

**Dedicated to**

**all people in my homeland, Iran, who fight for freedom and equality  
with the slogan of  
WOMAN  
LIFE  
FREEDOM**

**MY FAMILY  
who never stopped supporting me even from 6000 km away and  
believed in my abilities**

**Occupational injuries in fishing, farming and forestry in southeast  
Asia, Australia, and selected European  
coastal countries**

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This thesis is submitted in fulfilment of the requirements for the degree of Master  
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## **Abstract**

### **Introduction**

According to International Labour Organization (ILO) estimates, about 2.3 million men and women worldwide die from work-related illnesses or accidents each year. The category of fishing, farming and forestry industry is among the riskiest and most hazardous occupations. Agriculture employs more than one billion workers, about 17 million people are engaged in fishing, and more than 13 million people work in forestry worldwide. These workers suffer from a wide range of injuries. can be found not wearing compulsory safety equipment and ignoring safety rules. More knowledge about these occupations might be useful for future preventive actions to reduce the injury numbers.

### **Aims**

This study will use data from ILO to provide an overview to national statistics on fatal and non-fatal occupational injuries in farming, fishing, and forestry occupations in southeast Asia (Malaysia and Philippines), Australia and selected European coastal countries (France, Spain, United Kingdom, and Norway). The specific aims of this study were to:

Describe national statistics from ILO concerning occupational injuries (fatal and non-fatal) in fishing, farming and forestry occupations in low- and middle-income countries (LMIC) and compare these with statistics from high-income countries, and to discuss the results as well as their usefulness for designing preventive measures to reduce the number of injuries in fishing, farming, and forestry.

### **Methods**

The data of this descriptive study was obtained from ILOSTAT database in September 2022. The following data for the period 2010 -2015 were obtained:

- Number of cases of fatal occupational injuries per 100 000 workers by economic activity
- Number of cases of non-fatal occupational injuries per 100 000 workers by economic activity

For both, aggregated total data for agriculture, forestry, and fishing were analyzed, except in the case of Malaysia, which only had data for fishing.

The data found in the ILOSTAT database were compiled into Excel sheets and analyzed by using descriptive statistics. In addition, the data were transferred to the statistical package IBM SPSS Statistics version 28.0.1.0, and a few trend analyses were performed.

## **Results/Discussion**

Among the selected countries of this study, France had the highest rate of non-fatal injuries (16 249.2/100 000 by the year 2011) and the second highest rate was found in-Norway (85.5/100 000 by the year 2014). Europe had, in general, reported higher rates of both fatal and non-fatal injuries compared to LMIC countries. The average number of non-fatal injuries in 2011 was higher than the other years and the average number of fatal injuries was highest in 2014. As a result of the wide variations in the figures in the selected time span, it was not possible to deduce an overall trend for injury occurrence for all countries, but there was an increasing trend for non-fatal injuries in both United Kingdom and Spain in the time period 2010-2015. It is possible that the increasing trend in the numbers of injuries is due to better reporting and not worsening working conditions. ILO data were incomplete for both some years and some countries, and it is likely that there was underreporting. Underreporting is very likely to occur in developing countries (LMIC). Even in the most developed nations, underreporting is probably occurring. Therefore, due to insufficient amount of data in this study, the results and interpretation may not be reliable. A good reporting system ought to be established in all countries. How the reporting is performed might be a topic for future studies, including discussions about improving the reporting systems. The more complete the data, the better they can contribute to designing effective preventive measures. Since the data in this study is not sufficient, it is not possible to use it for preventive measures.

## **Conclusion**

The study found that there are wide variations in the numbers of both fatal and non-fatal occupational injuries rate in the-selected countries (southeast Asia (Malaysia and Philippines), Australia and selected European coastal countries (France, Spain, United Kingdom, and Norway)). Several high-income countries had higher averages of fatal and non-fatal injuries compared to LMIC countries. The need for improving injury reporting is discussed. The Thesis discusses the need for improving injury reporting Unfortunately, the ILO data were not

informative enough to be to be able to derive conclusions about possible preventive issues in the selected countries.

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## **Acronyms and Abbreviations**

**FAO**-Food and Agriculture Organization of the United Nations

**ILO**-International Labour Organization

**ILOSTAT**-International Labour Organization Statistics

**LIC**-Low-income countries

**LMIC**-Low- and middle-income countries

**OI**-Occupational injury

**OSHA**-Occupational Safety and Health Administration

**PPE**-Personal Protective Equipment

**SPSS**-Statistical Package for Social Sciences

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## Chapter 1. Introduction

The work categories of fishing, farming and forestry have long been among the riskiest and most hazardous occupations in the world. This thesis was undertaken to study data about occupational injuries in these occupations, and to see if the injury figures have been reduced over time, especially in low-income countries.

### 1.1 Occupational injuries

#### Global burden of occupational injuries

According to data from the International Labour Organization (ILO), 380 000 fatal occupational injuries occur each year worldwide. Only 10 760 of these deaths occur in the higher income countries. Most occur in lower- and middle-income countries (LMIC): 250 000 deaths in Asia and the 65 000 in Africa.[1] However, the rates of occupational injuries vary greatly between and within areas, with the highest rates occurring in the most dangerous industries and professions in developing nations. The average annual difference between nations ranges from 0.5 to 27.5 per 100 000 people.[1] The annual range between the safest and most dangerous employments varies between 0 and 500 deaths/100 000, with tropical logging jobs being the most dangerous.[1]

Table 1 lists the number of fatal and non-fatal occupational accidents in each of the five geographical areas. Out of the 5 regions in the world, Asia had the most deaths in numbers, accounting for more than 70% of fatal injuries worldwide. However, the fatal occupational rate in Asia was 12.99 per 100 000 workers, which was lower than the fatal occupational rate in Africa, which was 17.39 per 100 000 workers. With a rate of 3.02, Europe had the lowest fatality rate out of the five areas.[2]

**Table 1:** Breakdown of 2014 occupational accidents by Geographical Regions [2]

Region	Number of fatal accidents	Number of non-fatal injuries	Fatality rate*
Africa	71 882	25 434	17.39
America	24 579	966 221	5.12
Asia	271 949	121 256	12.99
Europe	11 017	1 921 644	3.02
Oceania	1 074	98 980	5.51
<b>Total</b>	<b>380 500</b>	<b>3 133 535</b>	<b>11.29</b>

\*Number of occupational accidents per 100 000 persons in the labour force

## **Definition of occupational injury**

The definitions of occupational injuries vary between different countries. The reason for this difference in definitions is that occupational injuries often are connected to compensation issues. A worker who experiences a serious injury at work, has the possibility of receiving an economic compensation. This compensation may help out if, for instance, the injury requires costly treatment or makes the worker unfit for further work. Different national social health systems provide different amounts of compensation, and the rules and regulations as well as the definitions are not the same in different countries.

The most common definition of an occupational injury is the one given from ILO:

“An occupational injury is defined as any personal injury, disease or death resulting from an occupational accident. An occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity.” [3]

An occupational accident is an unanticipated and unplanned event, including acts of violence, that occurs at work and causes one or more workers to suffer personal harm, disease, or death. A case of occupational injury occurs when a single worker sustains an injury as a result of a single occupational accident. An occupational injury can be fatal (occurring as a result of work-related accidents and resulting in death within one year of the accident) or non-fatal (resulting in missed work time). [3]

Occupational injuries and occupational diseases are totally different. Occupational illnesses, often known as occupational diseases, are not always related to severe or urgent workplace accidents. They are ailments that develop after working with a hazardous substance, poisonous chemicals, or products for an extended period of time. [4]

## **1.2 Study occupations**

This study initially aimed to focus specifically on the fishing industry worldwide, as fishing is a type of work which is of importance for many low-income countries. However, during planning and familiarizing with the database from ILO (ILOSTAT database) it was discovered that very few countries have separate injury data from fishing. Most countries with fishermen had aggregated their data in ILOSTAT to include injuries for fishing, farming and forestry as one figure, summarizing injuries from all these three occupational groups.

As international figures were sought, and ILO has the only international database including such statistics, it was decided to expand the study to include fishing, farming and forestry.

### **1.2.1 Occupational injuries in fishing**

Fishing is a well-known activity, and it carries a danger of occupational diseases and accidents, as well as other workplace hazards and safety concerns.[5] Also more than 17 million people are engaged in this industry.[6] Fishermen may be subject to catastrophic injuries and occupational risks, which can have a substantial influence on their health, depending on the type of operation. The fishing industry has one of the highest mortality rates in the workplace, according to the International Labor Organization (ILO), this is due to the danger of the work but also to its vulnerability; in most situations, when a serious injury happens at sea, there is no emergency care.[5]

Fishing is believed to be one of the most dangerous industries globally, with over 120 million accidents and 200 000 fatalities [5], due to the multiple hazards and health risks recorded from this ancient occupation. Countries that account for fisheries-related accidents have rates of more than 100 fatalities per 100,000 active fishermen in affluent countries.[5] Several laws relating to vessel safety and workplace safety have been implemented in this sector in recent years. Despite recent improvements, sea fishing seems to remain one of the most dangerous and difficult vocations.[5] Asia is responsible for about half of the world's annual fish yield. North and South America account for about (30%), followed by Europe (15%). Africa and Oceania are relatively unimportant fishing continents, producing only around 5% of the annual global catch.[7]

These statistics include people working in a variety of fishing sub-sectors, whether part-time or full-time, and at various scales. [8] Recognizing the importance of fishermen and workers in the fishing industry, Southeast Asian governments have begun to address significant concerns about the need to combat IUU (illegal, unreported, and unregulated) fishing and labor-related issues, as well as the status of persons involved in fishing and related activities in the region [8]. The growing demand for workers in the fisheries sector to support the expansion of intra-regional and international trade among Southeast Asian countries results in large numbers of migrant workers boarding ships to seek work in other countries, as well as large groups of workers moving from one country to another.

Hosting countries should pay close attention to the issues and concerns surrounding fisheries labor, particularly to allegations that these workers are paid poorly, have no or insufficient social security, are unskilled in relation to fishing operations, have received insufficient training prior to working onboard fishing vessels, and that in addition, they are often unaware of the requirements for safety at sea, have fake or no legal documents, and are subjected to forced labor.[8]

### 1.2.2 Risks and hazards in fishing

Drowning, gear-related accidents, and slips and falls are the three most frequent work injuries in fishing. Fishing is a wet activity. Falls are often unavoidable when wet feet come into contact with a wet surface, and slippage can result in a variety of injuries. Injuries from fishhooks and injury from boat propellers are the two incidents involving gear that happen the most frequently. [9] When casting with a hook on your line, not paying attention might result in hooks getting lodged in fellow workers. This may result in injuries to the ears, lips, eyes, or even muscles. Another example includes unintentional injuries, such as putting one’s hand in the path of a moving piece of equipment, such as the boat's whirling propeller. Such accidents can easily happen if workers are not very familiar with the work environment. Fishermen must pay close attention to safety issues in every aspect of the fishing process to avoid accidents. [9] It is possible for even seasoned fishermen to drown. The most frequent reasons for drowning are falling and going unconscious before getting into the water, tipping a canoe or kayak, and being dragged from the boat by a big fish on the line. [9]

**Table2:** lists of risk factors for occupational injuries in fishing (developed from [9])

Risk factors		Example/Explanation
1	Drowning	Leading cause of the death in the sector globally
2	Safety equipment	Unavailability of life saving equipment like life jackets
3	Not well-trained skippers and personnel	Appropriate equipment, training, experience, and information can prevent it
4	Poor on-board work organization	Due to vast variety of factors influencing work organization, on-board work organization is a tough subject to investigate
5	Wet and slippery conditions of deck	Due to the constant unstable motion of the boat, slips and trips are a persistent hazard in fishing

6	Falls	Can lead to more severe injuries and can occur due to slick waste-covered open decks and open holds
7	Physical issues	It is a physical demanding work and can lead to musculoskeletal injuries
8	Cuts and wounds	knife cuts, hook injuries and crushed fingers
9	Fish dragged on board while still alive	Can cause injuries from a sudden flip of the tail, a stab from the beak, bites to limbs or fingers etc.
10	Equipment and machinery	Steel wire ropes, winches, hoists, cables, fishing gear etc. PPE's can help to prevent such accidents.
11	Fittings that protrude from the deck	Eyebolts, bollards, capstans, and other fittings that protrude from the deck can cause injury
12	Electrical safety	Contact with an electric current can cause tingling, contact burns, muscular control loss, shock, and death
13	Lighting and visibility	Internal lighting on vessels, which is necessary for fishing work in handling, is frequently insufficient
14	Noise	Exposure to loud noise from the engine room, may reduce the possibility of hearing warning shouts
15	Chemical hazards	Exposure to chemicals, for instance chlorine can cause acute intoxications
16	Confined spaces and asphyxiation	People can die from a lack of oxygen or poisoning from hazardous gases such as hydrogen sulfide fumes
17	Long working hours	Lack of sleep and fatigue can prohibit workers from doing their duties safely and correctly

### 1.3 Occupational injuries in farming(agriculture)

Agriculture employs more than a third of the worldwide work force, making it the world's second largest employer after services. In many nations, particularly those located in Africa and Asia, agriculture is also the most significant sector for female employment, and a sizable portion of agricultural workers are women. Agriculture employs a vast range of machinery, animals, plants, and goods, and humans labor in both indoor and outdoor locations under a variety of geographical and climatic conditions. [10] While large-scale, heavily mechanized agricultural enterprises dominate in many wealthy nations, labor-intensive farming is much more prevalent in many underdeveloped nations.

Such diverse characteristics, both in terms of employment and business, have a significant impact on the industry's risk awareness levels and attitudes toward disease and accident prevention. Agriculture is one of the most dangerous industries, and each year, a large number of agricultural employees have occupational illnesses and accidents. [10]

Agriculture accounts also for around 70% of child labor globally, making it the most pervasive economic sector for child labor. Furthermore, because so many young people under the age of employment reside on farms, there is a much higher risk of accidents and illnesses for them, including exposure to pesticides and other chemicals commonly used in agriculture. [10]

### 1.3.1 Risk and hazards in farming

Agriculture is one of the most dangerous industries, and each year, many agricultural employees experience occupational accidents. There are various contributing factors to this problem, and the hazards have increased over the years due to the extensive use of machines, pesticides, and other agrochemicals. The frequency and fatality rates of injuries are higher when machinery is involved, such as tractors and harvesters. Pesticide and other agrochemical exposure is a significant occupational danger in this industry. This can cause poisoning, death, and, in some cases, cancer and reproductive problems. [10]

**Table 3:** Lists of occupational risks and hazards for injuries in farming (developed from US Department of Labor (OSHA)) [11]

Risk factor		Example/Explanation
1	Animal-Acquired infections	Agricultural workers could come into contact with animals that harm them, for example dangerous, kicking cattle
2	Grain bins and silos	They present numerous risks. When handling grain bins and silos, farmworkers run the risk of suffocation or engulfment, as well as grain dust exposure and explosions.
3	Hazardous equipment and machinery	Farmworkers frequently work on ladders, operate machinery in their shops, and use cutting tools like knives and hoes. However, when used or maintained incorrectly, these straightforward instruments can be dangerous and have the potential to result in serious injury.
4	Heat	Workers who are exposed to hot, humid weather are at a significant risk of developing heat illness, especially if they are performing strenuous labor or wearing bulky safety gear.
5	Musculoskeletal injuries	Agricultural workers for instance handle heavy loads, which can lead to musculoskeletal ailments.
6	Noise	Due to excessive industrial noise, thousands of workers experience preventable hearing loss each year. Noise and reduced hearing may both inhibit hearing warning shouts and increase risk of accidents



7	Pesticides and other chemicals	Farmworkers and their families are at risk of acute intoxications. Toxic pesticides can be ingested by workers who mix, load, or apply pesticides owing to spills and splashes, faulty, missing, or insufficient protective equipment, direct spray, or drift.
8	Vehicle hazards	The inappropriate use of steer skidders, improper tractor hitching, carbon monoxide poisoning, and clothing and hair entrapment in poorly guarded moving parts are also risks.

**1.4 Occupational injuries in forestry**

The forestry industry is among the industries with the highest injury risk in many national economies. Despite the development of new technologies, the production of forests is still regarded as one of the most hazardous jobs due to the high death rate and frequent accidents. [12] Workers are exposed to significant physical, psychological, and environmental influences that result in various type of injuries, as a result of, for instance, the natural environment, heavy loads, and frequent use of hand tools and machines.[12] Forestry salaries are typically far lower than the industry average. Often, employees, both the self-employed, and contractors attempt to make up for this by putting in 50 or even 60 hours per week. Fatigue puts more stress on the body and raises the likelihood of accidents.[13]

Forestry is typically described as 3D work; that is degrading, dirty, and dangerous. Forestry necessitates challenging and uncomfortable working positions as well as exposure to noise and vibration. [12]

The most dangerous job in forestry is tree felling, and in developing nations, approximately half of all forestry accidents involve chainsaws. In recent years, significant advancements in chainsaw safety have been made. To investigate, report, and analyze chainsaw incidents, however, extra attention should be given due to the prevalence of chainsaws in the forest industry and their propensity to result in harm and fatalities. [12]

Accident rates are still high because forest workers frequently fail to follow safety regulations and do not wear the required safety gear. Similarly, despite being advised to do so in order to prevent catastrophic and deadly accidents, the majority of forest workers do not wear personal protective equipment. [12]

### 1.4.1 Risks and hazards in forestry

Contractors, farmers, and self-employed people appear to be particularly vulnerable. The self-employed and farmers might only utilize forestry instruments for a portion of their work, in which case they might lack experience and competence, whereas forestry contractors must complete their work in limited periods of time while regularly changing their workplace. A contributing reason for the higher levels of accident rates could be a breakdown in organization between the contractor and the host employer. [12],[14]

**Table 4:** Lists of occupational risks and hazards for injuries in forestry (developed from Food and Agriculture Organization (FAO) [15])

Risk factor		Example/Explanation
1	Extreme heat and cold	High temperatures can cause acute heat stress and dehydration. Extreme cold can also cause injuries. Both may be lethal.
2	Tree hang-ups, falling branches and trees, and chainsaw "kickbacks"	Physical hazards from the cutting of trees may cause serious accidents.
3	Terrain and site factors	Forestry operations frequently take place on steep slopes, where there is a greater risk of machinery mishaps and rock falls. When wet, finely textured soils (such clays) become slick and increase the chance of heavy machinery accidents.
4	Noise	If hearing protection is not utilized, noise from chainsaws and brush cutters can result in hearing loss. Noise and reduced hearing may both inhibit hearing warning shouts and increase the risk of accidents.
5	Wood loading and unloading	In forestry, loading and unloading wood is a risky task. Another risky task that can be made safer by following best practices is the transportation of wood over curvy roads, possibly in bad weather.
6	Chemical and biological hazards	The forest industry presents a variety of biological and chemical risks, including the possibility of exposure to plant, pollen, and insect bite allergies, as well as fumes from chainsaw use and pesticides.

## 1.5 Injury reporting

### 1.5.1 Risk assessment

A key methodology for identifying where and how hazardous work is carried out, who is at risk, and what safety and health solutions can be put in place, is a workplace safety and health risk assessment. This should be undertaken by the employer in collaboration with the workers.[16] Risk assessment is a participative method that enables employers and employees to identify and address safety and health issues, as well as to come up with realistic solutions. The goal is to

prevent and reduce workplace fatalities, injuries, and illnesses. Risk assessment is becoming a more important issue for purchasers in deciding market access on a commercial level. [16] It is important to report accidents and to follow the correct accident reporting process at work. The accident report form is essential for supplying details about the accident's circumstances, any witnesses to the accident, etc. Such a report is necessary to guide any claim for damages and injuries. Another benefit from putting into practice an employer's accident reporting policy is that it may help prevent similar accidents from happening and the information can be filed for creating an overview/statistic for the single company or department involved. Information from risk assessment needs reports/statistics on injuries occurring makes it possible to evaluate the effect of improvements over time, or to identify new hazards. [16]

### **1.5.2 Injury reporting process**

#### **Local statistics- About statistics at the work site and region**

In most countries, when an injury occurs at a workplace, the employer is responsible for reporting the injury to the authorities and sometimes also to the insurance agencies. Employers most often need to fill in a form that contains the personal information of the injured person, date, time, site or location of the accident, type of accident, and a brief description of what happened. [17]

Other factors such as precise diagnosis, therapy proposed or applied, and predicted time loss may be included in the reporting for compensation purposes, in addition to the items stated above. Health personnel may help with this part of the reporting, and the data gathered in this manner will supplement the company reports. Medical confidentiality should be followed when dealing with medical data. [17]

**Table 5: Reporting, recording and notification: By whom, to whom and about what.** Developed from [18]

	<b>By whom</b>	<b>To whom</b>	<b>What events and information</b>
<b>Oral reporting</b>	Employee	Immediate supervisor, a qualified individual, or any other designated individual or body	Any work-related injury
<b>Written report</b>	Employer (might be delegated to a human resources manager or member of the workplace safety and health committee), independent contractor	National authorities (e.g., labour inspectorate; police when lethal accidents occur)	Occupational injury (often defined as an injury that require medical help and/or absence from work)
<b>Notification, claims</b>	Employer Employee helped by medical personnel	Insurance company compensation fund	Workplace injuries

### **ILO (International labor organization)- Global statistics**

Since 1919, the ILO has brought together governments, companies, and workers from 187 member countries to set labor standards, formulate laws, and implement programs that promote decent employment for all women and men.[19]

ILOSTAT is the database of the ILO. It collects and produces data about different types of work from all around the world. They use different methods for the data collection and production for different topics and countries. ILOSTAT gives users access to extensive worldwide statistics on a variety of labour-related topics. [20]

Various types of administrative data (insurance records, labor inspection records, records kept by the labor ministry or the applicable social security institution), establishment surveys, and household surveys are some of the other possible sources of statistics about occupational injuries that could be included, but such data is not regularly or reliably reported in all countries.[21]

National systems for the notification of occupational injuries, such as labor inspection records and annual reports, insurance and compensation records, and death registers, are the most reliable data sources for occupational injuries statistics. Household surveys (particularly to cover unincorporated businesses and the self-employed) and/or establishment surveys can be used as a supplement. [21] When analyzing statistics from administrative records, it is important to keep in

mind that statistics on fatal and non-fatal occupational injuries are likely to come from distinct records because they frequently are reported to and compensated by different agencies. Because of this, even if fatal and non-fatal occupational injuries are very complementary, the sources' coverage may not be comparable.[21]

It is not clear from the webpages how the information in the ILO database from the different countries is gathered and handled.

Emails were sent to several ILO representatives in Asia before the study started asking-for their reporting routines. However, we, unfortunately, did not get any response.

### **1.5.3 The purpose of reporting occupational injuries**

#### **A. Reporting is useful for the individual worker, to be able to claim compensation.**

Reporting ensures that all harmful incidents and work-related accidents are documented in writing. It serves as a helpful record of what transpired and may facilitate the worker's future access to benefits, medical care, and compensation. [18]

#### **B. Reporting is useful for statistics- to be able to study changes, and to evaluate whether interventions cause improvements or not**

It is important for an employer in developing and putting into place steps to prevent future occurrences of dangerous events, accident, or sickness. [18] It is commonly acknowledged all over the world that enhanced workplace safety and health, as well as a reduction in occupational accidents and diseases, provide significant economic benefits. To maximize this benefit, a greater understanding of the true state of workplace safety and health at the enterprise, industry, and national levels is required so as to make appropriate decisions. [17] Accurate and reliable accident and disease data are required for effective risk assessment and management in the workplace. [17]

### **1.5.4 Unreported occupational injuries- challenges in reporting**

Keeping accurate records of occupational injuries (OIs) helps to achieve numerous national goals. Measuring the true burden of OIs allows for more accurate estimations of the impact on workers and the economy. Complete documentation also alerts authorities to any concealed differential injury hazards, giving crucial information for correctly allocating limited inspectional resources, as well as guiding the effective implementation of prevention and instructional

programs. Finally, this data allows individual employers to compare their OI experience to that of the respective industry sector, making it easier to identify and solve injury prevention flaws. [22]

Several organizational characteristics have been linked to under-reporting of OIs in previous research. Aside from workplace size, only a few of these have been studied in more detail. A small number of research have suggested that ownership sector (private/public) and amount of economic activity are related to OI underreporting, however the latter findings are inconsistent between studies, most likely due to variability in study populations. The causes for under-reporting injuries are unknown and may differ by country, although perceptions about compensation eligibility, organizational safety climate, and system barriers have all been reported to play a role. [22]

A study which was conducted about under-reporting of non-fatal occupational injuries among precarious and non-precarious workers in Sweden [22] concluded that, in Sweden, workers in precarious employment are more likely to underreport OIs. They may think that because their results are consistent with earlier research from other nations, they can be applied to different settings. Additionally, this study supports the existence of underreporting in particular workforce segments, including young employees, women, and migrant workers, who are renowned in the international literature for their susceptibility in the labor market. Nevertheless, because these groups were not included in the study and might exhibit additional and unidentified mechanisms in addition to those mentioned here, their findings cannot be applied to employees who are self-employed or who work for small businesses.

## **1.6 Rationale for the present study**

Although ILO and other organizations claim that the fishing, farming, and forestry are among the most dangerous activities in the world, literature searches in various occupational health related data bases do not generate many published studies about occupational injury rates in these occupational groups. Moreover, among European countries, France, United Kingdom, and Spain are among the top 10 countries globally in agriculture, forestry, and fishing. [23] France, with 245,248 companies, is the nation with the most businesses engaged in agriculture, forestry, and fishing in the world.[23]

The study aims to raise awareness on the importance of preventing injuries in these high-risk occupations, in the hope that this increased awareness will contribute to safer workplaces. The study has chosen to focus upon occupational injuries in fishing, farming and forestry in southeast Asia, Europe, and Australia. The reason for choosing these areas was primarily to focus upon southeast Asia, as this area has several low-income countries, but also to compare the figures here with injury rates in high-income countries. This study might be of benefit to workers in fishing, farming and forestry as well as the international labor organization (ILO) and all the countries chosen for this study.

## **1.7 Project objectives**

### **Main aim:**

To obtain information about occupational injuries in fishing, farming and forestry from the international reporting system.

### **Specific aims:**

- 1- Describe national statistics from ILO on occupational injuries (fatal and non-fatal) in fishing, farming and forestry occupations in low-income countries and compare these with statistics from high-income countries.
- 2- Discuss the figures found concerning national injury rates in the specific aim 1 and their usefulness in developing preventive measures to reduce the number of injuries in the 3 areas selected (fishing, farming, and forestry).

### **Hypotheses**

- 1- Low-middle income countries have a higher rate of fatal occupational injuries in fishing, farming, and forestry than high income countries.
- 2- Low middle income countries have a higher rate of non-fatal occupational injuries in fishing, farming, and forestry than high income countries.

## **Chapter 2. Methodology**

### **2.1 Inclusion criteria for countries**

This is a descriptive study. Originally, this study planned to include low-income countries with fishermen in Southeast Asia, but as not all countries of interest have registered injury figures, it was decided to make specific inclusion criteria and to include countries from other geographic regions that could be used for comparison purposes.-The other regions selected were the Pacific Islands, as these were close to Southeast Asia, and Europe, as this region has many countries where fishing, farming, and forestry are important.

The inclusion criteria were:

1-The country should have registered at least one year of aggregated or separated data for fishing, farming, and forestry in the ILOSTAT database between the years 2010 and 2015. We selected a time period some years back, because we knew that there is a delay between the national reporting of such statistics until the data become available in ILOSTAT. We also were aware that the COVID-19 pandemic has delayed the input of data to the ILO database. Countries may not report their injuries more than every second year (oral information, 2022 from Dr. Y.Samant, The Norwegian Labour Inspection Authority), and in the period of the COVID-19 pandemic, we expected low reporting. Therefore, this time span was chosen, to make it more likely to find data from the countries.

2- The country should have a coastline. This was to ensure that the country had professional fishing activity.

3- The country should be in either Southeast Asia, the Pacific Islands, or Europe.

Based on these criteria, the following countries were included in the study:

**Southeast Asia:** Philippines, Malaysia (lower middle income and upper middle income)

**Europe:** France, United Kingdom, Spain, Norway (high income)

**Pacific islands:** Australia (high income)



### **2.1.1 Data source**

Data was obtained from the ILOSTAT database.

This database has secondary data with no individual names or IDs, and the data is open for any type of analysis or study. It contains labour statistics from all countries reporting to ILO and has a built-in Data Explorer. Technical requirements are having windows as one's operating system and using the Google Chrome Browser

### **2.1.2 Data obtained**

In the selected countries (Malaysia, Philippines, Australia, France, United Kingdom, Norway, and Spain), data were obtained from the ILO database Occupational Safety and Health.

Data was obtained annually in the period of 2010-2015. (Data obtained in September 2022)

The following variables were obtained:

- Number of cases of fatal occupational injuries per 100 000 workers by economic activity
- Number of cases of non-fatal occupational injuries per 100 000 workers by economic activity

For both, types of injuries:

- Aggregated total data for agriculture, forestry, and fishing were obtained, as well as separate data for fishing if available.

## **2.2 Data analysis**

The data found in the ILOSTAT database were plotted into Excel sheets and analyzed by using descriptive statistics. In addition, the data were transferred to the statistical package IBM SPSS Statistics version 28.0.1.0. The data was stored both on a laptop for the master student and in the University of Bergen system for the supervisor.

We planned initially to perform trend analyses of the data, to see if the reported injury figures were increasing or decreasing. However, due to the lack of figures and irregular profiles of the data, this type of analysis was not possible for all countries:-

Poisson regression analyses for trend were performed for countries where the data were available for all 6 years and where a certain trend (positive or negative) seemed to be likely by observation of the descriptive data. This statistical method has been used for the analysis of injury rates in these occupations before [24]

Statistical comparisons of the figures from the LMIC and high-income countries were not

performed due to the low number of LMIC countries included in this study (only the Philippines with complete aggregated data, and Malaysia with only data from fishing).

### **2.3 Ethics**

We only used secondary data from the ILO database, which contains no names and IDs. In Norway, there is no requirement for ethical approval for studies using secondary data. Also, the present study reports figures of injuries only, not specific diagnosis or any other health information.

The study has been performed while focusing on how to present the data in the best manner, to make the text as good as possible, so it could be used to improve the work environment for the occupations studied. Reporting high injury rates is not positive for any occupation, but here it was important to provide the correct information, to be able to provide a basis for improving the situation if possible.

## **Chapter 3. Results and discussion**

The study analyzed both fatal and non-fatal injuries per 100 000 workers in the fishing, farming and forestry industries 2010-2015 from seven countries (NB one country only had data concerning fishing).

### **3.1 Non-fatal injuries**

Table 2 indicates the number of non-fatal occupational injuries per 100 000 workers in fishing, farming, and forestry between 2010 and 2015. Here Malaysia was an exception and only had fishing data. The table show clearly the lack of data from the Philippines and Malaysia, while full data are present from Australia and the European countries. From 2010 to 2015, France had the highest rate of non-fatal injuries by the year 2011, and the lowest value was from Malaysia in 2015. Based on values over the years, there were fluctuations in rates during the defined study period of 2010 to 2015, and it was not possible to identify any clear increasing or decreasing trends.

**Table 2:** Non- fatal injury rates per 100 000 employed in fishing, farming and forestry Industries (2010-2015)

Year	Non-fatal Occupational Injuries						
	Rate						
	Norway	United Kingdom	France	Spain	Australia	Malaysia*	Philippines
2010	459.6	1837	154.1	2525.7	1803	-	-
2011	506.5	2245.5	16 249.2	2247.8	1796.8	655	-
2012	932	2163.9	211.5	3737.7	1940.2	350	-
2013	423.6	2171.7	180.1	3976.8	2016	651	1309.9
2014	563.5	2457.4	5118.2	5480.7	1724.9	-	-
2015	653.8	2055.8	5223	4366.5	1915.1	319	1349

\*These data are just for fishing industry

Figures 1 to 6 illustrate the number of non-fatal injuries per 100 000 workers between 2010 to 2015 in each country by line graph. To draw a line graph, we needed at least two consecutive years of data, therefore it was not possible to make a line graph for the Philippines. The Figures show the fluctuations from 2010 to 2015.

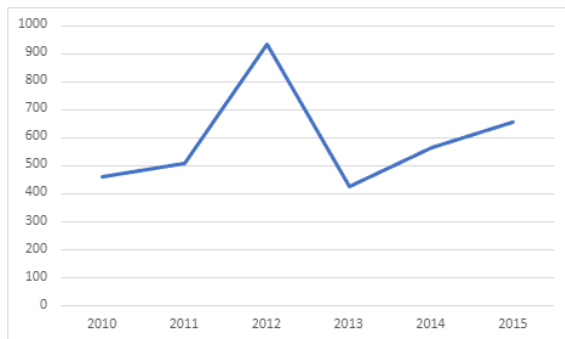


Figure 1, Norway

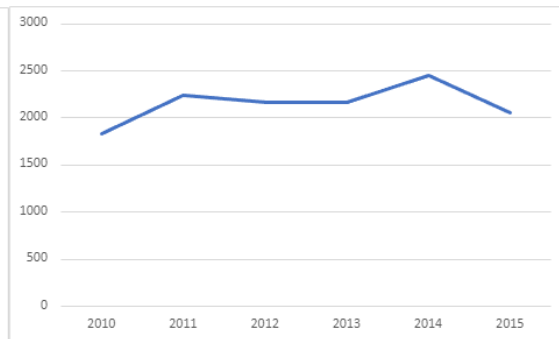


Figure 2, United Kingdom

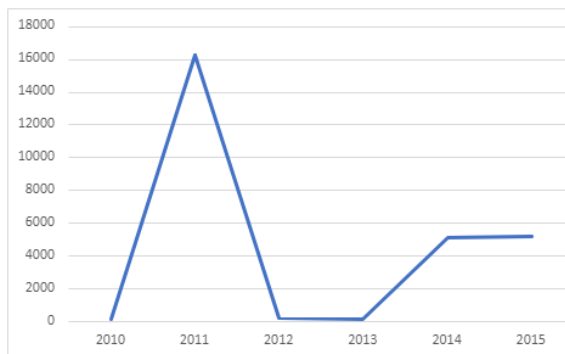


Figure 3, France

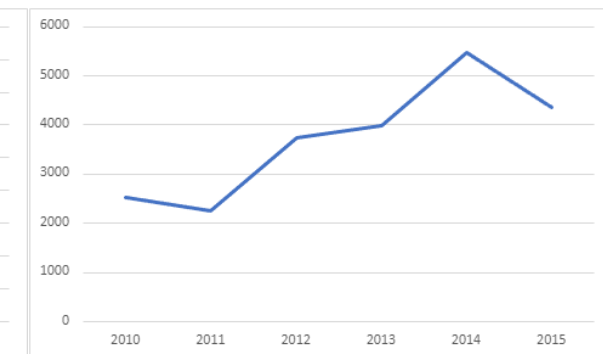


Figure 4, Spain

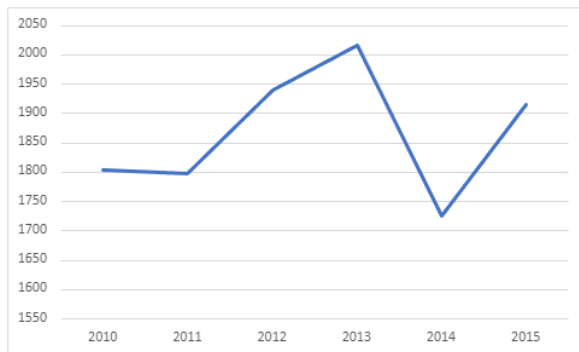


Figure 5, Australia

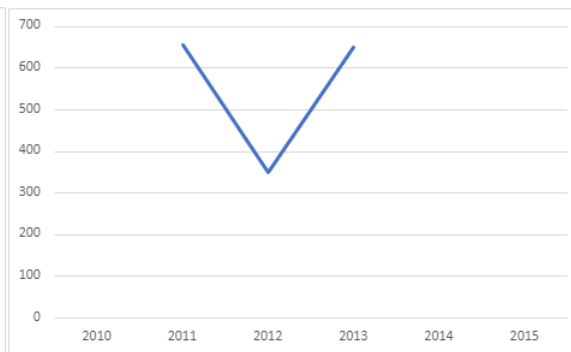


Figure 6, Malaysia

**Figure 1-6.** National injury rates for the number of non-fatal injuries per 100 000 workers between 2010 to 2015 in each country.

Table 3 shows the average of non-fatal injuries in fishing, farming and forestry per 100 000 workers from 2010 to 2015 from each of the seven countries included.

Based on the values provided in this table, the highest number was found for France (4522,68/100 000) and the lowest number was seen for Malaysia-(493.75/100 000). However, the data from Malaysia include only fishing. In Europe and Australia from 2010 to 2015 there were no missing data so, based on the mean it can be concluded that Norway had the best situation in terms of non-fatal injuries among European countries, Australia was second best and France had the highest mean figure. In southeast Asia, the-Philippines had a lower mean number than all except Norway- A figure is also added, to enable these results to be visualized more easily (Figure 7)

**Table3:** Mean numbers of non-fatal injuries per 100 000 workers in fishing, farming and forestry, (2010-2015), reported to ILO from seven countries.

Norway	UK	France	Spain	Australia	Malaysia*	Philippines
589.83	2155.21	4522.68	3722.53	1866	493.75	1329.45

\*Only fishing data

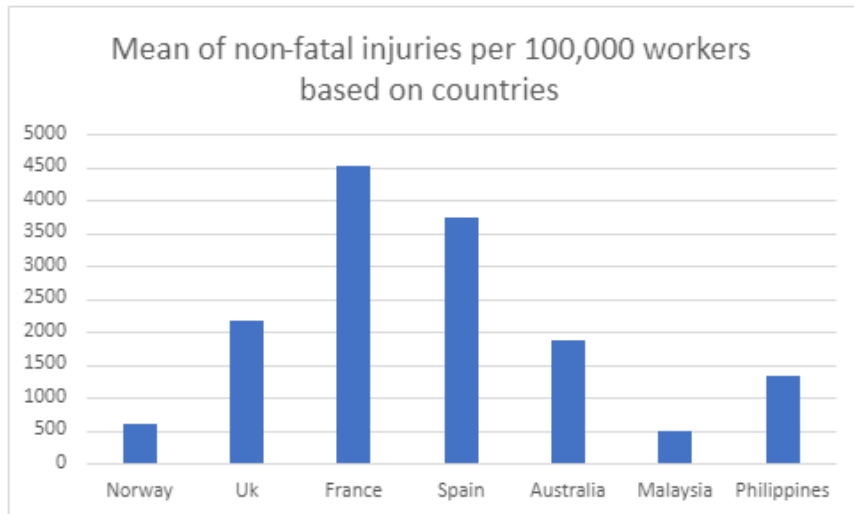


Figure (7): Mean numbers of non-fatal injuries per 100 000 workers in fishing, farming and forestry, (2010-2015), reported to ILO from seven countries.

### 3.2 Fatal injuries

Table 4 shows the number of fatal occupational injuries per 100 000 workers in fishing, farming and forestry from our seven countries between 2010 and 2015.-Malaysia was an exception and only had fishing data. Compared to Table 2 about non-fatal injuries, the Philippines reported results for one more year concerning-fatal injuries. The Philippines did not report the number of non-fatal injuries in 2011 but they reported the fatal ones. Based on the data from France for the period 2010 to 2011, the rate of fatal injuries was dramatically changed it was 0.8/100 000 in 2010 and increased to 59.6/100 000 in 2011. Afterwards, the figures dropped again, to 1.1 in 2012. Also, in Norway there were large changes, with a-rate of 8.1/100 000 in 2010, which increased to 85.5/100 000 in 2014.

**Table 4:** Fatal injury rates per 100 000 employed in Fishing, Farming and Forestry industries (2010-2015)

Year	Fatal occupational Injuries						
	Rate						
	Norway	United Kingdom	France	Spain	Australia	Malaysia*	Philippines
2010	8.1	10.9	0.8	2.8	10.7	-	-
2011	7.4	13.7	59.6	3.9	17.8	48	9.3
2012	10.7	12.9	1.1	6.3	18.6	27	-
2013	18.3	13	0.4	6.3	17	25	48.7
2014	85.5	11	7	11.5	13.9	-	-
2015	28.4	10.1	9.6	6.5	15.6	42	10.9

\* This data is just for fishing industry

Figures 8 to 13 illustrate the number of fatal injuries per 100 000 workers in each country from 2010 to 2015 in line graphs. Again, it is not possible to draw a complete line graph for either the Philippines or Malaysia because the data for some years are lacking. Compared to the non-fatal injuries line graphs for each country, these graphs do not show the same fluctuation. While France and Norway had great changes in some years, the other countries did not have major changes from 2010 to 2015. The United Kingdom and Australia remained more or less constant between 2010 to 2015.

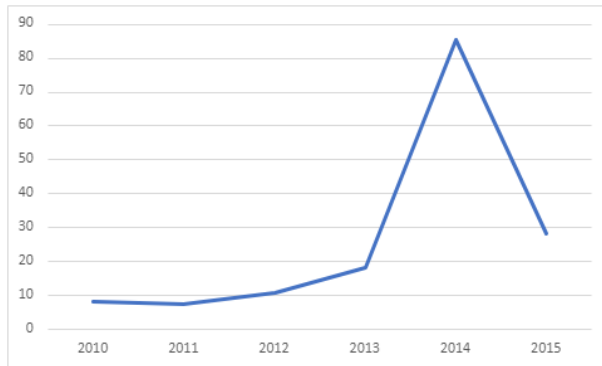


Figure 8, Norway

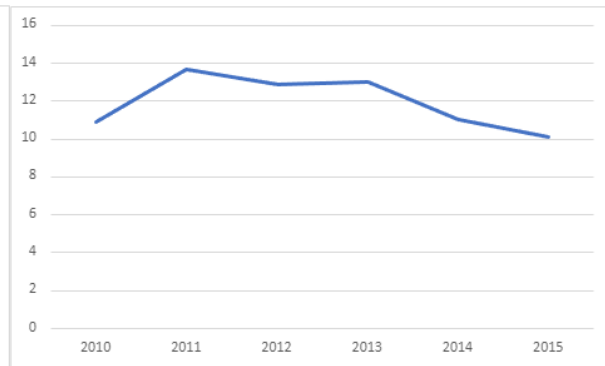


Figure 9, United Kingdom

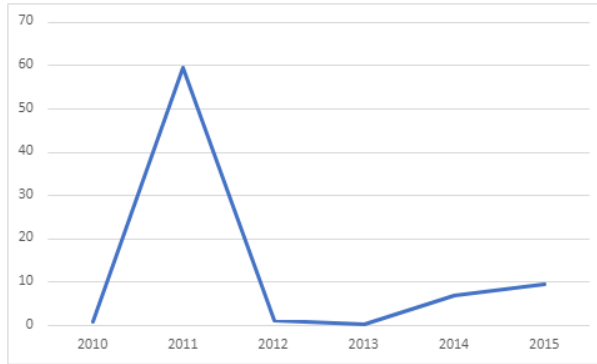


Figure 10, France

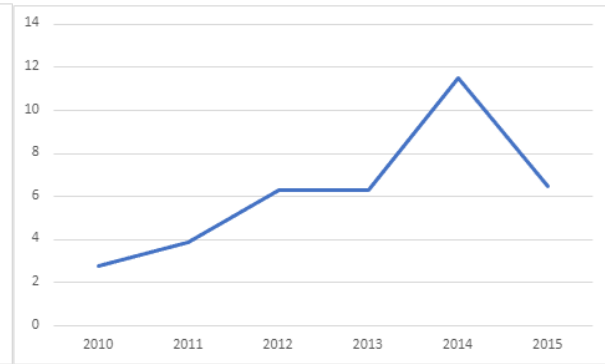


Figure 11, Spain

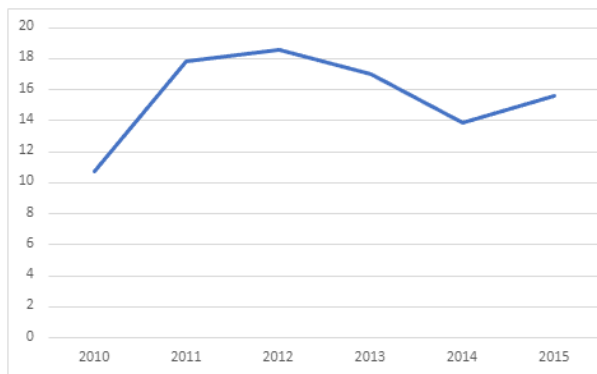


Figure 12, Australia

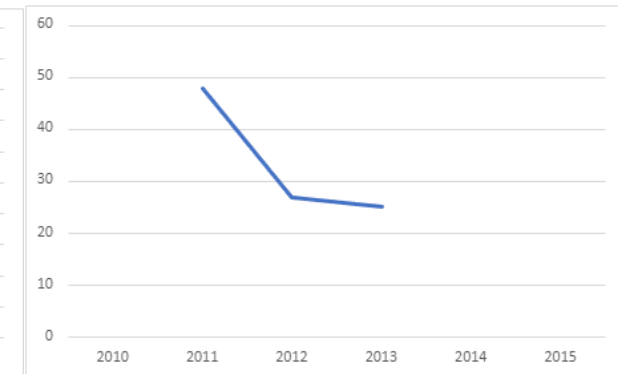


Figure 13, Malaysia\*

\*Fishing only

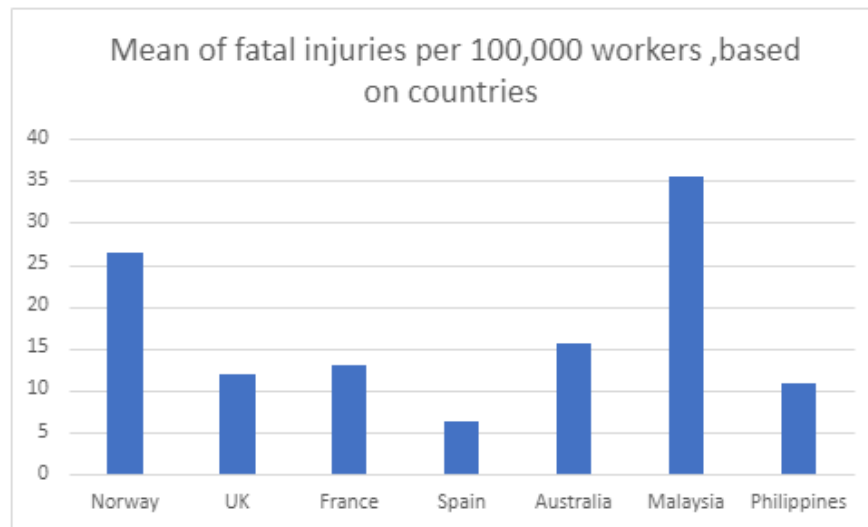
**Fig. 8-13** National injury rates from the ILO report for the number of fatal injuries per 100,000 workers between 2010 to 2015 in seven countries.

Table 5 shows the average of each country fatal injuries per 100 000 workers from 2010 to 2015. While Norway had the lowest mean of non-fatal injuries among European countries, it had the highest average of fatal injuries and Spain had lowest average number of injuries per 100 000 employed from 2010 to 2015 not only between the selected European countries, also it had the lowest mean compared to Australia, Malaysia and Philippines. Malaysia had the highest average, even though only fishing is reported. A figure from the same data as in Table 5 (Figure 14) is added to visualize the results better.

**Table 5:** Mean of fatal injuries per 100 000 workers in fishing, farming and forestry, from seven countries (2010-2015)

Norway	UK	France	Spain	Australia	Malaysia*	Philippines
26.4	11.9	13.0	6.2	15.6	35.5	10.9

\*Fishing only



**Figure (14):** National injury rates from the ILO report for the number of fatal injuries per 100 000 workers between 2010 to 2015 in seven countries.

Looking at the mean figures for each country 2011-2015 (Table 6 and Table 7), we can see that there has been no clear decreasing or increasing trend over the study period and the rate trends varied for both fatal and non-fatal injuries. However, the mean figures are higher in 2015 than in 2010. Based on the information provided by these two tables, the average of non-fatal injuries, was lowest in 2010, while 2011 had the highest mean. The mean of fatal injuries was reported to be lowest in 2010 and highest in 2014.

**Table 6:** Mean of non-fatal injuries per 100 000 workers based on the years (2010-2015)

2010	2011	2012	2013	2014	2015
1355.8	3950.1	1555.8	1532.7	3068.9	2268.8

**Table 7:** Mean of fatal injuries per 100 000 workers based on the years (2010-2015)

2010	2011	2012	2013	2014	2015
6.66	22.81	12.76	18.38	25.78	17.58



### 3.3 Trend analysis

A trend test was performed by using a general linear regression (Poisson regression) for non-fatal injuries in United Kingdom and Spain and for fatal injuries in United Kingdom and Australia, as these countries had data for all years and the figures suggest there might be a trend. The other results were not tested in this way due to wide rate variations and no clear positive or negative trend for the different values.

**Table 8:** Trend analysis to see if there is any increasing or decreasing trend for fatal injuries in United Kingdom and Australia and non-fatal injuries in Spain and United Kingdom

Countries	<i>B</i> -coefficient	95% confidence interval		p.value
		Upper	Lower	
United Kingdom-Non-fatal	0.023	0.013	0.033	0.001
Spain Non-fatal	0.149	0.141	0.157	0.000
United-Kingdom-Fatal	-0.033	-0.169	0.102	0.629
Australia Fatal	0.020	-0.098	0.138	0.741

According to analysis provided in Table 8 we can see a statistically significant increasing trend for non-fatal injuries in the United Kingdom and Spain. On the other hand, there is no significant trend-for fatal injuries in the United Kingdom and Australia.

### 3.4 Discussion

Our results show significant variations in fatal and non-fatal injury rates in seven countries over the years 2010-2015. Two countries, Spain, and the United Kingdom, had a significant increasing trend of non-fatal injuries, otherwise no clear trends were found. Several countries show high rates, compared to total figures worldwide. Norway had the highest rate of fatal occupational injuries in the year 2014, while France had the highest rate of non-fatal occupational accidents in 2011. The figures from the Philippines and Malaysia are in general lower than for European countries for non-fatal injuries, but higher for Malaysia regarding fatal injuries. Although there has not been any statistical comparative testing performed, and only descriptive analysis, it seems as though Hypothesis 2, which says LMIC countries have a higher rate of non-fatal injuries can be rejected. In terms of Hypothesis 1, Malaysia had the highest rate of fatal injuries, but the data were not complete, and conclusions from this part of the study are not possible. For the year 2014, the fatal occupational injuries rate in Europe was 3.02 per 100

000 workers, however the rate of fatal injuries among the workers in fishing, farming and forestry in the specific countries Norway, Spain, France and UK was above this number in 2014. For example, the rate of fatal injuries in Norway was 85.5 per 100 000 workers in 2014 which is about 30 times more than the total rate of fatality rate in Europe. There was the same situation in Australia in 2014, the total rate of fatal occupational injuries in Oceania was 5.51 per 100 000. However, the fatality rate of injuries among fishing, farming and forestry in Australia in 2014 was 13.9 which is above the total rate of fatal occupational injuries in Oceania.

Very few studies have been done on this topic, therefore that was not easy to compare any of the results with previous studies. A study about the trend of occupational injuries in Korea from 2001 to 2010 was conducted, but this study focused on all industries, not only fishing, farming and agriculture. This study's results indicate an increasing trend of deaths in the construction, forestry, agricultural, and service industries. [25]

Another study was conducted by Abas and coauthors in Malaysia on fatal workplace accidents among non-government workers. [26] This study used the PERKESO national database from 2002 to 2006. The time frame for which computerized data were accessible made it possible to carry out a secondary data analysis. The total number of fatal occupational accident cases in the agricultural industry in Malaysia decreased from 83 cases in 2002 to 53 cases in 2006, a (36%) decrease. The yearly average incidence of fatal injuries also decreased, going from 40.1 per 100 000 workers to 24.0 per 100 000 workers, a (43%) decrease. [26] Based on the data from the Abas study, it can be said that Malaysia has a good national reporting system because it provides complete and consistent data for the majority of the industries. The figures cannot be compared to the results of our present study, as the present study only had data from the Malaysian fishing industry. However, the present data, taken from the ILOSTAT database, does not show that the injury data are complete and consistent, indicating that their international reporting system is weak.

There is also a relevant study from Turkey, which shows a variation in the number of occupational accidents in Turkey between 2000 and 2005 as well as a decline in the number of fatal workplace accidents. [27] The variation was also seen in the present study of ILO data, but a clear decline was not seen. Not all EU Member States have seen a decrease in workplace accidents, according to the report. In the EU, fatal accidents reduced by (21%) and serious

accidents by (6%) between 1998 and 2001.[27] Despite this general lower trend in most Member States, major accident incidence rates rose in Spain (+6%) and the United Kingdom (+10%). According to the results of the present research, non-fatal accident rates were rising in Spain and the United Kingdom. The varying results in different reports underline the need for completeness in data collection at a global level.

As noted, there is incomplete reporting, including from some of the countries involved in this study. The Social Security Institution's (SSI) statistical yearbooks, which are regularly published, were used as the study's data source.[27]

Based on national recording and notification systems, ILO compiles and disseminates global accident statistics and rates. The ILO also helps members improve their processes for notifying and recording occupational accidents and illnesses. However, only a small portion of the 174 ILO member states, or around one-third of them, provide data that is sufficiently credible. [28] Underreporting is common, and in many countries the reporting and compensation systems only cover a limited range of economic activities, excluding important industries such as agriculture, which are known to have higher than average accident frequency rates.[28] These factors all contribute to a lack harmonization in the recording and notification systems. The true picture of workers occupational health and safety is probably worse than what official data suggest because deaths and occupational injuries are frequently not reported in these industries. [28] Possible causes of underreporting include poor reporting systems, no financial incentive for victims to come forward, employers having no enforceable legal requirements, etc. Similarly, countries that have well established reporting and recognition mechanisms may result in reporting high incidence rates. [28]

### **Critical remarks to injury reporting**

The creation of effective preventative interventions requires reliable data on the scope and causes of work-related injuries. However, locating reliable data on workplace accidents in underdeveloped nations has proven to be quite difficult. [29] To identify trends and causes connected to work-related injuries, a Tanzanian study using archive data from the workers' compensation fund from 2016 to 2019 had been conducted. [29] Employees in the information and technology, construction, building, and electricity, gas, and steam industries, as well as teachers, drivers, office workers, and security guards, all had high risks of suffering fatal injuries.

Insights on trends and related factors that are crucial for the formulation and implementation of effective preventative strategies for work-related injuries in Tanzania are provided by the current study.[29]

In underdeveloped nations, information about fatal accidents is better recorded than about non-fatal ones, but the same limitations still apply. At the national level, priorities are currently defined using underreported data and the resulting low estimations, which results in less-than-appropriate preventive actions. [28] ILO member states typically provide both absolute numbers and frequency rates. Absolute figures are less helpful for comparisons within and beyond the reporting field, prevention, and preventative measures. [28] The ILO receives reports that often include details on fatal workplace accidents. Although the latter statistics are very weakly provided, fatal commuter accidents and fatal occupational diseases are frequently but not always separately recorded. If these values are not provided individually, the reliability, comparability, and transparency of the data are all compromised. [28] Underreporting is very likely to occur in developing countries (LIC).[30] Even in the most developed nations, underreporting is probably occurring. A good reporting system ought to be established in all countries. How the reporting is performed might be a topic for future studies, including discussions about improving the reporting systems.

There are numerous obstacles and difficulties when it comes to the accurate reporting of work-related injuries and illnesses. Some employees face linguistic problems. [31] An article written in Canada about the systemic impediments to reporting workplace injuries and illnesses in the context of language challenges. [31] Workers who have language problems are overrepresented in hazardous jobs and face greater risk within jobs due to communication difficulties regarding health and safety as well as disproportionate exposures. Simultaneously, language problems are frequently stated as a reason why immigrants and migrants underreport. [31] This study combines data from two qualitative studies that studied experiences with workers' compensation and return to work for injured workers who face language obstacles, respectively. According to the findings of this research, workers confront numerous reporting problems, including 1) a lack of information, lack of awareness, and deception about workers' compensation 2)Uncertainty about the reason and severity of injuries and illnesses 3)Difficulties contacting and engaging with caregivers 4)Fear and insecurity associated with job, economic, and social insecurity 5) Employers' attempts to convince, manipulate, force, intimidate, and threaten employees to stay

or return to work and either refrain from filing or abandon their claim 6) Workers' perspectives were also influenced by the unpleasant experiences of friends, relatives, and coworkers, as well as their own interactions with the system. [31] Participants viewed the workers' compensation process as lengthy, complex, tedious, arbitrary, combative, impersonal, centered on return to work, and especially difficult to handle in situations including language obstacles. [31] Information provision and linguistic adjustments are insufficient to address disparities. Language accommodations may give injured workers with little more than greater awareness of and easier communication with a fundamentally inequitable system without addressing the policies and practices that put racialized immigrants at risk and underpin underreporting. [31]

The compensation system is the best way to cover all workers' sicknesses and injuries, however it is occasionally limited due to limited resources.[32] A study was undertaken in Korea on the status and predictability of disapproval of Korean workers' compensation insurance for diseases and injuries.[32] To be recognized as an occupational sickness or injury, each case must demonstrate a causal relationship between the accident and the occupational elements, as well as how or what can alter the course of the case in their working environment. Complicated administrative steps are required for cases to be recognized as occupational diseases or injuries. Some occupational disease approval processes take around a year from the onset of the disease to the receipt of an application for insurance coverage.[32]

They gathered the data from The Korea Workers' Compensation and Welfare Service (KCOMWEL), and a prediction model for workers' compensation insurance disapproval was built by combining two machine-learning approaches with a logistic regression model.[32] The results revealed that the prediction model for workers' sickness disapproval by workers' compensation insurance performed well, whereas the prediction model for workers' injury disapproval performed moderately.[32] Long-term initiatives by the KCOMWEL and occupational medicine researchers to develop extensive data on workplace disease and injury claims and additional analysis have the potential to improve undesirable circumstances for occupational disease and injury.[32]

## **Limitations**

This study relies on data from the ILOSTAT database. The database seems to have incomplete data on the occupations selected for the study, as data are missing both for certain years and certain countries, so this is the limitation of the study. Aggregated data for fishing, farming and forestry are useful for comparisons over the years and between countries, but not useful if you want to use the data as a basis for preventive measures for these three different work types, individually. How the data from different countries are gathered is not clear, and ILO does not describe how the data are entered in their database. To handle these challenges in a study is not easy and the conclusions from any study of such data must be interpreted with caution.

The time period in this study was only 5 years, 2010-2015. A longer timespan might have been more interesting, but data were missing from many countries regarding fishing, farming and forestry industries after 2015. The time span was chosen to have as complete data as possible.

The low number of countries included made statistical analyses difficult, and future studies should include higher numbers of countries. This will require updates of the ILO database, to be able to access more data. ILO has not provided any information about whether or not the data present in the database will be updated at a later date.

The fishing industry might be divided into two types, coastal fishing, and international sea fishing. The reporting might be complicated and be one of the reasons for the lack of separate figures for fishing from some countries.

## **Strengths**

The data in this study are from an international source, and it is very difficult to obtain such data from many countries otherwise, especially from fishing, farming, and forestry occupations. Also, there are few studies from these occupations, and this study was a possibility of gaining information about them. However, the data in this study are poor but it is still important study because it identifies poor reporting which can be improved in future.

### **3.5 Future studies suggested**

Information on the three most significant industries in developing nations (fishing, farming, and forestry) is scarce. These encompass more than 50% of all active employment worldwide. It is necessary to conduct more investigations in these industries in order to produce more precise results that can be used for preventive issues. Other types of studies, such as surveys of the relevant populations in some countries or more extensive national studies based on reporting of injuries might be valuable.

If data from ILO are to be used, it will be important to establish a dialogue with the IT department of this institution and to obtain more knowledge about the data in the database.

### **Chapter 4. conclusion**

The study found that there are wide variations in both fatal and non-fatal occupational injuries rates in the selected countries. It was not possible to find a clear, similar trend in injuries over the years for the countries, due to fluctuations in the data. However, according to the results from the ILO data, it can be concluded that the number of occupational injuries in fishing, farming and forestry has not improved from 2010 to 2015. High income countries had higher average of fatal and non-fatal injuries compare to LMIC countries, although high numbers of injuries were seen in Malaysia. However, it should be considered that incomplete data plays an important role in results. Since the data are not complete, interpretation of the results must be taken cautiously. Therefore, the conclusion may not be reliable due to insufficient data.

If the data were sufficient, they could be useful for preventive measures. However, the data obtained in the present study were not clear enough to be valuable for designing specific preventive measures.

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