

A Comparative Law Analysis of Social Security and Insurance Against Occupational Accidents

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Abstract

This study examines the trends towards updating the legislation on compulsory social insurance against occupational accidents in the Republic of Kazakhstan from a comparative perspective. The analysis is carried out on the axis of the necessity of harmonization of insurance norms within the European Union (EU) and the transposition of International Labour Organization (ILO) standards into national law.

In the study, the current insurance system in Kazakhstan was compared with the occupational accident and occupational disease insurance models applied in the Russian Federation, the European Union and Türkiye. As a result of the examination, it was determined that the systems in Kazakhstan, Russia and Türkiye were mainly compensation-oriented; on the other hand, it has been determined that prevention, risk management and rehabilitation functions have a more institutionalized structure in the European Union.

Within the scope of the research, terminological

inconsistencies and normative contradictions in Kazakhstan legislation were identified; the harmonization of national regulations with ILO standards and the legal infrastructure for the establishment of a common insurance area within the EU were evaluated. The scientific and practical contribution of the study is that it proposes a comprehensive approach that addresses the compensation, rehabilitation and prevention functions of insurance together.

In conclusion, the article provides concrete legislative development recommendations based on comparative law findings, aiming to harmonize Kazakhstan's international obligations with national social protection priorities.

Keywords: Social Insurance, Occupational Accidents, European Union (EU), International Labour Organization, Legislation, Protection Of Employees.

JEL Codes: K22, K31, J28

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1. Introduction

This study examines the compulsory social insurance systems established against occupational accidents in the European Union, the United States, the Russian Federation, Türkiye and Kazakhstan with a comparative perspective in terms of normative structure, institutional capacity and policy orientations. The results of the analysis reveal that the compensation function stands out in all systems, but there are significant differences in terms of the integration of prevention and rehabilitation functions into legal regulations and institutional structures.

The accumulated experience in the field of occupational health and social security shows that insurance systems for occupational accidents and diseases should be continuously improved, especially considering the normative documents of the International Labour Organization (ILO). However, the problems in this area are not at a level that can be solved only by legislative changes or individual administrative measures; Since it is structural and institutional, it requires long-term, comprehensive and innovative approaches.

In this context, the article analyzes the trends for updating the compulsory social insurance legislation implemented by the Republic of Kazakhstan against occupational accidents with a comparative approach. The study focuses on the necessity of harmonization of financial norms within the framework of the European Union (EU) and the process of integration of ILO conventions into national law and comparison law. The current system in Kazakhstan has been evaluated by comparing it with the models in the Russian Federation, European Union countries and Türkiye.

The authors emphasize the importance of institutionalizing social insurance systems that focus on a preventive approach in the process of establishing a common financial market within the EU. For example, in the Russian Federation, the social insurance system is run by the state and is based on premium rates that differ according to the hazard class of the workplace. However, there are criticisms that the system operates mostly on the axis of compensation and that preventive and rehabilitative functions are not sufficiently included in the institutional framework.

Although the insurance systems of the member states differ, the "prevention principle", "risk assessment", "employer obligation" and "employee protection" constitute the basic building blocks of EU social law. Occupational accident insurance systems, especially in countries such as Germany and France, attract attention with their public and occupation-based structure and are supported by strong preventive mechanisms. This structure is highly aligned with ILO standards and recognizes prevention and rehabilitation as an essential component of the system, not just a complement to compensation.

The insurance system against occupational accidents and occupational diseases in Türkiye is carried out within the scope of the Social Security and General Health Insurance Law No. 5510, and the implementation is carried out by the Social Security Institution (SSI). While the system is effective in linking income and providing compensation, the preventive function is largely left to the criminal and administrative regulations under the Occupational Health and Safety Law No. 6331. This situation causes a structural separation between the insurance system and the occupational health and safety regime; It prevents a comprehensive approach in terms of risk management.

In the study, it was stated that the insurance system implemented in Kazakhstan mainly focused on damage compensation, similar to the examples of Russia and Türkiye; on the other hand, it has been determined that preventive and rehabilitative functions are integrated in a more institutionalized way in European Union countries. In addition, terminological ambiguities and normative contradictions have been observed in legal regulations in Kazakhstan; the relationship of national legislation with ILO norms and norm harmonization processes within the framework of the EAEU was evaluated.

Kazakhstan's policies aimed at strengthening the social and legal state structure and its active integration into the EAEU necessitate a integrated harmonization of not only financial but also social policies. In this context, the basic paradigm of the compulsory insurance system against occupational risks needs to be re-evaluated. The insurance system is not just a commercial activity; It should be designed as a public tool that reflects the common social responsibility of the state and the employer. The system should focus not only on compensating for damages, but also on effectively preventing occupational risks and returning workers to the labor market in a productive manner.

The scientific and practical contribution of this article is to make a multidimensional assessment of Kazakhstan's social insurance legislation and to provide concrete recommendations for structural reforms based on comparative experiences. In the context of Eurasian integration, a system that will balance the rights and obligations of the parties in insurance relations, while at the same time compliant with international norms and sensitive to national needs, is proposed. The study is complemented by normative and institutional recommendations that are in line with Kazakhstan's obligations under the ILO and the EEU, incorporating lessons learned from Turkish and EU practices.

The biggest limitation of the current system is that it is based on the understanding of "post-incident response". However, contemporary insurance models and ILO's recommendations aim to ensure that social insurance functions as an active and coordi-

nated tool in risk management. In this context, it is recommended to integrate prevention strategies, rehabilitation mechanisms and compensation tools in a balanced manner (Qazaqstan Respublikasynyñ Prezidentiniñ Jarlyǵy No. 636, 2018).

2. Methodology of the Study

This study adopts a comparative analysis method to evaluate the compulsory social insurance systems carried out against occupational accidents and occupational diseases with their normative, institutional and functional dimensions. The methodological framework is based on both structural-legal analysis and the study of political orientations. More specifically, the study uses the functional method of comparative law. This method compares different legal systems by examining how they respond to a common legal and social problem, rather than merely listing similarities and differences between statutory provisions. In the present study, the common problem is the legal organization of protection against occupational accidents and occupational diseases.

The main method of the study is comparative descriptive analysis, and the functioning of systems in different countries is systematically compared according to certain criteria. In this context, five countries or regional systems have been chosen: the European Union (EU), the United States of America (USA), the Russian Federation (RF), Türkiye and Kazakhstan. The selection criteria are the representation of countries in different social policy traditions, geographical diversity, institutional development levels and participation in normative integration processes. Kazakhstan was selected as the focal jurisdiction because the article aims to evaluate its current legislation and reform needs. The Russian Federation was included due to its post-Soviet legal and institutional background, which makes it a relevant comparator for Kazakhstan. Türkiye was selected because it provides an example of a public social insurance system in which compensation mechanisms under social security law coexist with a separate occupational health and safety regime. The European Union was included as a supranational normative framework in which prevention, risk assessment and worker protection are strongly emphasized. The United States was included as a contrasting model, since its occupational accident compensation regime is more decentralized and shaped largely through workers' compensation schemes and private-law-oriented institutional mechanisms. The analysis was conducted through the following three key dimensions:

- **Normative Structure:** The legal basis of social insurance systems regarding occupational accidents and diseases in the relevant countries has been examined. In this context, national laws

(e.g. Laws No. 5510 and 6331 in Türkiye) and international conventions (such as ILO Convention No. 121) were taken as basis.

- **Institutional Capacity:** Public institutions responsible for the execution of insurance systems (e.g. SSI, Social Insurance Funds, private insurance regulators) and their competencies at the implementation level were evaluated. At the same time, institutional coordination, digitalization level and audit capacities were compared.
- **Policy Orientations:** The weights of "compensation", "prevention" and "rehabilitation" functions in the insurance systems of countries were analyzed. In this context, the extent to which the system is based on passive compensation and to what extent it includes proactive risk prevention policies are examined. In particular, preventive and rehabilitative functions as in the case of Germany and France were compared with the private insurance model in the USA, the state-oriented structure of Russia and the transformation process of Kazakhstan.

Within the scope of the comparative analysis, European Union Framework Directives, ILO standards harmonization processes and national legislation were discussed mutually. In the case of Kazakhstan, the level of compatibility of the current insurance system with both EU and Turkish practices and its future integration potential in the context of the EEU were evaluated.

The study also reveals the terminological and normative inconsistencies observed in national legislation; It emphasizes the need for structural reform to integrate insurance systems with preventive and rehabilitative functions, rather than relying solely on compensation. The comparative findings are therefore used not only for descriptive purposes, but also as a basis for normative evaluation. The analysis shows that systems limited to compensation remain insufficient in preventing occupational risks, whereas models that integrate prevention and rehabilitation provide a more comprehensive form of social protection.

Thanks to this methodological approach, both the functionality of social security systems at the theoretical level and their practical application capacities were evaluated; In the case of Kazakhstan, multi-level policy alignment proposals have been developed. In addition, concrete, normative and institutional reform steps were proposed within the framework of the structural lessons learned from the experience of each country. Thus, the comparative analysis leads to a clear conclusion: Kazakhstan's compulsory insurance system should move from a predominantly post-accident compensation model toward a preventive, rehabilitative and institutionally coordinated model compatible with ILO standards and comparative best practices.

3. Research and Discussion

3.1. Research

3.1.1. Occupational accidents and diseases insurance system in the united states

In the United States, the insurance system for occupational accidents and diseases is complex, which varies on a state basis, and is mostly led by the private sector. The basis of the system in the USA is the liability of employers to the employee and generally operates within the framework of employer-financed workers' compensation insurance. Risk assessment, rehabilitation after occupational accidents and long-term support mechanisms are determined by state-level regulations.

The analysis methods applied in the USA are quite advanced. Systematic risk assessment tools such as HAZOP (Hazard and Operability Analysis), FMEA (Failure Mode and Effect Analysis) and FTA (Fault Tree Analysis) are frequently used in the prevention of industrial accidents (Gendler et al., 2020, s. 82). Thanks to these methods, system failures that may cause accidents are detected and eliminated in advance.

In an important empirical study on this subject, Shin, Ilsoon; Oh, Jun-Byoung and Yi, Kwan Hyung (2011) examined the relationships between occupational accident frequencies and the structure of insurance systems in different OECD countries. According to the findings of the study, it was stated that occupational accidents occur less frequently in countries with private insurance systems than in countries with public insurance systems. In addition, it has been revealed that the application of a flat-rate employer contribution instead of a risk-based premium system yields more stable results because this system provides a more predictable structure to reduce costs (Shin et al., 2011, p. 150).

However, there are also criticized aspects of the system. Due to the state-based structure in the USA, inequalities arise in data collection systematics and service delivery; There may be situations where low-income workers do not receive adequate support. In this context, the performance of the insurance system should be evaluated not only in terms of financial aspects but also in terms of access and effectiveness.

3.1.2. Insurance system for occupational accidents and diseases in the european union

Social security systems developed in the European Union against occupational accidents and diseases include not only providing compensation to injured employees, but also systematic approaches to prevent accidents. Although there are certain differ-

ences between member states, occupational health and safety policies are generally carried out under the coordination of the European Agency for Safety and Health at Work (EU-OSHA) and Eurostat. Policies and practices for the prevention of accidents in these systems; data monitoring has become seriously institutionalized in terms of employer obligations and financing model.

Risk-based premiumization method is used especially in the systems applied in Germany, France, the Netherlands and Scandinavian countries. In other words, employers' investments in occupational health and safety can directly affect the amount of insurance premiums they will pay. This system not only directs employers to fulfill their legal responsibilities but also to gain financial advantages in insurance premiums by creating safe working environments (Takala et al., 2017, p. 8).

The rate of fatal occupational accidents in these countries is on a downward trend thanks to structural reforms, increased automation in industry, transition to the service sector and strengthening public policies on occupational health. For example, according to 2011 data, there are 0.74 fatal accidents per 100,000 employees in the United Kingdom, while this rate is 0.9 in Germany. These rates are much higher in countries with transition economies, such as Türkiye and Kazakhstan (Takala et al., 2017, p. 9).

In addition, in European countries, not only physical risks, but also "emerging risks" such as psychosocial risks, workplace stress and musculoskeletal diseases have been of interest to insurance systems. This development points to a comprehensive understanding that health in the world of work is threatened not only by visible accidents but also by long-term exposures.

However, there are also significant differences between countries within the EU. For example, Scandinavian countries invest more in proactive preventive approaches such as "Vision Zero", while in Southern European countries, systems are more compensation-based. This situation varies according to the economic capacities, political priorities and historical development processes of countries.

In general, the European Union insurance systems for occupational accidents and occupational diseases; It is structured as a multi-layered protection system that aims to reduce social risks at the national level as well as individual compensation. The development of systems at this level creates significant advantages not only for employers and employees but also for economic sustainability.

In the European Union, protection against occupational injuries is not through a uniform Union insurance system; It is provided through binding directives in the field of occupational health and safety and the national insurance regimes of the member states. EU legislation, especially the Framework Directive

on Occupational Health and Safety No. 89/391/EEC, places the principle of prevention in a central position; It regulates risk assessment, employer liability and employee protection as basic obligations. In countries such as Germany, France and Austria, occupational accident insurance is carried out by public or semi-public occupational insurance organizations; In addition to compensation payments, these organizations provide active prevention programs, rehabilitation services, and technical support for workplaces. The EU approach aims to make insurance an active tool of occupational health and safety policies rather than a passive payment mechanism.

3.1.3. Insurance system for occupational accidents and occupational diseases in türkiye

An occupational accident can be said to exist where a harmful event occurs, the injured person has the status of an insured worker, and the accident falls within one of the circumstances or situations prescribed by law. In this respect, an occupational accident is not merely any harmful event; rather, it is a concept of social security law that must be assessed together with the worker's insured status and the statutory connection criteria (Eker, 2021, p. 35).

However, under Law No. 5510, the concept of occupational accident has not a certain limit, in a narrow sense, to accidents occurring only during the performance of work. Unlike Law No. 6331, Law No. 5510 treats certain accidents occurring outside the workplace or not directly connected with the performance of work as occupational accidents, too. Thus, the term occupational accident should not be interpreted so narrow as referring only to accidents occurring during the actual performance of production or service activities (Ekmekçi, Köme Akpulat, & Akdeniz, 2022, pp. 181–182). In fact, in a analysis of Turkish social security law, accidents suffered due to work carried out by the employer are also examined as one of the main manifestations of the concept of occupational accident (Zehiroğlu, 2024, p. 4).

The insurance system for occupational accidents and occupational diseases in Türkiye operates with the compulsory insurance model carried out within the Social Security Institution (SSI). In this system, which is financed by premiums paid by employers, the insurance coverage is quite wide: various services are offered, such as temporary incapacity allowance, permanent incapacity income, salary to beneficiaries in case of death, and coverage of treatment expenses.

However, the criticism that the system in Türkiye is largely compensation-oriented and that preventive activities and control mechanisms are not at the desired level comes to the fore. Occupational accidents are more frequent in sectors such as const-

ruktion and agriculture, where unregistered work is high, and this situation both reduces the inclusiveness of the insurance system and affects the reliability of the data.

In international comparisons, it is seen that Türkiye's fatal occupational accident rate is higher than many developed countries. Takala et al. (2017), in their study including Türkiye, pointed out that occupational accidents do not decrease if the economic transformation is not supported by sufficient occupational health and safety investments (Takala et al., 2017, p. 7).

In order to prevent occupational accidents in Türkiye, not only the insurance system, but also preventive policy tools and employers' audit obligations need to be strengthened.

In Türkiye, the compulsory insurance system against occupational accidents and occupational diseases is carried out by the Social Security Institution within the framework of the Social Security and General Health Insurance Law No. 5510. Although the system strongly fulfills the functions of compensation and income linking, the prevention function is largely left to the administrative and penal mechanisms regulated under the Occupational Health and Safety Law No. 6331. This situation leads to a structural separation between the insurance system and occupational health and safety legislation; Reform discussions also focus on strengthening coordination between these two areas.

The main cause of occupational accidents and occupational diseases in Türkiye is not merely the inadequacy of legal regulations. In many cases, the problem arises from the ineffectiveness of inspection mechanisms, the insufficient development of an occupational safety culture, and the fact that occupational health and safety professionals are not adequately supported in terms of both training and job security. Therefore, in order to reduce occupational accidents, it is essential to strengthen internal workplace supervision as well as external inspection. For this reason, occupational health and safety professionals should receive better and more qualified training and should be protected against employers through stronger and specific job-security guarantees. According to Kutal, well-trained occupational health and safety professionals who have job security will not only make internal supervision more effective, but will also help develop an occupational health and safety culture among employees (Kutal, 2019, pp. 474–475).

3.1.4. Insurance system and preventive approaches in kazakhstan

The insurance system for occupational accidents and diseases in Kazakhstan has been made legally mandatory and is carried out with both the regulatory

role of the state and the enforcement role of private insurance companies. The compulsory insurance law, which came into effect in 2005, required employers to insure their employees against accidents and occupational diseases. However, in recent years, it has been understood that only compensation-oriented systems are insufficient and the preventive insurance approach has started to gain importance. In this context, Abikenova et al. (2023) have evaluated the insurance system implemented in Kazakhstan as not only a means of financial protection but also as a means of risk mitigation. The authors suggest that a portion of insurance funds should be allocated for preventive measures, such as occupational safety training, modernizing work environments, and integrating workplace inspections with digital databases. In the same study, it was stated that a two-component insurance premium system was proposed according to occupational risk levels. In this system, the first component includes the overall premium rate, and the second component includes an additional difference based on the current level of risk in the workplace. Thus, employers are encouraged to provide safe working conditions, and higher insurance premium payments are possible in risky conditions (Abikenova et al., 2023, p. 290-292).

The recent support of occupational health and safety policies with information technologies in Kazakhstan has increased the traceability and auditability of the system. With digital insurance contracts, online audit systems and central risk databases, a more transparent structure has been created for both employers and government institutions.

In this context, Kazakhstan stands out as one of the countries with the most institutional approach to occupational accidents and diseases in the Central Asian region. Although the system has not yet fully reached EU standards, adopting a preventive approach will have cost-reducing and health-protective effects in the long run.

The data provided by the Ministry of Population, Labour and Social Protection of the Republic of Kazakhstan and the institutions affiliated to this Ministry constitute the main primary sources of the research. These data directly contribute to the evaluation of the functioning and effectiveness of the compulsory insurance system implemented in Kazakhstan against occupational accidents related to workers' activities.

The indicators reveal the general trends of the current practice in Kazakhstan and show that the system has a predominantly compensatory structure. The findings were evaluated by comparing the public insurance model in the Russian Federation with the compulsory insurance system carried out by the Social Security Institution in Türkiye.

In the research, a comparative analysis was also made at the institutional level. In this context, the

data of JSC "Life Insurance Company" operating in the insurance market of Kazakhstan were examined. The company's operating results, premium structure and payment practices reveal how the insurance system operates at the micro level; It makes visible the tension between the commercial nature of insurance and the purpose of social protection. Compared to the fact that insurance activities are carried out under more centralized and public supervision in Russia and Türkiye, this situation reveals the unique problems of the institutional structure in Kazakhstan. Thanks to this comparative approach, the structural and institutional limitations of the compulsory insurance system in Kazakhstan have been more clearly identified. In particular, the weakness of preventive mechanisms, institutional fragmentation and the fact that insurance activities are predominantly shaped by commercial objectives become evident when compared to the prevention and rehabilitation-oriented models common in the European Union. This methodological framework allows national practices to be evaluated in the light of international standards and different country experiences (Qazaqstan Respublikasynyñ Prezidentiniñ Qaulysy No. 1569, 1994).

The project proposals are based on the approaches to the development and reform of the compulsory social insurance system in Kazakhstan, which were put forward by the JSC "State Pension Company" and the JSC "State Social Insurance Fund". These proposals aim to transform the structure of the current system, which focuses mainly on post-loss compensation; It aims to transition to a more coordinated model that strengthens prevention, rehabilitation and risk management functions.

3.1.5. Insurance for Occupational Accidents and Diseases in the Russian Federation

The insurance system against occupational accidents and diseases in the Russian Federation was given a legal framework with the "Federal Law No. 125-FZ" adopted in 1998. Under this law, employers are required to compulsorily insure their employees against production-related accidents and illnesses. Although the system is regulated by the public, insurance applications are largely carried out through centralized structures.

Puinko, Lusiena E. (2020) draws attention to the digitalization process of the social insurance system in Russia and states that insurance contracts and audit mechanisms have been moved to digital platforms, thus making the system more effective, traceable and reliable (Puinko, 2020, p. 714).

The risk of occupational accidents in the mining sectors operating in Russia, especially in the Northern regions (e.g. Murmansk and the Komi Republic), is

quite high due to the harsh climatic conditions. The risk structure in these regions depends not only on the workplace environment but also on external environmental factors. Gendler et al. (2020) call this situation "background risk" and emphasize that these external factors should be taken into account in risk analyses (Gendler et al., 2020, p. 81–82).

The authors state that the effect of environmental conditions on occupational accidents can be analyzed with a linear correlation and that technical factors and environmental factors can be separated using the "background risk" model (p. 82). These analyses reveal that occupational health policies should be differentiated regionally in countries with large geographical areas such as Russia.

In addition, Russian academics such as Karnachev and Grishina state that the safety culture in Russia is still in its development stage, with most occupational accidents being linked to operational error and inadequate training. This shows that the insurance system should not only provide financial compensation but also include practices aimed at increasing organizational security.

From a comparative perspective, the insurance system for occupational accidents and diseases in the Russian Federation is carried out by the Social Insurance Fund in a structure with a predominant public nature. In the Russian system, workplaces are divided into risk classes according to the degree of danger of their activities and insurance premiums are determined according to this classification. Although this mechanism ensures that preventive elements are partially integrated into the system, in practice the system mainly focuses on compensation and income linking functions; There are academic criticisms that preventive programs are limited.

3.2. Discussion

3.2.1. International common perspective

It is clear that the system, which is called occupational injury insurance *in the international literature* and compulsory social insurance for activities related to the performance of work or official duties *in national legislation*, needs a further modernization in the face of today's economic and social conditions.

Although important steps have been taken towards harmonizing national legislation with international standards, there are still some contradictory regulations in the current system. It is seen that the compulsory insurance system, especially related to workers' activities, is not effective enough in terms of preventing occupational accidents and occupational diseases and compensating for the damages arising as a result of these risks. This limits the preventive function of insurance and leads to various problems in practice.

In addition, the "mixed system" used to determine the degree of loss of professional working capacity creates problems in terms of social justice in insurance payments. The lack of unified and reliable insurance statistics and separate and comprehensive reports on occupational injury victims, and mismatches between government and agency statistics on occupational accidents further undermine the system's effectiveness. (Qazaqstan Respublikasynyñ Zańy No. 285-VI, 2019).

Finally, the effectiveness of the current corporate structure, in which life insurance companies are involved as operators of the compulsory insurance system, is especially important. In this context, ensuring the balance between the financial sustainability of these institutions and their obligations to fulfill their social missions plays a decisive role. Today, due to the dominance of the commercial activity logic and conceptual incompatibilities, it is seen that insurance programs that can perform prevention, rehabilitation and compensation functions simultaneously and holistically are limited worldwide.

Retrospective evaluations reveal that occupational injury insurance programs implemented in economically developed countries are institutionally established, operate effectively and have a high social value. These systems stand out as structures that aim not only to compensate for loss of income but also to increase safety in working life and protect the workforce.

Workplace injury insurance programs have their historical origins in 19th-century Europe. The first national regulation in this field was implemented in 1884 with the law passed in Germany under the leadership of Chancellor Otto von Bismarck and formed the basis of modern occupational injury insurance systems. This regulation has been decisive in the development of social insurance not only as an individual guarantee tool, but also as an institutional reflection of the social responsibility of the state (Burdygina, 2007).

In some countries, occupational injury insurance systems rely heavily on a preventive approach. The main purpose of these systems is to improve working conditions and occupational safety standards in order to reduce the number of accidents that occur in workplaces. This goal is achieved by differentiating insurance premiums according to the risk level of workplaces or by actively supporting and financing preventive and awareness-raising activities. Such practices strengthen employers' sense of responsibility and contribute to the development of insurance culture in the long run.

Some trends emerging on a global scale make the need for reform in occupational injury insurance systems even more evident. In particular, the emergence and rapid spread of new technologies are transforming the nature of occupational risks; In

addition, it creates new opportunities in the fields of risk prevention, occupational medicine practices and rehabilitation. These developments necessitate a more flexible, preventive and integrated structure of insurance systems (Núrǵaliev, 2021).

Global competition and economic transformations lead to radical changes in the employment structure. In this process, while the weight of the industrial sector decreased, there was a significant shift in the workforce towards the service sector. At the same time, workplace organizations are transforming; Non-standard forms of employment such as part-time, temporary and contract work are becoming widespread. The development of private entrepreneurship, technological progress and the increase in automation gradually reduce the need for physical labor.

Demographic trends also directly affect the structure of the workforce. The increase in the level of education, the increase in women's participation in the labor force, the increase in life expectancy and the decrease in fertility rates lead to significant changes in both the quantity and quality of the labor force. These developments are reshaping the structural characteristics and quality of the workforce.

The experience of economically developed countries reveals the necessity of continuous modernization of occupational injury insurance systems. In this context, it is important to strengthen legal regulations that increase the responsibility and motivation of employers to reduce occupational injuries and diseases. The approach in question; It aims to effectively implement preventive measures, mitigate the consequences of loss of working capacity, regain lost work capacity and reduce preventable deaths.

The International Labour Organization (ILO) emphasizes that a holistic approach should be adopted in the development of compulsory insurance systems against occupational injuries and diseases, addressing the functions of prevention, rehabilitation and compensation together.

3.2.2. European Union

European Union countries have important advantages such as risk-based premiumization, strong control mechanisms and low mortality rates in insurance systems created against occupational accidents and diseases. However, differences in implementation between member states and the lack of preventive funds in some countries are among the factors that limit the effectiveness of the system. On the other hand, the dissemination of preventive policies such as Vision Zero and the implementation of AI-supported risk monitoring systems offer significant opportunities for EU countries. However, reducing investments in occupational health and safety during economic crises poses a potential threat.

In the European Union, the risk-based approach is at the center of occupational health and safety policy. In accordance with the Framework Directive 89/391/EEC on Occupational Health and Safety, employers are obliged to assess occupational risks in the workplace in advance, take the necessary preventive measures and reduce the risks at the source. In many member states (especially Germany, the Netherlands and the Nordic countries) these risk assessments have been directly linked to the determination of social insurance contributions and the financing of preventive programmes. In this way, the risk-based approach functions not only as an administrative obligation but also as an economic incentive mechanism.

3.2.3. United states of America

The USA has strengths in occupational health, such as advanced risk analysis methods (e.g., HAZOP, FTA) and the efficiency provided by the private sector. However, the fragmented nature of the interstate system and the difficulties faced by low-income workers in accessing services stand out as the weak points of the system. Steps such as the implementation of standardization policies at the federal level and the development of digital audit systems offer important opportunities to strengthen the system. On the other hand, the persistence of system inequality and the lack of integration with health insurance pose a threat to sustainability.

3.2.4. Russian federation

In the Russian Federation, too, the insurance system for occupational accidents and diseases is based on a risk classification in which workplaces are divided according to hazard classes. In this system, implemented by the Social Insurance Fund (as of 2023, the Russian Social Fund), premium rates are determined according to the risk level of the workplace and aim to encourage employers to provide safer working conditions. However, it is stated in academic evaluations that this approach often remains compensation-oriented in practice, and the risk prevention dimension can be implemented to a limited extent.

3.2.5. In Türkiye

In Türkiye, the risk-based approach is mainly regulated within the framework of the Occupational Health and Safety Law No. 6331. This Law imposes an obligation on employers to conduct risk assessments, take preventive measures, and inform employees. However, there is no structural integrity between the social insurance system (occupational accidents and occupational diseases insurance carried out by SSI within the scope of Law No. 5510) and occupational health and safety legislation. Although risk assess-

ments are important in terms of administrative and criminal sanctions, the systematic differentiation of insurance premiums according to the risk level remains limited.

Social protection of citizens, together with social security and social support mechanisms, constitute the basic elements of the social policy of the state in Russia, Türkiye and European Union countries as well as in Kazakhstan. The current social policy approach prioritizes strengthening social justice and social welfare, the active participation of individuals in economic life and ensuring safe conditions in working life. This approach aims to transform social insurance systems into preventive and strengthening tools, rather than just compensating for loss of income.

In this context, the state develops various programs and policy tools in line with the new social contract understanding and creates conditions that encourage employers to create new employment areas. Active labor market policies and social insurance incentives in the European Union; Employment incentives and premium supports in Türkiye; In Russia, on the other hand, publicly supported employment programs are concrete examples of this approach. For Kazakhstan, the comprehensive implementation of social insurance and occupational health and safety policies based on a risk-based approach is considered as an important tool that can contribute to both the protection of workers and sustainable economic growth (Qazaqstan Respublikasynyñ Prezidentiniñ Jarlyǵy No. 949, 2002).

In accordance with the legal regulations in force, employers are not only responsible for the provision of social benefits; It is also explicitly responsible for creating safe working conditions and preventing occupational injuries and diseases.

This responsibility is implemented through compulsory occupational accident insurance mechanisms developed in line with the basic principles adopted by the International Labour Organization (ILO) and on the basis of plans, models and programs implemented in developed countries and international organizations. These mechanisms have emerged as a result of policy choices aimed at strengthening social protection against occupational accidents and systematically implementing preventive approaches (IAIS, 2019).

Insurance has an important place in the economy as a sub-field of the financial sector. This importance of insurance; The way it emerges is shaped by numerous legal regulations that have an impact on its development process and the regulatory functions it undertakes in different sectors.

3.2.6. Kazakhstan

An analysis of the current legislation shows that national regulations are generally in line with internati-

onal standards, but there are several shortcomings, gaps and normative contradictions in practice. These problems are particularly evident in the differences in conceptual definitions.

In this context, Article 1, paragraph 27 of the Labor Code of the Republic of Kazakhstan defines an event connected with workers' activities as a situation resulting in injury, sudden deterioration of health, temporary or permanent loss of working capacity or death that occurs while performing his/her duties on behalf of the employee's own employer or the sending employer or on the instructions of the receiving party (Petrov, 2020).

The Law of the Republic of Kazakhstan "On compulsory insurance against injury to an employee in the performance of his work (official) duties" provides for the determination of the degree of loss of professional working capacity suffered by employees who are injured or died as a result of exposure to harmful and/or dangerous factors of production, Occupational Accidents, sudden deterioration in health, occupational diseases or poisoning in the performance of their professional duties. This issue is regulated in Article 16-1 of the Law, and under certain conditions, these events are considered as occupational accidents.

However, it is seen that the said Law refers to some norms that are not included in the current text of the Labor Code of the Republic of Kazakhstan. This situation leads to normative incompatibilities between basic legislative texts and uncertainties in practice. The historical analysis of the amendments shows that since the entry into force of the Labor Law on January 1, 2016, the said Law has been amended 18 times, but none of these amendments include provisions to eliminate the structural problems arising in Articles 16-1 and 22.

On the other hand, within the framework of the project titled "Economic Problems of Secure Labor and Institutional Transformation of the Insurance Mechanism in the Republic of Kazakhstan", scientific research on working conditions and labor security is carried out by the Labor Protection Research Institute within the scope of targeted program funding. These studies revealed that the statistical data kept by different public institutions and organizations regarding occupational accidents do not coincide with each other. This situation significantly complicates state oversight and evidence-based policy development processes.

The main reason why the current statistics do not fully reflect the number of insured employees is that in Kazakhstani legislation, insurance is not made directly through employees, but through employers and workplaces. In addition, although the International Labour Organization (ILO) norms have been transposed into national legislation, it has been determined that preventive mechanisms are not used effectively enough in practice.

In this comparative framework, the reforms proposed in Kazakhstan aim to redefine the role of insurance institutions, institutionally strengthen non-compensatory functions and bring insurance activities more in line with the principles of the welfare state. The experiences of Russia, the European Union and Türkiye show that a successful transformation is not only with institutional restructuring; It shows that it is possible by considering risk-based bonus systems, effective audit mechanisms, reliable statistical infrastructure and social dialogue tools together.

Opinion and policy documents have made a significant contribution to understanding the direction of transformation in the system and current debates in professional circles. A comprehensive analysis of these documents reveals that the problem under consideration is multidimensional, structurally complex, and of high social importance. Monographs, academic articles and thesis studies on social insurance, occupational health and safety and occupational risk management also confirm the topicality of the research topic both at the international level and in terms of Kazakhstan.

The last stage of political and legal development in the country is closely related to the implementation of the State Legal Reform Program and the subsequent implementation of the Legal Policy Concepts (2002 to the present). These documents determined the direction and priorities of all legislative areas, starting from constitutional law; envisaged the conceptual reconsideration of labor law and the social insurance system. In this process, codified laws were adopted, implementation mechanisms were developed and legal awareness was strengthened at the social level.

Finally, the second paragraph of Article 24 of the Constitution of the Republic of Kazakhstan provides the constitutional basis for compulsory social insurance reforms, guaranteeing everyone's right to safe and hygienic working conditions, fair wages without discrimination, and social protection against unemployment (Qazaqstan Respublikasynyñ Konstituciyası, 1995).

The National Development Plan until 2025 envisages a specific method based on a risk-based approach in the field of occupational safety and health. According to this approach, risk assessment makes it possible to systematically identify harmful and dangerous factors arising from production processes in each workplace and to reduce the risk of occupational accidents and occupational diseases. This understanding aligns with the International Labour Organization's (ILO) emphasis on preventive policies and modern social security approaches.

The main strengths of the insurance system in Kazakhstan include the allocation of funds for preventive activities, the proposal for a two-component premium system, and the development of digital audit mechanisms. However, as the system is still in the

process of development, there may be infrastructure deficiencies in some areas. Steps such as harmonization with European Union models and dissemination of occupational safety trainings offer opportunities for the development of the system. On the other hand, the interruption of the continuity of implementation by political changes and the limited industrial investments are important threats.

4. Conclusion and Comparative Policy Recommendations

This study comparatively examined the compulsory social insurance systems against occupational accidents in the European Union, USA, RF, Türkiye and Kazakhstan in terms of normative structure, institutional capacity and policy orientations. The findings show that the compensation function stands out as the basic element of social insurance in these systems; on the other hand, it reveals that there are significant differences in the integration of prevention and rehabilitation functions (risk-management and reintegration mechanisms) into the legal and institutional framework.

The results of the analysis show that the compulsory social insurance system against occupational accidents in Kazakhstan faces structural problems that limit its development and weaken its social function. The current system exhibits a structure that focuses on compensating for the damages incurred rather than being a tool to prevent risks.

4.1. Joint International Recommendations

At the international level, standardized data systems should be developed on the basis of the definitions recommended by organizations such as ILO and WHO in order to carry out reporting, premiumization and prevention activities for occupational accidents and diseases more effectively. Differentiated bonus systems based on risk level should be implemented in all countries, ensuring that workers in high-risk sectors receive higher protection. Additionally, practices such as tax incentives for preventive actions and low premium advantages should encourage employers' investments in occupational health and safety.

4.1.1. Suggestions from the EU

The experience of the European Union reveals that an effective occupational injury insurance system should include the principles of prevention, rehabilitation and fair compensation in an integrated manner. In this context, it is possible to adapt the good practices developed in the EU to the conditions of Kazakhstan.

First of all, it is necessary to develop a preventive occupational health and safety culture. The EU Framework Directive on Occupational Safety and He-

alth (89/391/EEC) imposes an obligation on employers to assess and mitigate occupational risks. In order to effectively implement this approach in Kazakhstan, it is important to put economic incentive mechanisms in place. Differentiated insurance premiums based on working conditions and occupational accident statistics can prompt employers to take preventive measures.

Such an approach is in line with the practices adopted by professional insurance associations (Berufsgenossenschaften) in financing preventive programs in Germany and can contribute to transforming the insurance system from a mere compensation payer to an active risk management tool (Sapařgaliev, 2019).

Secondly, it is necessary to create an integrated operator that combines compensation, rehabilitation and prevention functions into a single structure. In the models widely applied in the European Union countries, private insurance funds or public agencies (especially in the cases of Austria and Finland) gather compensation payments, medical and vocational rehabilitation services and the organization of preventive activities in a single center. Structuring the State Social Insurance Fund in Kazakhstan in line with this understanding will ensure more effective use of resources, reduce corporate conflicts of interest and allow the system to be managed holistically. Thirdly, standardization and integration of accounting, monitoring, and data collection processes are imperative. In order to produce reliable and comparable statistics, it is necessary to establish a unified data collection system in line with European standards. In this context, a structure similar to the European System of Accident at Work Statistics (ESAW) will make it possible to analyze the causes of accidents at work, to establish comparative indicators and to develop targeted preventive measures.

In this context, the strategic objective of the reform is not only to improve the system with limited and superficial regulations; but to comprehensively transform it from a structure based on compensation to a proactive, preventive and socially strong model. Such a transformation will not only contribute to the effective protection of the right to safe work guaranteed in the Constitution of Kazakhstan, but will also make it possible to strengthen employee rights, increase labor productivity and support the competitiveness of the national economy. It will also serve to create a healthy, safe and sustainable working environment.

In the European Union, compulsory social insurance is not only a compensatory mechanism against occupational accidents; it is implemented as a holistic coordinated social policy tool structured in line with the objectives of preventing risks, increasing workplace safety and rehabilitating employees. In Union law, proactive risk management, employer responsibility and inter-institutional coordination come to

the fore; this approach strengthens the preventive and restorative dimensions of social insurance in line with the standards of the International Labour Organization (ILO).

4.1.2. Suggestions from the USA

In the United States, common data definitions should be established at the federal level to ensure the comparability of occupational accident and occupational disease data between states. Low-cost and accessible "microinsurance" schemes should be implemented so that low-income, migrant or temporary workers can also benefit from the system. In addition, artificial intelligence-based early warning and monitoring systems should be developed and supported in order to detect dangerous trends in industrial organizations in advance.

4.1.3. Recommendations for the Russian Federation

The strengths of the system for occupational health and safety in the Russian Federation include the background risk model, the existence of a compulsory insurance law, and the process of digitalization. However, regional inequalities occur due to geographical size and climatic difficulties, and the lack of sufficient development of occupational safety culture is among the weaknesses of the system. Practices such as the development of regional risk analysis systems and the creation of databases at the national level offer important opportunities. However, especially in the northern regions, the loss of manpower, old infrastructure and high risk levels in the mining sector pose a threat.

In order to effectively analyze the differences arising from climatic and geographical conditions in Russia, it should be ensured that the background risk model is integrated into legal regulations. Region-specific inspection teams with special budgets should be formed for high-risk regions (e.g. Polar region, Siberia). All processes of the social insurance system should be transferred to the digital environment and open data access should be provided for transparency.

4.1.4. Recommendations for Türkiye

The social insurance system in Türkiye, especially within the framework of the Social Insurance and General Health Insurance Law No. 5510, is largely in harmony with the European Union acquis and International Labour Organization (ILO) conventions at the normative level. However, the ongoing structural incompatibilities between legislation and practice draw attention. The preventive function of the system remains weak, the compensation-based approach comes to the fore and institutional capa-

city is not used effectively enough. This situation becomes even more evident, especially in sectors such as construction and agriculture, where unregistered employment is common.

The limited inspection capacity in the field of occupational health and safety, the low level of employer awareness and the lack of coordination between institutions significantly reduce the effectiveness of the social insurance system. Additionally, the decrease in public investments in this field during economic fluctuations and the limited use of digital infrastructure are among the factors that threaten the sustainability of the system. On the other hand, developing e-Government infrastructure, increasing the employment of occupational health experts and benefiting from international good practices offer important opportunities to improve the current situation.

In this context, the following policy recommendations have been developed in order to make Türkiye's social insurance system more effective and integrated:

- The preventive insurance approach should be strengthened. Occupational health and safety risk assessments, workplace monitoring mechanisms, and preventive financing tools should be integrated directly into insurance legislation.
- Insurance premiums should be differentiated according to the risk level and occupational health and safety performance of the workplaces. This system will encourage employers to create safer working environments.
- Mobile inspection teams should be established to combat unregistered work; these teams should be supported by e-Government-based integrated data systems.
- A "Preventive Risk Fund" should be established within the Social Security Institution, which is financed by employer contribution and will be used only in preventive activities.
- Cultural transformation should be supported through education policies. Occupational health and safety courses should be made compulsory in vocational high schools and technical departments of universities.
- Rehabilitation mechanisms after Occupational Accidents and reintegration into the labor market should be developed. Thus, the restorative and regenerative aspect of the social insurance system will be strengthened.
- Multi-layered prevention strategies such as Vision Zero, which are implemented in EU countries, should be adapted to the Turkish context and disseminated at the national level.

These recommendations are not only by ensuring legislative harmonization in Türkiye's social insurance system; At the same time, it will contribute to ap-

proaching international standards by increasing the quality of application and institutional effectiveness. This transformation will support the concrete implementation of the social state principle and strengthen long-term social welfare.

4.1.5. Recommendations for Kazakhstan

Although the compulsory social insurance system in the Republic of Kazakhstan for events related to business activities has been formally brought closer to international standards, its actual effectiveness is still not sufficient. Low insurance coverage, limited improvement of insurance conditions (maximum 33%), as well as the institution of "mixed" liability applied in determining the degree of occupational incapacity for work lead to social injustice. This situation prevents full and fair compensation for damages caused by occupational accidents and occupational diseases (Baiterekova et al., 2025, p. 124–125).

However, the research findings clearly reveal the inadequacies in institutional and information infrastructure. The lack of a uniform and reliable insurance statistics, the lack of an individual registration system for occupational accident victims, the incompatibilities between public and institutional statistics, and the inability to establish an integrated database system seriously limit the state's capacity to monitor and produce effective policies. Furthermore, existing life insurance companies struggle to balance financial sustainability with social mission, leading to a weakening of the social aspect of the system (Baiterekova et al., 2025, p. 125–126).

In this context, the further modernization of the occupational accident insurance system should be based on the implementation of the prevention, rehabilitation and compensation functions envisaged by the International Labour Organization (ILO) with a comprehensive approach. The development of new technologies, structural transformations in the labor market and demographic trends change the nature of occupational risks; This situation necessitates the reconsideration of legal regulations. Therefore, national legislation needs to be structured in a way that encourages employers to take preventive measures, mitigates the consequences of occupational diseases and accidents, and supports the recovery of labor force (Baiterekova et al., 2025, p. 126–127).

The proposed approach envisages the standardization of the conceptual framework for a uniform definition of occupational accidents. In order to increase the effectiveness of compulsory employee accident insurance under Kazakhstan's legislation, it is possible to strengthen the institutional structure and carry out social insurance by a single fund (operator) (Smatlayev et al., 2023, p. 48) .

The compulsory social insurance system in Kazakhstan is in the process of transformation due to inter-

national obligations and integration processes within the framework of the Eurasian Economic Union (EEU). However, the preventive dimension of the system remains limited; institutional fragmentation, terminological ambiguities in legislation and irregularities in practice weaken the impact of the social state principle in the field.

Within this structural framework, the proposed policy steps for Kazakhstan are listed below:

- The two-component premium system (basic premium + risk level difference) should be included in the legislation and started to be implemented on a sectoral basis. This model will encourage employers to make preventive investments in high-risk sectors.
- Insurance legislation should be harmonized with the ILO's Convention No. 121 and the EAEU's common financial markets regulations. This harmonization process should position social insurance as a public service policy.
- By creating a "National Risk Map", the risk levels of all sectors and workplaces should be monitored with digital systems and these data should be made public.
- Occupational safety trainings should be subject to strict supervision by the state, even if they are carried out through insurance companies. The outputs of the trainings must be certified with national qualification certificates.
- Institutional coordination mechanisms should be strengthened. Communication and task sharing between social security institutions, supervisory authorities and local governments should be clarified.
- Rehabilitation and labour market reintegration mechanisms should be developed inspired by EU examples. Occupational recovery processes after occupational accidents will support the restorative dimension of social insurance.

These proposals will make Kazakhstan's social insurance system more holistic, accountable and risk-based, aligning it with both national goals and regional obligations.

5. Conclusion

This study examined the compulsory social insurance systems applied against occupational accidents in the European Union, the United States, the Russian Federation, Türkiye and Kazakhstan in a comparative framework in terms of normative structure, institutional capacity and policy orientations. The main findings of the study can be summarized under three headings: first, the dominant role of compensation; second, the insufficient institutionalization of prevention and rehabilitation in some systems; and third, the need for stronger coordination between

insurance, occupational health and safety, and labour-market reintegration policies. The findings show that the compensation function is at the center of the system in all countries; however, it revealed that there are significant structural differences in the integration of complementary functions such as prevention and rehabilitation into the institutional and legal framework.

The example of the European Union shows that with the principles of proactive risk management, employer obligation and institutional coordination, it is possible to structure social insurance not only as a compensation mechanism, but also as a preventive and restorative social policy tool. While the US model offers flexibility in areas such as technological innovation and microinsurance despite state-based applications; The Russian Federation model is notable for its "background risk" approach specific to geographical and environmental risks. Accordingly, the comparative analysis shows that the most effective systems are those that combine compensation with preventive financing, reliable data collection, workplace-based risk assessment and post-accident rehabilitation.

Türkiye and Kazakhstan, on the other hand, stand out as countries where the compensation-oriented structure is dominant in practice and there are serious deficiencies in the integration of prevention and rehabilitation functions into the system, although they comply with international norms to a large extent in their social insurance legislation. In particular, informal employment, poor institutional coordination, inadequate data infrastructure and lack of preventive financing mechanisms are the main factors that reduce the effectiveness of the system in these countries. For this reason, the findings concerning Türkiye and Kazakhstan should be presented not as separate and lengthy country descriptions, but as common reform priorities: stronger inspection, more reliable data infrastructure, risk-based financing, better trained occupational health and safety professionals, and effective rehabilitation mechanisms. For Türkiye, the main reform required is to strengthen supervision in the fight against occupational accidents and occupational diseases, and in particular to make internal workplace supervision more effective. To this end, occupational health and safety professionals should receive more qualified and practice-oriented training; institutions providing such training should be subject to strict supervision and should preferably be limited to universities and public institutions. In addition, occupational safety specialists and workplace physicians should be granted stronger, special job security against employers. Their contracts should be terminated only on grounds, and compensation for non-reinstatement and lost wages should be set at a deterrent level. In this way, occupational health and safety professionals would be able to perform their duties independently

and contribute more effectively to the development of a safety culture in workplaces. This point may be shortened in the final version, since the conclusion should not repeat the detailed country-specific recommendations already discussed in the previous sections.

In this context, the policy steps proposed in the study are; It includes multidimensional reform proposals such as risk-based premiumization, digital monitoring systems, strengthening institutional coordination, cultural transformation through education, development of rehabilitation mechanisms after occupational accidents and ensuring prevention-rehabilitation-compensation balance. More systematically, these recommendations can be grouped into five categories: (i) legal harmonization with ILO and comparative standards; (ii) institutional coordination between insurance bodies, labour inspectorates and health authorities; (iii) preventive financing through risk-based premiums and dedicated funds; (iv) reliable and integrated data systems; and (v) rehabilitation and reintegration of injured workers into the labour market. In addition, the standardization of data collection processes in line with ILO standards and European Union practices will make it possible for social insurance to become more transparent, accountable and compatible with the principle of the social state.

As a result, the success of social insurance systems established against occupational accidents is not limited to normative compliance. An effective system; It requires a structure in which preventive approaches are institutionalized, rehabilitation is strengthened and the entire process is managed in a data-based, transparent and participatory manner. Therefore, the core conclusion of the study is that legal compliance alone is not sufficient. Social insurance must be transformed from a post-accident payment mechanism into an integrated risk-management system. In this context, the strategic goal of the reform for countries such as Kazakhstan and Türkiye is to move away from the traditional understanding based on compensation and to make social insurance an active risk management and social development tool. This transformation will contribute not only to strengthening employee rights but also to increasing the efficiency and sustainability of national economies.

In conclusion, the comparative findings show that the future of occupational accident insurance lies in an integrated model combining compensation, prevention, rehabilitation, reliable data governance and institutional coordination. For Kazakhstan and Türkiye, the main reform priority is to move beyond a predominantly compensation-oriented model and to establish a preventive, data-based and socially protective insurance system compatible with ILO standards and comparative best practices.

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