replacement/substitution of the hazard**: if the farmer cannot eliminate the hazard, he/she can attempt to reduce it through control techniques that aim to diminish the intensity of the hazard should it occur, prevent the hazardous situation from occurring, or eliminate hazardous tasks; for example, buying quiet equipment and tools;
- The **reduction of the hazard**, including isolating it: for example, controlling the noise hazard;
- The **change of the way people work**: for example, setting time limits;



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- The **provision of Personal Protective Equipment (PPE)**: if the farmer cannot reduce hazard, he/she should protect himself to counter a hazardous occurrence or diminish the scope of potential damage. There are two types of protection - group and personal:
  - **Group protection** involves blocking or separating the hazard from the employee: for example, sending the noise-making equipment to the mechanic for repair;
  - **Personal protection** involves providing employees with protective equipment or clothing such as dust mask, earplugs, eyewear (safety glasses, safety goggles), face shield, high visibility apparel/clothing (head ware, gloves, jackets, pants, rainwear, shirts, sweatshirts), protective boots, protective helmet, safety gloves, women's clothing.



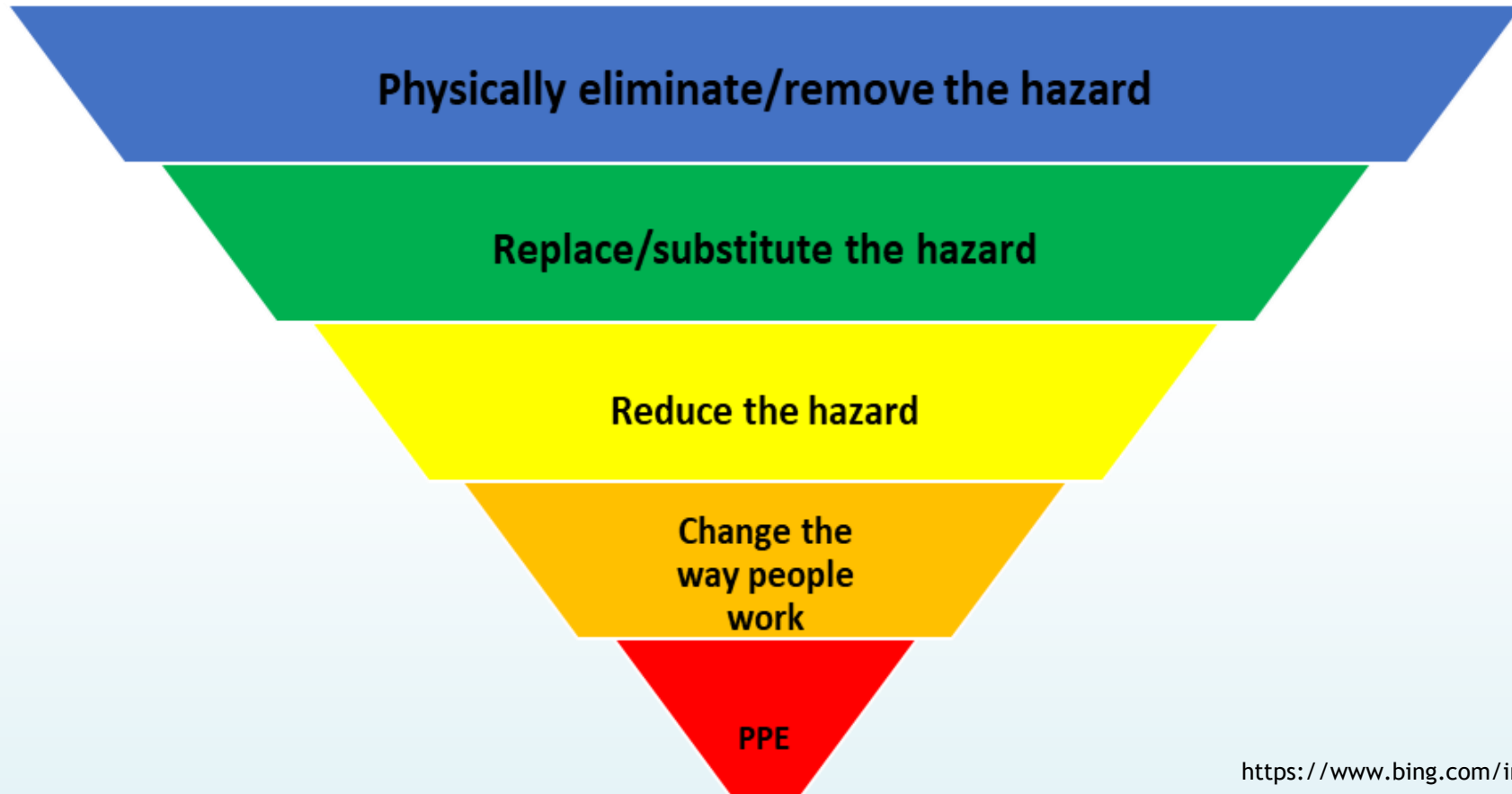
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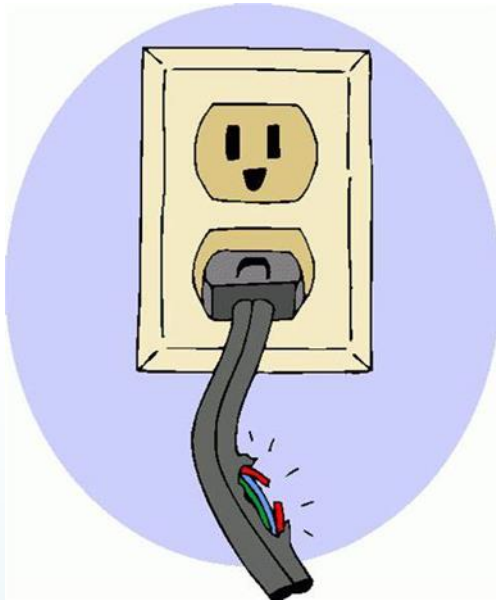
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In order to avoid failures that could result in a hazard to employees, the farmer shall develop and implement a set of **management techniques** that aim to reduce the hazard) as part of the **preventive measures** (*Hazard Prevention Program Guide*, 2014; *OSHA*, 2016):

- **Hazard-free preventive measures:** since a preventive measure controls a current working condition, an existing activity, or a present hazard, the farmer should make sure that the measure itself is not a source of a hazard before implementing it: for example, if he/she installs a conveyor belt to replace a lift truck, he/she should make sure it is in compliance with current safety standards. If a new hazard arises, it must be dealt with as soon as possible: for example, when indicating areas for pedestrian traffic, the farmer should make sure it does not cause an unsafe congestion of lift trucks in another location, install mirrors so that the operator can see pedestrians before turning a blind corner, etc.



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**Preventive maintenance program:** such a program consists in establishing a list of the equipment, machinery, structures, and tools that need to be inspected, adjusted, cleaned, lubricated, replaced, etc.; drawing up a maintenance schedule; describing the maintenance procedures; recording the work completed; verifying the progress of work; and assessing effectiveness. It is mandatory because its purpose is to prevent failure in the long term of equipment, machinery, structures, and tools through routine inspections and the repair of worn parts: for example, mechanical maintenance, planned inspections, and the replacement of worn brakes on a tractor are indispensable prevention measures.



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**Record preventive measures:** keeping a record of implemented preventive measures is important to the success of the hazard prevention program. The farmer needs this record to complete the subsequent steps in the prevention process.



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**Hazard-free  
preventive  
measures**

**The farmer should make sure that the measure itself is not a source of a hazard before implementing it.**

**Preventive  
maintenance  
program**

**The farmer should establish a list of the equipment, machinery, structures, and tools that need to be inspected, adjusted, cleaned, lubricated, replaced, etc.**

**Record  
preventive  
measures**

**The farmer should keep a record of implemented preventive measures is important to the success of the hazard prevention program.**



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## Hazard Evaluation

In order to assess/evaluate hazards on his farm, the farmer should develop a **hazard identification** (to highlight the operations of critical tasks - tasks posing significant risks to the health and safety of employees - and the hazards pertaining to certain equipment because of activities performed, energy sources, and working conditions) and **assessment methodology**, including one for **ergonomics-related hazards**, taking into account the following documents and information:

- Any employee reports on hazards;
- Any government or farmer reports, studies and tests concerning the health and safety of employees;
- Any hazardous occurrence investigation reports;
- Any reports made under the Safety and Health Committees and Representatives Regulations;
- Any results of work place inspections;
- First aid records and minor injury records;
- The record of hazardous substances;
- Work place health protection programs;
- Any other relevant information, including ergonomics-related information.



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The **hazard identification and assessment methodology** should include:

- The steps and time frame for identifying and assessing the hazards;
- The keeping of a record of the hazards;
- A time frame for reviewing and, if necessary, revising the methodology.

The farmer can identify hazards by observing tasks that are actually performed at the various work stations for each of these **hazard identification techniques**: accident and incident investigations, failure analysis, potential accident factors, preliminary investigations, task safety analysis, and work place inspections.

It is important to identify hazards in due time because farm accidents affect not only a worker, but his/her entire environment (El Batawi, 2004).



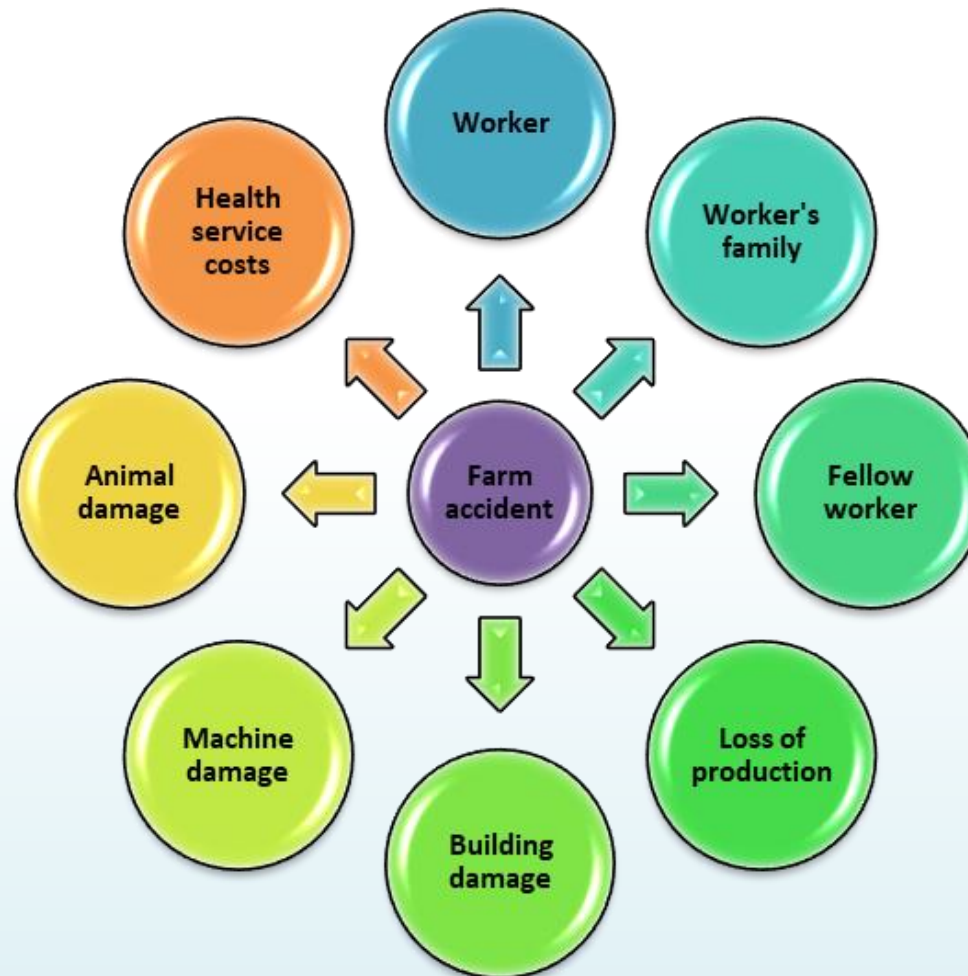
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The identification method may vary depending on the **size of the work place**:

- On a **small farm**, it may be to the farmer's benefit to identify hazards **per individual**, as each individual performs specific tasks: for example, one employee is a tractor driver, while another one is a tractor driver who also takes care of the mechanical maintenance of tractors;
- On a **larger farm**, it is more likely that several employees hold the same positions: for example, body workers, mechanics, tractor drivers, etc. Therefore, it may be to the farmer's benefit to identify hazards **per work station**;
- On a **still larger farm**, it may be to the farmer's benefit to identify hazards **by work area**, grouping individuals and work stations by similarity of tasks, hazards and management - for example, on a mix farm, animal raising, crop growing, equipment maintenance, etc. - where hazards should be identified for all animal raisers (for example, avian influenza - cf. *WHO*, 2006), for all crop growers, for all maintenance technicians, etc.
- On **very large farms**, it may be to the farmer's benefit to identify hazards **by divided areas or by facility**, where each foreman is responsible for both production and his/her prevention program.

After having identified the hazards, the farmer should establish and maintain an **identification record** in print or electronic format.

The **identification technique** consists in identifying five components of work:

- Equipment (machines and tools);
- Materials (substances and products);
- Environment;
- Personnel;
- Work organization.





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The interaction among these five components may be, when transporting fresh vegetables to the green market, for example:

- **Normal**, when the fresh vegetables are delivered to the green market retailers with a truck, etc.;
- **Abnormal**, when incidents such as an accident, a fire, or an occupational disease occur, and the fresh vegetables do not reach the green market.

To identify the hazards involved in driving a truck, for example, the farmer should:

- Identify the work components (of the truck, for example);
- Ask what may go wrong (back injury, collision, falling material, flammable material, possible breakdown of a truck part).



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The farmer should define the **steps for the identification of hazards** and a **time frame for hazard identification** by including the following information:

- Who is responsible for the identification: for example, an individual or individuals appointed by the health and safety committee, the work place health and safety committee, etc.;
- How the identification reports are processed: for example, compilation and processing by the committee, by individuals appointed by the committee, etc.;
- What the time frame is: for example, the identification of hazards for animal raisers must be completed in December, for crop growers in April, and for mechanics in November;
- What the date for the review of the identification is: for example, every two years.

Emphasis should be placed on identification, because follow-up of the prevention program depends upon it: assessment of hazards, employee education, and implementation of preventive measures.



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The farmer should identify and assess the **hazards in the work place**, including ergonomics-related hazards, in accordance with the methodology presented above, taking into account the following:

- Any employee reports on hazards;
- The effects (real or apprehended) of the exposure on the health and safety of employees;
- The employees' level of exposure to the hazard;
- The frequency and duration of employees' exposure to the hazard;
- The preventive measures in place to address the hazard;
- The nature of the hazard and, in the case of ergonomics-related hazards, all ergonomics-related factors such as:
  - The circumstances in which the work activities are performed, the organization of the work, physical demands of the work activities, the work environment, and the work procedures;
  - The characteristics of animals, equipment, goods, materials, persons, things, tools, and work spaces;
- Any other relevant information.



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It is very likely that the hazards encountered on a farm during the identification step are numerous, which makes any single action to control all of them impossible. Therefore, the farmer should critically examine all of the hazards in order to establish an order of priority to be able to prioritize his/her preventive measures, without losing sight of the final objective - eliminating all hazards in the work place or, if they cannot be eliminated, controlling them.

The farmer can consult the employee reports, the first aid record, the hazardous occurrence reports, the minor injuries record, and his/her workers' compensation statements, which can enable him/her to assess the level of hazard exposure to employees.

The farmer can use any other assessment method, provided it takes into account all the factors mentioned above (under **hazards in the work place**).



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## Preventive Planning Activity

To implement his/her hazard preventing plan, the farmer should:

- Develop an implementation plan specifying the time frame for each phase of the development and implementation of the prevention program;
- Monitor the progress of the implementation of the preventive measures;
- Review the time frame of the implementation plan regularly and, if necessary, revise it.



In **implementing the prevention program**, the farmer should ensure that:

- Ergonomics-related hazards are **identified**;
- Ergonomics-related hazards are **assessed**;
- Ergonomics-related hazards are **eliminated** or **reduced** as much as is reasonably possible;
- People assigned to identify and assess ergonomics-related hazards have the **necessary instruction and training**.

There are two **ways of monitoring the implementation of a prevention program**:

- To verify whether the scheduled activities took place as planned, step by step, by:
  - Describing the measure to be implemented and the work to be performed (new work conditions, new tasks, new technical activities, new work, etc.);
  - Approving the work to be performed;
  - Document new work procedures;
  - Provide employee training;
- To verify whether the preventive measures were implemented as planned: if, for any reason, implementation of a scheduled measure of the prevention program was delayed, the farmer should revise the work schedule immediately because other work planned to follow may have to be shifted.

**Ergonomics-related hazards are identified**



**Ergonomics-related hazards are assessed**



**Ergonomics-related hazards are eliminated or reduced**



**People have the necessary instruction and training**



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## 2. International Institutions and Organizations

### 2.1. Inter-governmental Organisations

**Inter-governmental Organisations** cooperating in **occupational health** are either **international** or **regional** and **sub-regional**.

Are **international inter-governmental organisations** involved in **occupational health** the following:

- The **World Health Organisation (WHO)**, a specialized agency of the United Nations, whose mandate is to advocate for universal healthcare, coordinate responses to health emergencies, monitor public health risks, and promoting human health and well-being. It was established on 7 April 1948, and is headquartered in Geneva, Switzerland.
- The **International Labour Organization (ILO)**, a United Nations agency whose mandate is to advance social and economic justice through setting international labour standards. It was established on 29 October 1919, and is headquartered in Geneva, Switzerland.



WHO



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- The **African Union (OAU)**, a continental organisation whose mandate is to encourage political and economic growth among member states, and to eradicate colonialism and neo-colonialism from the African continent. It was established on 9 July 2002, and is headquartered in Addis Ababa, Ethiopia.
- The **Organization for Economic Cooperation and Development (OECD)**, an economic organization whose mandate is to stimulate economic progress and world trade. It was established on 16 April 1948, and is headquartered in Paris, France.
- The **Organization of American States (OAS)**, a continental organization whose mandate is to enhance solidarity and cooperation among its member states within the Western Hemisphere. It was established on 30 April 1948, and is headquartered in Washington, DC, USA.



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Are **regional and sub-regional inter-governmental organisations** involved in **occupational health** the following:

- The **European Free Trade Association (EFTA)**, a regional trade organisation and free trade area consisting of four European states (Iceland, Liechtenstein, Norway, and Switzerland), whose mandate is to serve as an alternative trade bloc for those European states that were unable or unwilling to join the then European Economic Community (EEC), which subsequently became the European Union. It was established on 4 January 1960, and is headquartered in Geneva, Switzerland.
- The **European Union** (formerly the European Coal and Steel Community and the European Economic Community), a political and economic union of 27 member states that are located primarily in Europe, whose mandate is to respect the rule of law and human rights. It was established on 1 November 1993, and is headquartered in Brussels, Belgium.



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- The **Caribbean Community (CARICOM)**, an organisation of fifteen nations and dependencies throughout the Americas, whose mandate is to promote economic integration and cooperation among its members whose mandate is to ensure that the benefits of integration are equitably shared, and to coordinate foreign policy. It was established on 4 July 1973, and is headquartered in Georgetown, Guyana.
- The **North American Free Trade Agreement (NAFTA)**, an agreement signed by Canada, the United Mexican States, and the United States of America, whose mandate is to promote trade among the members of this trade bloc. It was established on 1 January 1994, and is headquartered in Ottawa, Canada, Mexico City, Mexico, and Washington, DC, USA.
- The **Southern Common Market**, a South American trade bloc, whose mandate is to promote free trade and the fluid movement of goods, people, and currency. It was established on 26 March 1991, and is headquartered in Montevideo, Uruguay.



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## 2.2. International Non-governmental Organisations

Are **international non-governmental organisations** the following:

- The **International Commission on Occupational Health (ICOH)**, is an international professional society whose mandate is to foster the scientific development, knowledge, progress of occupational health and safety in all its aspects. Eight of its 39 scientific committees deal with occupational-related issues (Occupational and Environmental Dermatoses, Occupational Health and Development, Occupational Health for Health Workers, Occupational Health in the Chemical Industry, Occupational Health in the Construction Industry, Occupational Health Nursing, Occupational Medicine, and Occupational Toxicology). It was established on 31 October 1906, and is headquartered in Rome, Italy.
- The **International Social Security Association (ISSA)**, an organization bringing together national social security administrations and agencies, whose mandate is to cooperate in the promotion and development of social security throughout the world in order to advance the social and economic conditions of the population on the basis of social justice. It was established on 4 October 1927, and is headquartered in Geneva, Switzerland.



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- The **International Organization for Standardization (ISO)**, a standard-setting body composed of representatives from various national standard organisations, whose mandate is to promote worldwide commercial, industrial, and proprietary standards. It was established on 23 February 1947, and is headquartered in Geneva, Switzerland.



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Standardiza

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# PROJECT CONSORTIUM



Defoin



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