

## **Occupational diseases among public sector workers: causes and prevention (An analytical study on the development of occupational diseases in the city of Laghouat (the Algerian Republic) during the period (2014-2023))**

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### **Abstract:**

Occupational diseases are one of the most important and thorny health issues faced by workers in various fields of industry and professions. Social scientists in general and health demographers in particular have been interested in this topic. In this research, we will study its concept, conditions, effects, the most important legislation, methods of prevention, and how to deal with it in order to reach a safe and healthy occupational environment.

**Keywords:** Occupational diseases, work injuries, occupational safety, occupational health, work accidents, workers.

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### **INTRODUCTION**

The exploration of occupational diseases encompasses a broad spectrum of health issues that arise as a result of workplace exposures. These conditions often result from chronic exposure to hazardous agents or unhealthy work environments, leading to a decline in overall worker health. Understanding the significance of occupational diseases necessitates a close examination of their multifactorial etiologies, which include chemical, biological, ergonomic, and psychosocial factors. This scrutiny enables a comprehensive framework for assessing risk and implementing effective interventions. Furthermore, distinguishing occupational diseases from work accidents highlights the need for proactive measures, as the latter typically arise from sudden incidents rather than prolonged exposure. Consequently, this relationship underscores the importance of preventive strategies that prioritize worker health and foster safer workplace conditions. The ensuing discussion will elucidate the various types of occupational diseases, the mechanisms contributing to their onset, and the strategies necessary for mitigation and prevention.

Our study was divided into two parts, the first part is theoretical concepts, and the second part is the analytical aspect of the study.

## **I-Part One: The theoretical aspect of the study**

### **1- Overview of Occupational Diseases and Their Significance:**

Occupational diseases represent a significant public health concern arising from prolonged exposure to harmful agents or conditions in the workplace. They encompass a wide array of health issues, ranging from respiratory illnesses due to inhalation of toxic substances to musculoskeletal disorders linked to repetitive motions. Understanding the aetiology of these diseases is critical, as they not only affect employees' quality of life but also impose substantial economic burdens on healthcare systems and employers through lost productivity and increased medical costs. The complexity of these conditions often requires a comprehensive approach that includes both prevention and early intervention strategies. By investigating the link between specific occupational environments and health outcomes, researchers are better positioned to design effective safety protocols and regulatory policies that protect workers, thereby fostering healthier workplaces and enhancing overall employee wellbeing (Ki, 2022). The implications of these efforts extend beyond individual workers, influencing broader societal health and economic stability.

### **2- Concept of Occupational Diseases**

Occupational diseases are characterized by their systemic and often chronic nature, resulting from prolonged exposure to specific workplace hazards. Such diseases can manifest in various forms, from respiratory conditions linked to inhalation of toxic substances to musculoskeletal disorders arising from repetitive strain and ergonomically poor work environments. The relationship between exposure and health outcomes is complex; factors such as duration of exposure, intensity, and individual susceptibility play significant roles in determining the overall risk. Additionally, unlike acute work accidents that may yield immediate and clearly identifiable injuries, occupational diseases develop insidiously over time, complicating their diagnosis and consequences. Understanding this distinction is critical, as effective prevention mandates not only address hazardous conditions but also promote health surveillance and education among workers (Ki, 2022). As such, a comprehensive framework that recognizes both the multifactorial aetiology and the varied manifestations of occupational diseases is essential for advancing occupational health initiatives.

### **A- Definition and Classification of Occupational Diseases:**

Occupational diseases represent a broad category of health conditions arising from workplace exposures and can be classified based on their causal agents, onset mechanisms, and clinical presentations. Generally, these diseases can be divided into two primary categories: those resulting from exposure to specific agents, such as chemical substances, and those arising from ergonomic or psychosocial factors.

For instance, asthma induced by workplace irritants or allergens exemplifies a well-documented occupational condition that underscores the complexity of these diseases. The population-attributable risk of asthma, a prevalent occupational ailment, exemplifies the significant impact of job-related exposures on public health, highlighting the urgent need for preventative measures (Axon, Balmes, Frew, Gannon, & Gannon, 2000). Additionally, there exists a conceptual distinction between naturally occurring diseases and those attributed to human activities, known as artificial diseases, which warrants further exploration within the context of compensation frameworks for affected workers (Hook, 2008). This classification aids in developing targeted interventions and policies to mitigate risks associated with such diseases.

### **B- Causes and Conditions of Occupational Diseases:**

Several interrelated factors contribute to the emergence of occupational diseases, fundamentally shaped by the nature of work environments and industry practices. At the forefront are exposure to hazardous substances, which include chemicals, biological agents, and physical hazards inherent in specific occupations. For instance, occupational exposure to asbestos has been definitively linked to lung diseases such as asbestosis and mesothelioma, illustrating the catastrophic impact of environmental factors on worker health. Additionally, inadequate ventilation systems, lack of personal protective equipment, and insufficient training can exacerbate these conditions, creating a perfect storm for disease outbreaks. The psychosocial environment also plays a pivotal role; high-stress settings or exposure to workplace violence can lead to mental health disorders, which are often overlooked in discussions of occupational diseases. It is essential to understand these multidimensional causes to devise effective prevention strategies and ensure safer working conditions (Sciences, 2017).

### **C- Environmental and Occupational Risk Factors:**

A comprehensive understanding of occupational diseases necessitates an examination of environmental and occupational risk factors, which are increasingly recognized as significant contributors to morbidity and mortality globally. These risk factors encompass a variety of hazardous exposures, including airborne particulates, carcinogens, and ergonomic stressors, which can lead to chronic conditions such as chronic obstructive pulmonary disease (COPD) and asthma. The Global Burden of

Disease 2016 study highlights that in 2016 alone, occupational airborne risks accounted for an estimated 519,000 deaths, predominantly from COPD and asthma, underscoring the critical nature of these exposures in the workplace (Global Burden of Disease GBD 2016 Occupational Chronic Respiratory Risk Factors Collabora et al., 2020). Additionally, an estimated 1.53 million deaths were attributed to various occupational risk factors, indicating that workplace-related hazards demand urgent prevention and control strategies to mitigate these public health concerns (GBD, 2020). Thus, addressing these environmental and occupational risks is essential for enhancing worker health and safety across various industries.

### **3-Prevention and Distinctions from Work Accidents :**

Effective prevention strategies for occupational diseases necessitate a nuanced understanding that distinguishes these conditions from typical work accidents.

While the latter often involves immediate physical injuries resulting from sudden incidents, occupational diseases emerge through prolonged exposure to harmful substances or stressful environments, often developing over time. Implementing robust preventive measures demands a multifaceted approach that includes regular health screenings, employee training programs, and comprehensive workplace safety audits.

These strategies not only mitigate exposure to potential hazards but also promote a culture of safety within organizations. Furthermore, recognizing the long-term nature of occupational diseases emphasizes the importance of proactive measures rather than reactive responses, aligning with contemporary health and safety paradigms which advocate for preventive healthcare. As such, effective prevention requires integrating risk assessment frameworks at all organizational levels, ensuring that employees are not only aware of potential risks but are also equipped with the necessary tools to minimize their occurrence (Barry, 2005).

### **4- Strategies for Prevention and Comparison with Work Accidents :**

A comprehensive approach to safeguarding worker health must prioritize the distinct differences between occupational diseases and work accidents, particularly in preventative strategies. Effective prevention requires a multifaceted methodology, including enhancing community education surrounding risk factors such as exposure to hazardous substances and ergonomic practices. For instance, in industries prone to infections or zoonotic diseases like pox, interventions should highlight the importance of vaccination and disease surveillance in vulnerable populations, such as those working with animals or in healthcare settings (Musuka, 2024).

Furthermore, the integration of risk estimation frameworks can provide a robust foundation for evaluating workplace hazards, enabling organizations to

systematically address both occupational and process safety concerns (Chenani, 2024). By employing these strategies collectively, industries can significantly mitigate health risks, fostering a safer work environment that not only reduces the incidence of work accidents but also minimizes the prevalence of occupational diseases among employees.

## **Part two: An analytical study on the development of occupational diseases in the city of Laghouat (the Algerian Republic between 2013-2023):**

### **1- Research areas:**

#### **A- Spatial and human scope of study:**

The state of Laghouat, one of the fifty-eight Algerian states, bears the number (03) within the administrative division of Algeria. It is bordered to the north by the state of Tiaret, to the west by the state of El Beid, to the south by the state of Ghardaia, and to the east by the state of Djelfa. The capital of the state is the city of Laghouat, which mediates the Saharan Atlas region and, thus, the steppe region.

The population of the state of Laghouat in 2023 was 510,298, including 273,512 males and 236,786 females, 345,521 people living in urban areas, and 164,777 people living in rural areas.

The state of Laghouat is a global economic pole in the field of energy, as it includes the largest gas field in Algeria and one of the largest gas fields in the world and ranks fourth in the world among the largest gas fields in the world, which is located on the territory of the Hassi El Remel district in the state of Laghouat, 550 kilometres south of the capital of Algeria. This gas field extends 70 kilometres from north to south, 50 kilometres from north to south, and 50 kilometres from south to south. The Hassi Raml field was discovered in 1956, coinciding with the discovery of the Hassi Messaoud field, and production began in 1961. The annual production capacity of the Hassi Raml field was estimated at 100 billion cubic metres of natural gas. Natural gas from the Hassi Raml field is transported to the coastal cities of Arzio, Algiers and Skikda.

The field supplies export pipelines such as the Algeria-Europe Gas Pipeline and the Trans-Mediterranean Pipeline. Algeria ranks seventh in the world and first in Africa in the list of gas-exporting countries.

Because of this economic polarity, Algiers is a labour-intensive city with an estimated active population of 273,283, of which 245,899 are employed in the five most important sectors: Agriculture 42121 (17.41%), industry 56488 (28.90%), administration 45237 (18.40%), services (transport, trade, etc.) 9056 (12.52%).

The number of social security members is estimated at 822,203. This high number reflects the strength of the state's economic polarity, which made it an attractive area for people to find jobs, especially in the hydrocarbon sector.

- We now review the number of cases of occupational diseases in the last ten years:

Year	Number of cases		Total
	Male	Female	
2014	05	00	05
2015	10	03	13
2016	09	04	13
2017	07	01	08
2018	06	02	08
2019	08	03	11
2020	04	00	04
2021	01	01	02
2022	05	02	07
2023	06	01	07
<b>Total number</b>	<b>61</b>	<b>17</b>	<b>78</b>

The source was prepared by the student based on data from the National Social Security Fund in 2023.

### **B-Analysis of results:**

According to the statistics shown in Table 01, we notice from 2014 to 2023 that, the number of patients varies from year to year and that the number of people affected by occupational diseases in these ten years reached 78 cases, 61 males and 17 females, meaning that the percentage of males is more than females by 78.2% for males compared to 21.8% for females. We notice from the table that the highest rate of occupational diseases was during the years 2015 and 2016, at 6.6%. We note from the table that the highest rate of occupational diseases was during the years 2015 and 2016, with 13 cases, representing 10 cases for males and 3 for females for the year 2015 and 9 cases for males and 4 for females in 2016, and the lowest rate of occupational diseases in 2021 with two cases, one male and one female.

Through the statistical analysis of the table, we notice that the number of people affected by occupational diseases is very small and almost non-existent compared to the number of workers affiliated with social security, and this is due to the following:

This article is a study of workers who contracted the disease during work and not those who developed the disease after retirement. Retired people are not included in the study, although many occupational diseases do not appear until after retirement for several reasons that we mentioned in the concept of occupational diseases.

- Most work injuries fall within the framework of ordinary diseases or work accidents. However, occupational diseases are defined by the Algerian legislature and set out in tables of 85 occupational diseases, which have not been updated since 2002, despite technological developments in terms of production methods and medical development, especially occupational medicine.
- Lack of reporting of occupational diseases, especially organizations that try to keep the existence of occupational diseases private to avoid prosecution and compensation costs.

Clearer statistics are needed to determine the extent of institutions' commitment to implementing occupational health programmes and help researchers identify the real causes of work injuries in general and occupational diseases in particular.

## **2- Recommendations and conclusions :**

1- Modernizing and updating the tables of occupational diseases is an essential requirement through the concerted efforts of both legislators and doctors to reach legal, regulatory and health texts in order to fill the legal gaps and administrative bureaucracy and to make them more flexible by adding diseases that may appear in the future, and reducing the severity of the conditions to consider the disease as an occupational disease.

2- Activating health programmes related to the work environment to reduce work injuries in general and occupational diseases in particular by increasing awareness and health culture among workers through programmes, training and training courses related to occupational safety.

3- Giving greater powers to the labour inspectorates to monitor institutions and their implementation of occupational health and safety programmes, especially the preventive aspect and the suitability of the working environment and conditions for workers.

4- More empowerment of the role of occupational safety inspectors within institutions to ensure the implementation of occupational safety and security conditions.

5- Requiring institutions to immediately report to employers the existence of occupational diseases and identify the causes and methods of infection by reporting the observations, developments and changes they witness in the health of their workers and the work environment.

6- Avoid long procrastination and administrative bureaucracy regarding compensation for damages during the period of disability, and try to increase the entitlements resulting from occupational disease by increasing disability and ill-health salaries.

### **3- Summary of Key Findings and Implications for Future Research :**

Much of the research on occupational diseases has yielded important insights that emphasize the need for strong preventive frameworks and policies in the workplace. The implications for future research are multifaceted; a deeper exploration of the psychosocial factors that influence occupational health and the effectiveness of current prevention strategies is essential. Engaging multidisciplinary approaches involving industrial hygiene, public health, and policy formulation will not only enhance our understanding of occupational diseases. However, it will also promote the development of more effective interventions, ensuring safer workplaces and improved employee wellbeing.

### **Conclusion:**

Understanding occupational diseases transcends the mere identification of harmful agents present in various workplaces; it encompasses a comprehensive grasp of their prevention and mitigation. The complex interplay between work-related exposures and individual susceptibility underscores the necessity for multifaceted intervention strategies, which must be informed by rigorous empirical research. Effective prevention depends on a combination of organizational accountability, regulatory frameworks, and individual awareness, emphasizing the role of education in safeguarding worker health. Furthermore, distinguishing between occupational diseases and work accidents highlights critical differences that necessitate tailored approaches to worker safety and health policy. By advocating for proactive risk assessments and promoting a culture of safety, stakeholders can significantly reduce the prevalence of occupational diseases, ultimately fostering a healthier workforce. Therefore, consolidating knowledge in this field will not only benefit employees but also enhance organizational productivity and societal wellbeing.

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