



Distributive Justice in Social Guarantees for Workers in Hazardous Working Conditions

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ABSTRACT

The system of social guarantees for workers engaged in harmful and dangerous working conditions remains an important element of social protection. The purpose of the study is to assess the distributional fairness of the current system of social guarantees in Kazakhstan, compare it with foreign models and determine the possibilities of transition from a list-based to a risk-based mechanism for providing guarantees. The research methods include comparative institutional and legal analysis, targeted content analysis of legislation, descriptive statistical analysis, as well as an assessment of the financial and incentive effects of the proposed reform. The initial data cover the legislation of 11 countries — six CIS countries (Kazakhstan, Russia, Belarus, Uzbekistan, Kyrgyzstan, Armenia) and five OECD countries (USA, Germany, Great Britain, France, Canada), as well as data from the form of the Bureau of National Statistics of the Republic of Kazakhstan for 2021-2025. The results showed that the number of employees receiving at least one social guarantee remained virtually unchanged, while the share of those covered by guarantees decreased from 41.54% to 38.75% (-2.79 percentage points). Employers' expenses increased from 167.9 to 341.9 billion tenge, that is, by 2.04 times in nominal terms and by 26.4% in real terms the expression. The proposed transition to the differentiation of guarantees according to the measured risk level and the contribution scale of 3-9% allows maintaining fiscal neutrality and at the same time creating an economic incentive for the employer to reduce occupational risk.

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Зиянды еңбек жағдайларында жұмыс істейтін қызметкерлерге арналған әлеуметтік кепілдіктердегі бөлу әділдігі

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ТҮЙІН

Зиянды және қауіпті еңбек жағдайларында жұмыс істейтін қызметкерлерге берілетін әлеуметтік кепілдіктер жүйесі әлеуметтік қорғаудың маңызды элементі болып қала береді. Зерттеудің мақсаты – Қазақстандағы қолданыстағы әлеуметтік кепілдіктер жүйесінің бөлу әділдігін бағалау, оны шетелдік модельдермен салыстыру және кепілдіктерді ұсынудың тізімдік тетігінен тәуекелге бағдарланған тетікке көшу мүмкіндіктерін айқындау. Зерттеу әдістері салыстырмалы институционалдық-құқықтық талдауды, заңнаманың бағытталған контент-талдауын, сипаттамалық статистикалық талдауды, сондай-ақ ұсынылып отырған реформаның қаржылық және ынталандырушы әсерлерін бағалауды қамтиды. Бастапқы деректер 11 елдің — ТМД-ның алты елінің (Қазақстан, Ресей, Беларусь, Өзбекстан, Қырғызстан, Армения) және ЭЫДҰ-ның бес елінің (АҚШ, Германия, Ұлыбритания, Франция, Канада) заңнамасын, сондай-ақ Қазақстан Республикасы Ұлттық статистика бюросының 2021–2025 жылдарға арналған нысан деректерін қамтиды. Нәтижелер кемінде бір әлеуметтік кепілдік алатын қызметкерлер саны іс жүзінде өзгермегенін, ал кепілдіктермен қамтылғандардың үлесі 41,54%-дан 38,75%-ға дейін төмендегенін (– 2,79 т.п.) көрсетті. Жұмыс берушілердің шығыстары 167,9-дан 341,9 млрд теңгеге дейін өсті, яғни номиналды мәнде 2.04 есе және нақты мәнде 26.4%-ға артты. Бір алушыға шаққандағы шығыстар 246,2-ден 501,4 мың теңгеге дейін ұлғайды. Кепілдіктерді өлшенген тәуекел деңгейіне және 3–9% жарна шкаласына сәйкес саралауға ұсынылатын көшу фискалдық бейтараптықты сақтауға және сонымен бірге жұмыс берушінің кәсіптік тәуекелді төмендетуіне экономикалық ынталандыру қалыптастыруға мүмкіндік береді.

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Распределительная справедливость социальных гарантий для работников во вредных условиях труда

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АННОТАЦИЯ

Система социальных гарантий работникам, занятым во вредных и опасных условиях труда, остается важным элементом социальной защиты. Цель исследования – оценить распределительную справедливость действующей системы социальных гарантий в Казахстане, сопоставить ее с зарубежными моделями и определить возможности перехода от перечневого к риск-ориентированному механизму предоставления гарантий. Методы исследования включают сравнительный институционально-правовой анализ, направленный контент-анализ законодательства, описательный статистический анализ, а также оценку финансовых и стимулирующих эффектов предлагаемой реформы. Исходные данные охватывают законодательство 11 стран — шести стран СНГ (Казахстан, Россия, Беларусь, Узбекистан, Кыргызстан, Армения) и пяти стран ОЭСР (США, Германия, Великобритания, Франция, Канада), а также данные формы Бюро национальной статистики Республики Казахстан за 2021–2025 гг. Результаты показали, что число работников, получающих хотя бы одну социальную гарантию, практически не изменилось, тогда как доля охваченных гарантиями снизилась с 41,54% до 38,75% (–2,79 п.п.). Расходы работодателей выросли с 167,9 до 341,9 млрд тенге, то есть в 2.04 раза в номинальном выражении и на 26.4% в реальном выражении. Расходы на одного получателя увеличились с 246,2 до 501,4 тыс. тенге. Предлагаемый переход к дифференциации гарантий по измеренному уровню риска и шкале взносов 3–9% позволяет сохранить фискальную нейтральность и одновременно сформировать экономический стимул работодателя к снижению профессионального риска.

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1. Introduction

The Concept of Safe Labour of the Republic of Kazakhstan for 2024–2030 (approved by Government Decree No. 1182 of 28 December 2023) commits the country to a risk-oriented approach to occupational safety. The workplace-level instrument required for this reform — mandatory occupational risk assessment — has been required by law since 2020 (Order No. 363). Yet entitlement to each of the five statutory social guarantees for work in hazardous conditions — increased wages, additional paid leave, reduced working time, therapeutic-preventive nutrition, and mandatory occupational pension contributions — is determined not by the assessed level of risk but by whether the worker’s occupation appears on a centrally approved List of 8,940 positions (Order No. 1053 of 28 December 2015), which derives directly from the Soviet List of 1974 (Decree No. 298/P-22).

This disconnection between the risk-assessment instrument required by the reform and the basis actually used to determine entitlement is the subject of the present study. Two workers exposed to identical hazards at the same enterprise may receive different levels of protection because only one of their occupational titles appears on the List. Similarly, two enterprises with entirely different risk profiles may be subject to the same mandatory occupational pension contribution (MOPC) rate of 5 per cent of payroll because the contribution rate is not differentiated by hazard class. The workplace-level risk assessment introduced in 2020 has no legal consequence for either entitlement or contribution rates.

The study addresses three questions. What distributive pattern does each design — the list-based compensatory model prevalent in the CIS and the preventive-insurance model prevalent in the OECD — produce, and at whose expense? What is the empirical record of the Kazakhstani system over 2021–2025 under the current allocative rule? What legislative and administrative changes are needed to align entitlement with measured risk, at what aggregate cost, and with what implementation risks?

The purpose of the study is to assess the distributional fairness of the current system of social guarantees in Kazakhstan, compare it with foreign models and determine the possibilities of transition from a list-based to a risk-based mechanism for providing guarantees. The research methods include comparative institutional and legal analysis, targeted content analysis of legislation, descriptive statistical analysis, as well as an assessment of the financial and incentive effects of the proposed reform.

The article proceeds as follows. Section 2 presents the theoretical framework, drawing on the economics of compensating wage differentials, the literature on social protection and distributive justice, and comparative approaches to occupational safety regulation. Section 3 describes the research methods: comparative institutional and legal analysis, directed content analysis, descriptive statistical analysis of Form 1-T data, and an ex ante framework for assessing fiscal effects and employer incentives. Section 4 presents the empirical results. Section 5 discusses the proposed reform. Section 6 concludes. The full legislative package, the extended instrument-level comparison, and the implementation risk register are presented in Appendices A, B, and C.

2. Literature review

The intellectual foundation of any hazard-pay institution is the theory of compensating wage differentials: in a competitive labour market, jobs carrying higher risk must pay more, and the premium is the price of risk. Viscusi and Aldy (2003) report such premiums across several hundred estimates and derive value-of-statistical-life figures from them that underpin regulatory cost-benefit analysis. The following prescription is minimalist: if the market already prices risk, mandatory benefits are redundant.

The position is contested at its empirical root. Dorman and Hagstrom (1998), re-estimating the wage-risk relationship with controls for industry effects, find the premium fragile and largely an artefact of specification. Dorman and Boden (2021) extend the critique: where premiums are detected they accrue disproportionately to unionised, better-paid and already advantaged workers, while those most exposed capture little or none. The compensating differential, on this reading, is not a mechanism that prices risk but a mirror of bargaining power. Benach et al. (2014), in their review of precarious employment as a social determinant of health, draw from public health on the same conclusion: exposure is stratified by employment status, and the workers who accumulate the most exposure are precisely those least able to negotiate its price.

The debate bears directly on the present study, because the CIS list-based model is a compensating-wage-differential mechanism made mandatory by statute: the state does what the market is assumed to do. If the underlying mechanism is contested in the labour markets where it was theorised, its statutory replication deserves scrutiny rather than assumption.

The question raised by the critics - who receives compensation, and on what basis? - is one of distributive justice. Two forms of inequity are analytically distinct. Vertical inequity arises when workers facing different levels of risk receive the same protection; horizontal inequity arises when workers facing the same risk receive different protection. The social protection literature has concentrated on the first: the the International Labour Organization (ILO, 2024) documents coverage gaps concentrated among informal and low-income workers, and Benach et al. (2014) show how such gaps compound health inequalities.

Horizontal inequity has received far less attention, and here the post-Soviet design is distinctive. Because entitlement is triggered by an occupational title rather than by measured exposure, the List produces both false negatives (exposed workers whose title is absent) and false positives (listed workers with negligible actual exposure). Neither the hazard-pay nor the social protection literature captures this mechanism, since in both the entitlement is at least nominally attached to the risk itself. This is the analytical space the study occupies.

Assessing a system of guarantees requires a criterion of success. Eurofound's job-quality framework provides one such evaluation, assessing work along several dimensions: physical environment, work intensity, working-time quality, social environment, skills and discretion, and prospects and earnings (Eurofound, 2026). It makes explicit a trade-off that compensatory systems obscure: a wage supplement improves the earnings dimension while leaving the physical environment untouched, and may even entrench it, since the supplement raises the worker's cost of leaving the hazardous post. A system that maximises compensation is therefore not a system that maximises job quality - a distinction the CIS literature has not systematically drawn.

The preventive-insurance alternative charges the employer for exposure rather than paying the worker for it, through premiums that vary with the enterprise's loss record. Paridon et al. (2007) describe the German Berufsgenossenschaften as integrating prevention, rehabilitation and compensation within a single frame financed entirely by employers. Elsler et al. (2010), in a review

of case studies of economic incentives across European jurisdictions, show that the German sectoral funds are one of several institutional forms in which the same principle operates, and that the practical effectiveness of each form depends less on the theoretical design than on measurement integrity and enforcement capacity. In the United Kingdom, Russ (2010) documents that the "so far as is reasonably practicable" duty places the burden of risk assessment on the employer, with the Health and Safety Executive inspecting the quality of assessment rather than prescribing it - a structural feature that Almond and Esbester (2018) argue underpins the perceived legitimacy of the regime, and that they later diagnose as strained by pandemic-era demands (Almond & Esbester, 2023).

The empirical record on whether this prevents injury is equivocal. Ruser (1985) found greater experience rating associated with lower injury rates, and Tompa et al. (2007) concluded that there is moderate evidence that it reduces injuries - a finding qualified by the Cochrane review, which found the evidence on inspections inconclusive (Mischke et al., 2013). Against this, Thomason and Pozzebon (2002) showed that firms respond at least as much by intensifying claims management as by improving safety, and Lengagne (2016) found the incentive concentrated on post-injury disability management rather than primary prevention. Canadian evidence converges on the same qualification: Ison (2015) documents that experience rating in provincial workers' compensation boards has produced systematic underreporting, and MacEachen et al. (2012) demonstrate that the cost signal has driven the outsourcing of hazardous work to temporary agencies rather than its elimination - a mechanism Endicott (2025) treats as a structural feature rather than an implementation flaw. Kankaanpää (2010) and Clayton (2012) converge on a qualified verdict: price signals change employer behaviour, but not necessarily towards eliminating the hazard. A recent synthesis by Vitrano and Micheli (2024) reaches the same conclusion regarding intervention effectiveness generally.

The French *compte professionnel de prévention* (C2P) occupies an analytically distinctive position in this debate: it is neither a list-based compensatory mechanism nor a pure insurance-priced preventive one, but a hybrid delivering entitlements through a personalised points account tied to measured exposure to a defined set of risk factors. Kerbrat and Descatha (2018) evaluate the operational instruments used to assign points, testing a job-exposure matrix approach against the multidisciplinary committee that decides early retirement entitlement, and show that measurement complexity is a first-order design constraint. Jolivet (2011) documents that the 2010 statutory definition of arduous work operated less through direct compensation than through employer incentives to negotiate prevention agreements - an incentive structure the 2017 reform partially unwound by removing four of the ten assessment factors on grounds of measurement complexity. Natali et al. (2016), in a comparative review of retirement regimes for workers in arduous or hazardous jobs across Europe, situate C2P as one of several European responses that individualise entitlement while attempting to preserve the preventive-insurance logic - a design choice that carries implementation costs specific to the measurement of exposure at the individual level.

Research on the post-Soviet block is dominated by legal and occupational-medicine perspectives, and remains uneven across the six CIS states in scope. Bukhtiyarov et al. (2021, 2022) develop a health-risk-based standards platform and analyse the integration of working-conditions assessment tools for forming occupational risk levels, but do not compare guarantee systems across countries. Russia's transition to a special assessment of working conditions is widely treated in the

Russian-language literature as the most important departure from the Soviet template within the CIS, yet its distributional consequences remain largely unexamined in the peer-reviewed literature. For Belarus, Cherevko et al. (2024) provide the most recent empirical analysis of the workforce employed in harmful conditions and its coverage by compensation over 2012-2022, documenting a moderate downward trend in accompanied by a 1.5-fold contraction in the number of workers receiving any compensation - evidence that risk-informed regulation, where present, produces measurable reallocation of protection. The dominant instruments of compensation in Belarus over the period were, in descending order, additional paid leave, increased wages, and, marginally, therapeutic-preventive nutrition - a composition matching the CIS template. For Armenia, Aleksanyan and Aleksanyan (2022) analyse the non-resilience of institutions of social partnership after the 2018 political transition and document that the trade-union mechanism through which labour-protection instruments are meant to be enforced remains structurally weak - an institutional constraint that any risk-oriented reform must factor into its enforcement design. For Kazakhstan, Bekmagambetov et al. (2024) conduct a normative-legal analysis of the current system of guarantees for workers employed in heavy, harmful and hazardous conditions, and identify the same design pathology this study addresses at the comparative level: the persistence of the list-based approach and the resulting fragmentation of entitlement across incompatible legal bases. Yensebayeva et al. (2025) survey international practice for Kazakhstan but do not construct a comparative framework. For Central Asia, Imankulova and Dzhusupov (2018) find that regional systems respond to insurance cases rather than prevent them, and that much labour-protection law is declarative because compliance is weak - an assessment of institutional capacity that constrains what any reform may assume about enforcement. Dzhusupov et al. (2018) reach a converging finding through a review of higher education in occupational safety and health across Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan: the professional infrastructure through which any risk-oriented reform would have to operate is uneven and, in several jurisdictions, thinly staffed. Chen et al. (2020) and Kathayat et al. (2025) confirm the comparative advantages of risk-oriented systems in East and South-East Asia; a recent ILO (2026) working paper reaches the same conclusion through a comparative analysis of financing arrangements across six national systems. Neither the East Asian evidence nor the ILO synthesis addresses the post-Soviet case directly.

Three gaps follow. First, no study compares CIS and OECD guarantee systems within a single evaluative framework; the two literatures do not meet, and the peer-reviewed evidence base for the non-Russian CIS states remains uneven - with recent single-country empirical work available for Belarus (Cherevko et al., 2024) and institutional analysis for Armenia (Aleksanyan & Aleksanyan, 2022), but with no equivalent cross-country synthesis anchoring these single-country findings in a common analytical framework. Second, the theoretical status of the post-Soviet List - a statutory compensating-wage-differential mechanism carrying a horizontal-inequity defect of its own - has not been articulated. Third, reform proposals for Kazakhstan have not been accompanied by ex ante fiscal assessment or by a systematic account of implementation risk grounded in documented failures of comparable reforms elsewhere (Kerbrat & Descatha, 2018; Endicott, 2025; MacEachen et al., 2012), without which they cannot be evaluated as policy.

3. Research methods

The study employs a qualitative comparative design combining comparative institutional and legal analysis of primary sources, directed content analysis, and descriptive statistical analysis of

Kazakhstan's administrative data. The unit of comparison is the national system of social guarantees for work in hazardous conditions. Countries were selected purposively using a comparative design combining within-block similarity with between-block variation, which excluded Tajikistan, Turkmenistan, and Azerbaijan from the CIS block and Japan, Korea, and Australia from the OECD block (Table 1).

Table 1. Country selection: criteria and rationale.

Block	Countries	Selection criteria	Rationale
CIS (n = 6)	Kazakhstan, Russia, Belarus, Uzbekistan, Kyrgyzstan, Armenia	Shared inheritance from Decree No. 298/P-22 (1974); retention of a statutory list or attestation; full-text legislation available	Within-block variation in reform trajectory (Russia: SAWC 2014; Uzbekistan: LC 2022; Kyrgyzstan: LC 2025), institutional starting point held constant
OECD (n = 5)	USA, Germany, United Kingdom, France, Canada	Statutory duty of employer risk assessment; mandatory injury insurance; both regulatory sub-types represented; full-text legislation available	Maximum variation in the preventive-insurance design space: liberal/common-law (USA, UK, Canada) and continental/social-insurance (Germany, France)

Note. compiled by the authors.

Five indicators are computed from Form 1-T for the reference years 2021–2025, plus one auxiliary correction.

Provision ratio measures the share of the reported workforce at surveyed enterprises that receives at least one social guarantee in year t . Provision ratio is calculated using equation (1):

$$H_t = \frac{N_{\text{guar},t}}{L_t} \times 100\% \quad (1)$$

where:

H_t – provision ratio (per cent);

$N_{\text{guar},t}$ – number of workers receiving at least one guarantee in year t (persons);

L_t – reported workforce at surveyed enterprises in year t (persons).

Cumulative growth rate captures the total change of an indicator $X_{\{i\}}$ over the observation window, expressed as a percentage of the base-year value. Cumulative growth rate is calculated using equation (2):

$$T_i = \left(\frac{X_{i,2025}}{X_{i,2021}} - 1 \right) \times 100\% \quad (2)$$

where:

T_i – cumulative growth rate of indicator i (per cent);

$X_{i,2021}$ – value of indicator i in the base year (2021);

$X_{i,2025}$ – value of indicator i in the terminal year (2025).

The measure is applied uniformly to headcount and expenditure indicators to permit direct comparison of quantitative and financial dynamics.

Expenditure index converts nominal employer expenditure into a fixed-base index with 2021 set equal to 1.00. The expenditure index is calculated using equation (3):

$$I_i = \frac{E_{i,2025}}{E_{i,2021}} \quad (3)$$

where:

I_i – nominal expenditure index of guarantee i (dimensionless, 2021 = 1.00);

$E_{i,2025}$ – aggregate employer expenditure on guarantee i in 2025 (million KZT);

$E_{i,2021}$ – aggregate employer expenditure on guarantee i in 2021 (million KZT).

Read jointly with formula (2), I_i exceeding the corresponding growth in $N_{i,t}$ identifies price-driven rather than coverage-driven expansion of the system.

Expenditure per recipient measures the average cost of one recipient of guarantee i in year t and permits comparison across guarantees of unequal aggregate size. Expenditure per recipient is calculated using equation (4):

$$e_{i,t} = \frac{E_{i,t}}{N_{i,t}} \quad (4)$$

where:

$e_{i,t}$ – average expenditure per recipient of guarantee i in year t (KZT / person);

$E_{i,t}$ – aggregate employer expenditure on guarantee i in year t (million KZT);

$N_{i,t}$ – number of recipients of guarantee i in year t (persons).

A rise in $e_{i,t}$ at unchanged $N_{i,t}$ indicates that the system becomes more expensive per protected worker without extending coverage.

Real expenditure index adjusts the nominal index for consumer-price inflation and permits assessment of the change in employer burden in constant prices (5):

$$I_i^{\text{real}} = \frac{I_i}{\prod_{t=2022}^{2025} (1 + \pi_t)} \quad (5)$$

where:

I_i^{real} – real expenditure index of guarantee i (dimensionless, 2021 = 1.00);

I_i – nominal expenditure index of guarantee i (from formula 3);

π_t – annual rate of consumer price inflation for year t (per cent).

The cumulative deflator for 2021–2025 equals $\prod_{t=2022}^{2025} (1 + \pi_t) = 1.611$; the ratio $\frac{I_i}{1.611}$ therefore reports employer expenditure in prices of 2021.

The evaluation of a differentiated MOPC scale requires two analytical tools. The first establishes the condition under which the aggregate employer burden is invariant to a change from a uniform to a graded contribution rate. The aggregate employer burden under the graded scale equals that under the uniform rate if and only if (6):

$$\sum_{k=3}^5 r_k \cdot w_k = \frac{r_0}{\lambda} \quad (6)$$

where:

r_k – contribution rate at risk grade k (per cent of payroll);

w_k – payroll share of workers at risk grade k (dimensionless);

r_0 – current uniform MOPC rate (per cent of payroll);

λ – coverage-adjustment factor between the List-based population and the risk-assessment population (dimensionless);

k – index of risk grade, $k \in \{3, 4, 5\}$.

Condition (6) is a policy rule with a direct reading: if risk-assessment coverage proves narrower than the List ($\lambda < 1$), fiscal neutrality permits a higher average rate – the same aggregate expenditure redirected to fewer, genuinely exposed workers; if coverage proves broader ($\lambda > 1$), neutrality requires a lower average rate. The condition admits infinitely many solutions; the rate schedule reported in the Results is one calibration, obtained under the assumptions specified there.

The second tool converts the contribution saving from a one-grade reduction of risk into the maximum investment an employer would rationally undertake to achieve that reduction.

The maximum investment $K^{\ast}$ that satisfies the present-value break-even condition is (7):

$$K^{\ast} = \Delta r \cdot W \cdot \frac{1 - (1 + \rho)^{-T}}{\rho} \quad (7)$$

where:

$K^{\ast}$ – maximum investment an employer would rationally undertake to move a workplace down one risk grade, capitalised over horizon T (KZT);

Δr – contribution-rate saving from moving a workplace down one grade (per cent of payroll);

W – annual payroll at the affected workplace (KZT);

T – planning horizon (years);

ρ – annual discount rate (dimensionless).

Formula (7) has a direct policy reading: it quantifies the maximum sum an employer would rationally spend, at the margin, to eliminate a hazard sufficient to move a workplace down one grade. Under the current uniform MOPC rate the incentive is identically zero, so $K^{\ast}$ is the analytical measure of the change in employer behaviour that the graded scale can produce.

Form 1-T reports the number of recipients of each guarantee and aggregate employer expenditure, but not exposure at the individual workplace, so the vertical distribution of exposure among recipients is not observable in the series. The 2025 reference year is the first for which the form additionally reports the workforce classified by measured occupational-risk grade; this single cross-section is used to compare the recipient population against the risk-assessment population. The ex ante calibration relies on assumed payroll distributions across risk grades, since the true distribution is unobservable until a workplace-level risk-assessment census exists.

4. Results

The comparison of eleven countries in Table 3 is summarised sequentially across the three analytical blocks of the framework: the basis of entitlement (criteria C1-C3), the instruments provided (C4-C8), and the incentive and agency arrangements (C9-C11).

In the CIS block the trigger of entitlement (C1) is either an occupational title recorded in a centrally approved list (Kazakhstan, Armenia) or the result of attestation of production facilities or workplaces (Russia, Belarus, Uzbekistan, Kyrgyzstan); the unit of assessment (C2) is correspondingly the occupation or the production facility in Kazakhstan and Armenia, and the workplace in the remaining four CIS states. Grading of entitlement by degree of exposure (C3) is absent in Kazakhstan, present with five hazard classes in Russia and Belarus, and partial in

Uzbekistan, Kyrgyzstan and Armenia. In the OECD block the trigger is exposure measured against a national exposure limit (PEL in the USA, AGW in Germany, WEL in the United Kingdom, VLEP in France) or a documented workplace risk assessment (Germany, United Kingdom, France, Canada); the unit of assessment is the workplace, and in France additionally the individual worker under the Compte professionnel de prévention (C2P); grading is continuous in all five OECD countries, with an additional points scale under the French C2P.

Table 3 provides a systematic comparison of the eleven countries across all criteria included in the analytical framework.

Table 3. Cross-country comparison of social guarantee systems for hazardous working conditions.

Criterion	Kazakhstan	Russia	Belarus	Uzbekistan	Kyrgyzstan	Armenia
C1 Trigger of entitlement	Occupational title in List (Order No. 1053) + attestation	Result of SAWC	Attestation result	Attestation of workplaces (Art. 474 LC RUz)	Attestation	Government lists
C2 Unit of assessment	Production facility	Workplace	Workplace	Workplace	Workplace	Occupation
C3 Grading by degree	Absent	Present (classes 3.1-4)	Present (5 grades)	Partial	Partial	Partial (2 grades)
C4 Reduced working time	≤ 36 h; not graded	≤ 36 h; classes 3.3-4; convertible	≤ 35 h; 236 occupations	≤ 36 h; by agreement	≤ 36 h	≤ 36 h
C5 Additional paid leave	≥ 6 days; not graded	≥ 7 days; from class 3.2	4-28 days; 5-tier grading	Set by the Cabinet of Ministers (Art. 481)	6-36 days; graded	Added to the statutory 20/24-day minimum
C6 Increased wages	No statutory minimum	≥ 4 % of tariff rate (Art. 147)	0.10-0.31 %/hour; 5-tier grading	≥ 4 % of tariff rate (Art. 482)	≥ 15 % / ≥ 30 %	≥ 30 % / ≥ 50 % (Art. 183)
C7 In-kind provision	Milk 0.5 l/shift; TPN	Present; substitutable	Present	Present	Present; milk 0.5 l/shift	Absent - not provided in LC RA
C8 Occupational pension	MOPC 5 %, uniform	2-8 % by SAWC class	4-9 % of earnings	Early pension by lists	Early pension by lists	Early pension by lists
C9 Mandatory risk assessment	Required (Order No. 363) but not linked to guarantees	Required; linked to SAWC	Required	Required	Required	Required
C10 Experience-rated insurance	Absent	Partial (contributions differentiated by class)	Partial	Absent	Absent	Absent
C11 Worker participation	Know / limited / limited	Know / yes / yes	Know / limited / limited	Know / limited / limited	Know / limited / limited	Know / limited / limited

Note: compiled by the authors.

Time-based and pay-based instruments (C4, C5, C6) are concentrated in the CIS block. Reduced working time is set at 35-36 hours per week across all six CIS states. Additional paid leave varies from a minimum of six calendar days in Kazakhstan to a graded range of 4-28 days in Belarus. Increased wages are governed by a statutory minimum in five of six CIS states (4 per cent of the

tariff rate in Russia and Uzbekistan; 0.10-0.31 per cent per hour worked in Belarus; 15-30 per cent in Kyrgyzstan; 30-50 per cent in Armenia); Kazakhstan sets no statutory minimum. In-kind provision (C7) - milk or therapeutic-preventive nutrition - is retained in five CIS states and abolished in Armenia. Occupational pension arrangements (C8) take the form of an early pension by lists (Uzbekistan, Kyrgyzstan, Armenia), of contributions graded by exposure (2-8 per cent in Russia, 4-9 per cent in Belarus), or of uniform mandatory occupational pension contributions of 5 per cent regardless of degree (Kazakhstan). In the OECD block, time-based and in-kind instruments (C4, C5, C7) are absent by design; hazard-related pay supplements (C6) are limited to the public sector (USA, Germany) or replaced by a personalised points account (France, C2P); occupational pension effects (C8) operate only through the French C2P, delivering up to two years of early retirement.

Mandatory employer risk assessment (C9) is required in all eleven countries; however, it is linked to the entitlements in every OECD country and in Russia (through SAWC), while in Kazakhstan the assessment established by Order No. 363 is not connected to any of the five statutory guarantees. Experience-rated insurance (C10) - the principal economic incentive for the employer - is fully developed in every OECD country (workers' compensation in the USA and Canada, the sectoral Berufsgenossenschaften in Germany, cotisation AT/MP in France, IIDB in the United Kingdom), partially implemented in Russia (differentiated contributions by hazard class) and Belarus, and absent in Kazakhstan, Uzbekistan, Kyrgyzstan and Armenia. Worker participation rights (C11) - to know, to participate, to refuse dangerous work - are established in full in every OECD country and in Russia; in the remaining CIS states participation rights are recorded as limited (Table 3, C11).

The dynamics of coverage and employer expenditure in Kazakhstan over 2021-2025 are reported in Table 4.

Table 4. Dynamics of social guarantee coverage and employer expenditure for workers in hazardous working conditions in Kazakhstan for 2021–2025.

Nº	Indicator	Unit	2021	2022	2023	2024	2025	Change 2025/2021
1	Reported workforce, surveyed enterprises	persons	1 641 593	1 671 149	1 692 214	1 719 268	1 759 828	+7.20 %
2	Workers receiving at least one guarantee	persons	681 892	680 160	697 301	679 111	681 968	+0.01 %
3	Provision ratio (row 2 / row 1)	%	41.54	40.70	41.21	39.50	38.75	–2.79 p.p.
4	- of which: increased wage rate	persons	390 126	404 261	419 427	333 537	338 237	–13.30 %
5	- of which: additional paid leave	persons	528 871	531 885	543 471	550 738	559 145	+5.72 %
6	- of which: reduced working time	persons	46 513	47 867	45 833	46 985	47 501	+2.12 %
7	- of which: therapeutic-	persons	86 231	88 629	97 762	95 732	96 990	+12.48 %

8	preventive nutrition - of which: milk or equivalent products	persons	319 680	321 891	323 820	331 516	325 429	+1.80 %
9	- of which: right to special state benefit	persons	-	-	-	8 286	9 831	from 2024
10	Employer expenditure on guarantees, total	mln KZT	167 876.4	207 631.8	255 182.6	297 422.3	341 916.4	× 2.04
11	- of which: increased wage rate	mln KZT	67 619.5	79 833.3	98 460.8	95 901.9	105 325.2	× 1.56
12	- of which: additional paid leave	mln KZT	55 592.9	70 307.5	86 276.2	102 687.8	115 535.1	× 2.08
13	- of which: reduced working time	mln KZT	12 908.4	16 878.6	19 521.0	30 928.7	32 289.6	× 2.50
14	- of which: therapeutic-preventive nutrition	mln KZT	21 348.2	29 228.4	37 148.6	38 708.3	42 871.1	× 2.01
15	- of which: milk or equivalent products	mln KZT	8 701.2	10 295.3	12 140.2	13 367.5	14 911.0	× 1.71
16	- of which: items not separately itemised	mln KZT	1 706.2	1 088.7	1 635.8	15 828.1	30 984.4	× 18.16
17	Expenditure per recipient (row 10 / row 2)	KZT	246 192	305 269	365 958	437 958	501 367	× 2.04
18	Nominal expenditure index (row 10)	2021 = 1.00	1.00	1.24	1.52	1.77	2.04	+104 %
19	Real expenditure index (row 10, deflated)	2021 = 1.00	1.00	1.03	1.15	1.24	1.26	+26.4 %

Note: compiled by the authors.

Descriptive results computed by formulas (1)-(5) are as follows. The number of workers receiving at least one guarantee changed from 681,892 in 2021 to 681,968 in 2025 (+0.01 per cent), while the reported workforce at surveyed enterprises grew by 7.20 per cent; the provision ratio H_t (formula 1) therefore declined from 41.54 per cent in 2021 to 38.75 per cent in 2025, a fall of 2.79 percentage points. Aggregate employer expenditure rose from 167,876.4 to 341,916.4 million KZT - a nominal expenditure index $I = 2.04$ (formula 3), corresponding to a cumulative growth rate $T = +104$ per cent (formula 2); the real expenditure index $I^{\text{real}} = 1.26$ (formula 5) indicates a rise of 26.4 per cent in constant prices of 2021. Expenditure per recipient $e_{\{i,t\}}$ (formula 4) rose from 246,192 to 501,367 KZT, a cumulative growth rate of +103.6 per cent. Across guarantee types the number of recipients moved in different directions: the recipients of the increased wage rate fell by 13.30 per cent (with the change concentrated in 2024), while recipients of therapeutic-preventive nutrition, additional paid leave, reduced working time and milk grew by 12.48, 5.72, 2.12 and 1.80 per cent respectively. The expenditure indices by guarantee type ranged from $I = 1.56$ for the

increased wage rate to $I = 2.50$ for reduced working time, with items not separately itemised increasing 18.16-fold following the introduction of the special social payment in 2024.

The 2025 reference year is the first in which the statistical form separates the workforce by measured occupational-risk grade, following the revision of the reporting instrument (Order No. 34, as amended 24 June 2024). The resulting cross-section, together with the count of guarantee recipients on the List/title basis, is presented in Table 5.

Table 5. Workforce by measured occupational-risk grade against guarantee recipients in 2025

Indicator	Persons	Share
Actual number employed in harmful conditions (risk-assessment basis)	396,507	100.0 %
- low occupational risk	227,123	57.3 %
- medium occupational risk	135,534	34.2 %
- high occupational risk	28,505	7.2 %
- very high occupational risk	5,345	1.3 %
Recipients of at least one guarantee (List/title basis)	681,968	-
Difference between recipients and exposed population (lower bound)	$\geq 167,148$	-

Note: compiled by the authors.

Table 5 juxtaposes two counts published in the same statistical form for 2025: the number of workers assessed as employed in harmful conditions on the basis of occupational risk assessment (396,507 persons) and the number of recipients of at least one social guarantee (681,968 persons). The former is distributed across four risk grades: low - 227,123 (57.3 per cent), medium - 135,534 (34.2 per cent), high - 28,505 (7.2 per cent), and very high - 5,345 (1.3 per cent). The arithmetic difference between the two counts equals 285,461 persons. When the 118,313-person payroll-versus-actual counting difference for 2025 is netted out, a lower-bound residual of 167,148 persons remains between the two counts. The interpretation of this residual is limited by the fact that the two counts are drawn from different sections of Form 1-T and rest on different units of observation - a limitation noted with the source. Within the risk-assessment population, workers assessed at the low and medium grades account for 91.5 per cent (362,657 persons), while workers at the high and very high grades account for 8.5 per cent (33,850 persons); the form does not permit the breakdown of guarantee recipients by these grades. Extension of the comparison to earlier years is not possible: for 2021-2024 the form recorded either total employment at surveyed enterprises or a breakdown by individual factor with multiple counting, so no comparable series exists for the exposed population, and row 1 of Table 4 accordingly retains total surveyed employment.

5. Discussion

The CIS list-based model is not merely an administratively dated arrangement: it is a statutory enactment of the compensating-wage-differential mechanism, in which the state performs the function the market is assumed to perform, pricing risk acceptance and obliging the employer to pay. The empirical standing of that mechanism is contested - the premium is fragile and, where present, captured by workers who already hold bargaining power (Dorman & Hagstrom, 1998; Dorman & Boden, 2021) - and if the market does not reliably price risk, there is no ground to expect that legislating it will. Table 4 is consistent with that expectation and sharper than it: the price rose (nominal expenditure $\times 2.04$, real +26.4 per cent) while the number of protected workers did not move at all.

The list-based model adds a defect the market mechanism does not have. In a hedonic market the premium attaches, however imperfectly, to the risk; under the List it attaches to a name. Two workers at identical exposure are protected unequally whenever only one title is listed. Horizontal inequity is therefore not a side effect of an otherwise sound design but a direct consequence of choosing the occupational title as the allocative rule - a defect neither the hazard-pay nor the social protection literature describes. Framed in terms of job quality (Eurofound, 2026), the compensatory model operates on the earnings dimension alone and leaves the physical environment untouched; worse, by attaching income to a hazardous post it raises the worker's private cost of leaving it while leaving the employer's cost of eliminating the hazard unchanged. The system pays workers to remain exposed. The preventive-insurance model inverts the incentive: it makes exposure expensive to the party that controls it.

Five design features of the current allocative rule follow from the empirical picture set out in the Results and from the comparative matrix in Table 3. First, entitlement follows the occupational title, so two workers under identical exposure at the same enterprise may be treated differently - the horizontal inequity discussed above. Second, attestation is conducted once every five years at the facility level, so the volume of every guarantee is invariant to the severity of exposure. Third, MOPC is uniform at 5 per cent regardless of the assessed hazard class (Table 3, C10), so the employer's marginal cost of maintaining a hazardous workplace does not rise with the hazard. Fourth, Article 105 LC RK sets no minimum supplement; Article 102 omits increased pay although Article 105 establishes it; and Articles 69 and 89 refer to attestation while Order No. 363 requires risk assessment - two parallel instruments without a rule of priority. Fifth, attestation does not extend to occupational stress or the ergonomic risks of digitalisation, whereas OECD risk assessment covers all factors by construction (Table 3, C9). Sectoral wage multipliers (Article 282 LC RK; values 1.1-4.0 across eleven industries, the highest in coal mining) mitigate but do not close the pay gap for the four sectors without an approved coefficient - the agro-industrial complex, transport, tourism and sport, and culture and information - where the supplement may lawfully be nominal.

The dichotomy is not absolute. Russia grades pension contributions from 2 to 8 per cent by assessed class; Belarus grades additional leave by degree of exposure; France's C2P delivers entitlements through a personalised account. Convergence is real and runs in one direction: towards measured exposure as the trigger. Direct transplantation is nevertheless unavailable - Kazakhstan has no sectoral insurance funds comparable to the German Berufsgenossenschaften, assessment capacity is untested at scale, and much labour-protection law in the region is declarative (Imankulova & Dzhusupov, 2018). What is available is selective adoption: grading of leave by exposure (Belarus); a statutory minimum supplement (Russia, Kyrgyzstan, Armenia); grading of contributions by risk (Russia, Belarus, Germany); a personalised account (France); mandatory risk assessment with a control hierarchy (Germany, United Kingdom, Canada); and the right to refuse dangerous work (Canada).

The reform proposed here does not add an instrument; it changes the allocative rule. All five guarantees are severed from the List and attached to the degree of occupational risk determined for the individual workplace under occupational risk assessment (Order No. 363), on the existing five-point scale. Guarantees are conferred from degree 3 onward, and their volume increases with degree. Figure 1 contrasts the two rules.

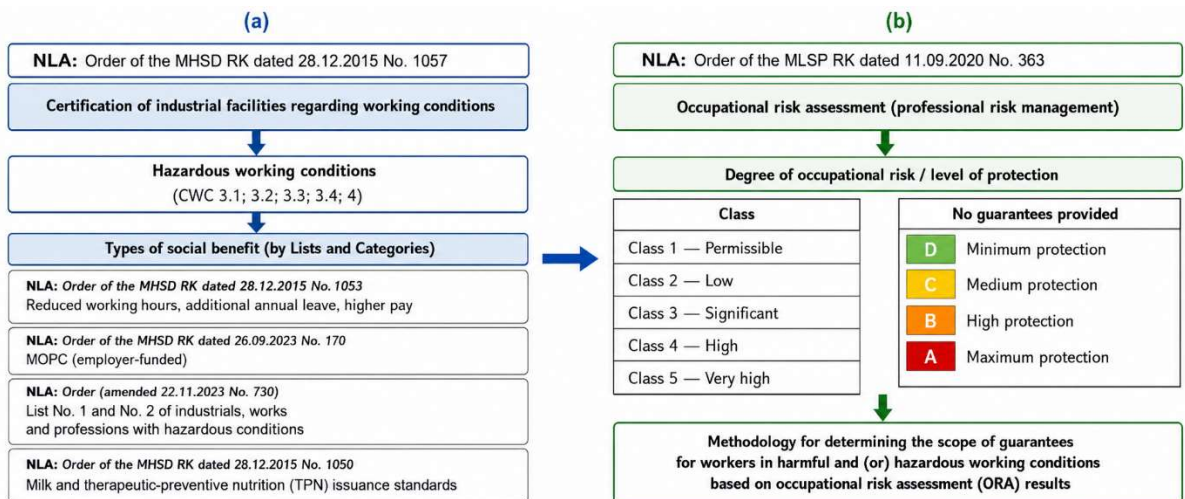


Figure 1. Allocative rule for social guarantees to workers in hazardous working conditions: (a) current list-based rule; (b) proposed risk-based rule.

The comparison presented in Figure 1 shows that the proposed transformation is not additive but substitutive: three currently disconnected regulatory bases - Order No. 1053 (working time, leave and wages), Order No. 170 (MOPC) and Order No. 1930 (Lists Nos. 1 and 2) - are replaced by a single instrument, occupational risk assessment (Order No. 363), that already exists in the national legal system but is legally disconnected from every statutory entitlement. Under the current rule (panel a), the trigger of every guarantee is the occupational title recorded in the List; under the proposed rule (panel b), the trigger is the measured degree of risk at the individual workplace, with the volume of protection rising monotonically from Class 2 (minimum) to Class 5 (maximum) and no entitlement below Class 2. The reform, therefore, does not introduce a new administrative apparatus; it reattaches the five existing guarantees to a legal fact already documented under Order No. 363.

One instrument requires substantive redesign rather than mere regrading. Milk has no established prophylactic efficacy against most harmful chemical agents, and against fat-soluble toxins - dichloroethane, carbon tetrachloride, petrol, organophosphorus compounds - it increases absorption in the gastrointestinal tract, so that its issue is not merely ineffective but contraindicated (Michalski, 2009). No OECD system in the sample issues food products as a hazard measure, and within the CIS block Armenia does not provide milk or therapeutic-preventive nutrition as a distinct guarantee at all (Table 3, C7) - the only post-Soviet system in the sample to have dropped the in-kind instrument, and evidence that its abolition is institutionally feasible without departing from the list-based architecture. Milk should be replaced by specialised beverages with detoxifying properties and by dietary provision differentiated by the pathogenesis of the exposure rather than by occupational title.

The reform is available at unusually low institutional cost, because the instrument already exists: Kazakhstan is the only country in the sample with a mandatory workplace-level risk assessment (Table 3, C9) that is legally disconnected from every entitlement (Table 3, C1). Three disconnected bases - Order No. 1053, Order No. 1057 and Order No. 170 - are replaced by one. Legal fragmentation is resolved not by harmonising three lists but by removing the need for any. The

amendments required to give this effect - 26 items across the Labour Code, the Social Code and five subordinate acts - are set out in Appendix A, Table A1.

The analytical apparatus is set out in Methods (formulas (6) and (7)). Applying condition (6) under the reference payroll distribution $w = (0.50, 0.35, 0.15)$ and coverage-adjustment factor $\lambda = 1$, and imposing an arithmetic progression $r_3, r_3 + d, r_3 + 2d$ on the three degrees at risk yields an effective average rate $\bar{r} = r_3 + 0.65d$. Setting $\bar{r}$ equal to the current uniform rate $r_0 = 5\%$ and choosing a step $d = 3$ percentage points gives $r_3 \approx 3\%$, hence the scale 3/6/9% with $\bar{r} = 4.95\%$. Two design choices are made explicit: the progression is arithmetic, and the step is 3 p.p., which fixes the ratio r_5/r_3 at three. The Russian schedule of additional pension contributions, graded from 2 to 8 per cent by hazard class of special assessment of working conditions, serves as a plausibility check on the range, not as a source of the values. Condition (6) admits infinitely many solutions; the scale reported here is one calibration, and the calibration itself must precede enactment. The three calibrations examined in the ex ante assessment are set out in Table 6.

Table 6. Ex ante assessment of a differentiated MOPC scale (illustrative calibration).

Scenario	$r_3, \%$	$r_4, \%$	$r_5, \%$	Effective average rate $\bar{r}, \%$	Change in aggregate burden	Ratio r_5 / r_3	Employer saving from a one-grade reduction, p.p. of payroll
S0 - status quo (uniform)	5.0	5.0	5.0	5.00	-	1.0	0.0
S1 - moderate progression	3.0	6.0	9.0	4.95	-1.0 % (near-neutral)	3.0	3.0
S2 - strong progression	2.0	6.0	12.0	4.90	-2.0 % (near-neutral)	6.0	4.0-6.0
S3 - revenue-raising	4.0	7.0	12.0	6.25	+25.0 %	3.0	3.0-5.0

Note: compiled by the authors.

Three findings follow. First, progressivity and fiscal neutrality are compatible: a 3–9 per cent scale yields an effective average rate of 4.95 per cent against the current uniform 5 per cent, redistributing the existing burden rather than increasing it. Second, the currently zero incentive becomes quantifiable. Applying the incentive-capitalisation rule (Methods, formula (7)) to the moderate progression S1, with $\Delta r = 0.03$ (a one-grade contribution saving of 3 percentage points), a planning horizon $T = 10$ years and a discount rate $\rho = 0.10$, produces an annuity factor of 6.145 and a capitalised saving $K^* \approx 0.18 \cdot W$. An employer would therefore rationally spend up to approximately 18 per cent of one year's payroll per worker to move a workplace down one risk grade. Under the strong progression S2, with $\Delta r = 0.06$ at the top of the scale, the figure rises to approximately 37 per cent. Under the status quo the incentive is identically zero. EU-OSHA (2019) estimates a return of about €2.20 per €1 invested in occupational safety, so an outlay of this order would be expected to recover its cost independently of the contribution saving that induces it. Third, the result is sensitive to the risk distribution, which is not yet measured. Holding the S1 scale fixed: under a low-risk-skewed distribution $w = (0.70, 0.25, 0.05)$ the effective average rate is 4.05 per cent and the aggregate burden falls 19.0 per cent; under the reference distribution, 4.95 per cent and -1.0 per cent; under a high-risk-skewed distribution $w = (0.30, 0.35, 0.35)$, 6.15 per cent and +23.0 per cent. The fiscal outcome therefore ranges from a 19 per cent reduction to a 23 per cent increase, depending on a parameter only a risk-assessment census can supply. The

conclusion is drawn rather than concealed: calibration must precede enactment, and the rate schedule should be delegated to a subordinate act with an actuarial review clause.

Article 105 LC RK sets no floor, and Kazakhstan is the only CIS state in the sample without a statutory minimum (Table 3, C6). A floor graded by risk would bind only where no sectoral coefficient exists: in coal mining, where coefficients of 1.7-4.0 already apply, the incremental cost is zero, and the burden falls almost entirely on the four sectors with no coefficient - precisely where protection is weakest. A graded floor of 4, 8 and 15 per cent of the tariff rate at degrees 3, 4 and 5 yields, under the reference distribution, an average supplement of 7.05 per cent.

6. Conclusion

Comparing eleven national systems within a single framework yields four conclusions.

First, the two models differ not in the volume of protection but in the allocative rule: the CIS model compensates the worker for occupying a listed post, the OECD model prices exposure for the employer and obliges its reduction.

Second, the list-based model is a statutory enactment of the compensating-wage-differential mechanism, inheriting its contested empirical standing while adding a defect of its own: because entitlement follows the occupational title rather than measured exposure, workers at identical risk are protected unequally. Kazakhstan's data are consistent with the diagnosis - over 2021-2025 employer expenditure doubled in nominal terms and rose 26.4 per cent in real terms, while the number of workers receiving any guarantee did not change.

Third, Kazakhstan already possesses the instrument the reform requires. It is the only country in the sample with a mandatory workplace-level risk assessment (Order No. 363) that is legally disconnected from every entitlement. The reform does not require a new apparatus; it requires connecting one already in law to the entitlements it should govern.

Fourth, the reform is affordable and its incentive effect quantifiable. A graded MOPC scale of 3-9 per cent yields an effective average rate of 4.95 per cent against the current uniform 5 per cent - redistributing the existing burden rather than increasing it - while creating an incentive worth up to 18 per cent of annual payroll per worker to move a workplace down one grade, against zero today. Because the aggregate outcome depends on a payroll distribution that only a risk-assessment census can supply, calibration must precede enactment, and the rate schedule should be delegated to a subordinate act subject to actuarial review.

The transition from a list-based compensatory to a risk-graded principle is thus not primarily a technical modernisation of occupational safety administration. The legislative package giving it effect (Appendix A), the instrument-level comparison on which it rests (Appendix B) and the risks of implementing it (Appendix C) are set out in the appendices. It is a change in the rule by which a society decides who is owed protection - from the name of a person's occupation to the risk that person actually bears.

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Legislative package

The four reform directions - (i) replacing the List with occupational risk assessment as the basis of entitlement; (ii) grading every guarantee by degree of risk; (iii) establishing a statutory minimum wage supplement; (iv) modernising in-kind provision - are given legislative effect through the amendments below. They are placed in an appendix because they are technical instruments of those directions, not findings in themselves.

Table A1. Legislative package: amendments by act and article

Nº	Act / article	Direction	Content of the amendment
1	Art. 69 LC RK	(i)	Replace List No. 1053 with ORA as the basis for reduced working time
2	Art. 69 para. 2 LC RK	(i)	Delete the reference to attestation of production facilities
3	Art. 89 para. 1(1) LC RK	(i)	Replace attestation with ORA as the basis for additional leave
4	Art. 89 para. 1(1) pt. 3 LC RK	(i)	Delete the norm on non-conduct of attestation
5	Art. 89 para. 1(1) pt. 4 LC RK	(i)	Replace attestation with ORA for seconded workers
6	Art. 102 LC RK	(iii)	Add new subpara. 8): increased wages by degree of occupational risk, included among state wage guarantees
7	Art. 103 para. 1 LC RK	(ii)	Add the criterion of the individual degree of occupational risk
8	Art. 105 para. 1 LC RK	(iii)	Establish a graded statutory minimum supplement (4 % at degree 3, 8 % at degree 4, 15 % at degree 5 of the tariff rate)
9	Art. 105 para. 2 LC RK	(i)	Replace the List and attestation with ORA
10	Art. 105 para. 3 LC RK	(i)	Delete the norm
11	Art. 95 para. 4 LC RK	(i)	Adopt ORA as the criterion for the prohibition on recall from leave
12	Art. 127-3 para. 1 LC RK	(ii)	Replace the List with graded entitlement by degree of occupational risk
13	Art. 127-3 para. 4 LC RK	(ii)	Grade the amount of the professional payment by degree of occupational risk
14	Art. 127-3 para. 6 LC RK	(ii)	Extend the authorised body's powers to the grading procedure
15	Art. 182 para. 2(1) LC RK	(i)	Adopt ORA as the single basis for all guarantees
16	Art. 182 para. 2(4) LC RK	(iv)	Replace milk with specialised beverages having detoxifying properties
17	Art. 183 LC RK	(i)	Repeal; substitute an ORA-based norm
18	Art. 16(18) LC RK	(i)	Delete the reference to the List; introduce ORA-based criteria
19	Art. 16(33), (34) LC RK	(iv)	Replace milk with specialised beverages within the authorised body's competence
20	Order No. 1053	(i)	Repeal
21	Order No. 1054	(iv)	Repeal; substitute rules for specialised detoxifying beverages
22	Order No. 1056	(iv)	Revise: differentiate therapeutic-preventive nutrition by pathogenesis of exposure, on the basis of ORA
23	Order No. 1057	(i)	Repeal
24	Order No. 170	(i)	Repeal
25	Order No. 363	(i), (ii)	Extend as the methodological basis for all five guarantees
26	Art. 250 Social Code RK	(ii)	Introduce a graded MOPC rate by degree of occupational risk; delegate the rate schedule to a subordinate act subject to actuarial review (see condition (6))

Instrument-level detail

The tables below report the detailed content of the individual instruments summarised in the unified matrix (Table 3). They are placed in an appendix because they elaborate the matrix rather than add findings to it. All entries reflect the legislation in force as at 1 March 2026.

Table B1. Two typological models of social guarantees

Criterion	List-based compensatory model (CIS)	Preventive-insurance model (OECD)
Allocative logic	Compensating the worker for the fact of employment in hazardous conditions	Eliminating or minimising exposure; insuring against its consequences
Basis of entitlement	Lists of occupations; classes of working conditions established by attestation	Exposure limits; mandatory employer risk assessment
Instruments	Wage supplements, additional leave, reduced hours, occupational pension contributions, milk / TPN	Hierarchy of risk controls, mandatory injury and occupational-disease insurance, medical surveillance, rehabilitation
Financing	Employer (supplements, contributions, in-kind provision)	Employer, in full, through differentiated insurance premiums (bonus-malus)
Employer incentive	Weak: the employer purchases the right to maintain hazardous conditions at a fixed price	Strong: reducing risk reduces the premium
Worker's position	Recipient of an entitlement conferred by occupational title	Participant: rights to know, to participate and to refuse dangerous work
Adaptability to new risks	Low: amending the List is a lengthy administrative procedure	High: risk assessment covers any factor, including psychosocial and ergonomic

Table B2. Reduced working time in CIS countries

Country	Statutory norm	Basis	Grading	Increase to 40 h with compensation	Source
Kazakhstan	≤ 36 h/week	List (Order No. 1053) + attestation	Not graded	No	Art. 69 LC RK
Russia	≤ 36 h/week	SAWC	Classes 3.3, 3.4, 4 only	Yes, with monetary compensation	Art. 92 LC RF
Belarus	≤ 35 h/week	Attestation	236 occupations	No	Art. 113 LC RB
Uzbekistan	≤ 36 h/week	Attestation of workplaces (Art. 474)	Four levels of unfavourable conditions (Art. 473)	By collective agreement	Art. 477 LC RUz
Kyrgyzstan	≤ 36 h/week	Attestation	Arduous / hazardous	No	LC KR
Armenia	≤ 36 h/week	Government lists	Arduous / hazardous / extreme	No	Art. 139 LC RA

Table B3. Additional paid leave in CIS countries

Country	Duration	Basis	Grading	Monetary substitution	Source
Kazakhstan	≥ 6 cal. days	List (8,940 positions)	None	No	Art. 89 LC RK
Russia	≥ 7 cal. days	SAWC, classes 3.2-4	From class 3.2	Part exceeding 7 days	Art. 117 LC RF

Country	Duration	Basis	Grading	Monetary substitution	Source
Belarus	4-28 cal. days	Attestation (Decree No. 73)	3.1 → 4; 3.2 → 7; 3.3 → 14; 3.4 → 21; 4 → 28	Prohibited	Art. 157 LC RB
Uzbekistan	Minimum set by the Cabinet of Ministers	Attestation (Art. 474) + collective agreement	Not fixed in the Code	Not provided	Art. 481 LC RUz
Kyrgyzstan	6-36 cal. days	Attestation	Hazardous 6-12; extreme 12-36	By agreement	LC KR
Armenia	Added to the statutory minimum (20 working days on a 5-day week; 24 on a 6-day week); duration set by the Government	Government lists	Not fixed in the Code	Not provided	LC RA

Table B4. Increased wages for hazardous conditions in CIS countries

Country	Statutory minimum	Basis	Grading	Source
Kazakhstan	None; sectoral coefficients 1.1-4.0	List + attestation	None	Art. 105 LC RK; sectoral agreements
Russia	≥ 4 % of the tariff rate (in practice 4-12 % for hazardous and 16-24 % for especially hazardous work, by collective agreement)	Not linked to SAWC class	Uniform statutory minimum	Art. 147 LC RF
Belarus	0.10-0.31 % of the tariff rate per hour worked	Attestation	3.1 → 0.10 %; 3.2 → 0.14 %; 3.3 → 0.20 %; 3.4 → 0.25 %; 4 → 0.31 %	Decree No. 575
Uzbekistan	≥ 4 % of the tariff rate; higher rates by agreement with the trade union	Attestation (Art. 474)	Not graded in the Code	Art. 482 LC RUz
Kyrgyzstan	≥ 15 % (hazardous) / ≥ 30 % (extreme) of salary	Attestation	Two grades	Decree No. 258
Armenia	≥ 30 % / ≥ 50 % of salary	Government lists	Two grades	Art. 183 LC RA

Table B5. Risk assessment and control mechanisms in OECD countries

Parameter	USA	Germany	United Kingdom	France
Duty of assessment	General Duty Clause (OSH Act, 1970); methodology not federally prescribed	§ 5 ArbSchG: documented assessment, updated on change	Reg. 3 MHSWR: suitable and sufficient assessment, HSE-monitored	DUERP, updated annually
Hierarchy of controls	Five-tier hierarchy: elimination → substitution → engineering → administrative → PPE	STOP principle (§ 4 ArbSchG): substitution → engineering → organisational → PPE	So far as is reasonably practicable; collective protection prioritised	Nine general principles of prevention, including avoidance of risk at source
Exposure limits	Mandatory PEL	Mandatory AGW	Mandatory WEL	Mandatory VLEP

Parameter	USA	Germany	United Kingdom	France
Medical surveillance	Mandatory for specified substances; employer-funded	Three tiers under ArbMedVV	Mandatory for noise, vibration, asbestos, lead; employer-funded	Occupational health service; enhanced monitoring for at-risk workers
Hazard supplement	Federal employees only: 4 %, 8 % or 25 % of pay (5 CFR 550); private sector unregulated	Public sector only: Erschwerniszulagen 5-18 % (EZulV); private sector by collective agreement	Not statutory	Not statutory; C2P points instead (4 or 8 points per year; 1 point = €500)

Table B6. Mandatory employment-injury insurance in OECD countries

Parameter	USA	Germany	United Kingdom	France
System	Workers' Compensation (by state)	DGUV through Berufsgenossenschaften	Industrial Injuries Disablement Benefit + civil claims	Branche AT/MP
Financing	100 % employer; premiums by industry and loss ratio	100 % employer; approximately 80 risk-graded tariff levels across the sectoral funds	National Insurance	100 % employer; differentiated cotisation AT/MP
Wage replacement	≈ 66.7 % of average wage	80 % of gross earnings	Fixed rates by degree of impairment	60 % from day 1; 80 % after day 29
Disability pension	Permanent benefits for lasting impairment	Pension for impairment ≥ 20 %	Benefit for impairment ≥ 14 %	Pension for lasting incapacity
Rehabilitation	Medical and vocational	Full medical, retraining, dependant payments	National Health Service and employment support	Occupational health and regional insurance funds

Implementation risk register

Table C1. Implementation risk register

Nº	Risk	Nature	Evidential basis	Mitigation
1	Under-declaration: employers depress the risk grade to lower contributions	Behavioural	Claims management in preference to hazard reduction (Thomason & Pozzebon, 2002; Lengagne, 2016)	Independent accreditation of assessment providers; bar on selling remediation to the same client; state re-assessment audit of a random subsample; right of worker and union to contest; liability for misdeclaration
2	Attrition of hard-to-measure factors: assessment narrows to the cheapest to assess	Methodological	France removed four of ten C2P factors in 2017 for assessment complexity (Ordinance No. 2017-1389)	Retain all factors by statute; phase in difficult factors with sector-specific reference methodologies; prohibit narrowing by subordinate act
3	Loss of vested entitlements by listed workers whose measured risk is below degree 3	Social	The over-inclusion rate is unknown but non-zero	Grandfathering for workers in post at entry into force; transitional compensation on reassignment
4	Administrative capacity: replacing an 8,940-position List with workplace-level assessment	Administrative	Attestation is conducted once in five years at facility level, not annually at workplace level	Phased rollout by economic activity section, highest-hazard first; integration with the state occupational safety information system; risk-based inspection
5	Fiscal uncertainty: aggregate burden may fall 19 % or rise 23 %	Financial	Sensitivity analysis above	Calibrate on a risk-assessment census before enactment; delegate the schedule to a subordinate act with an actuarial review clause
6	Workers outside the formal employment relationship remain uncovered	Structural	Coverage gaps concentrated in informal employment (ILO, 2024)	A boundary of the reform; requires a complementary formalisation policy
7	Weak enforcement renders the new rule as declarative as the old	Institutional	Much labour-protection law in the region is declarative (Imankulova & Dzhusupov, 2018)	Sanctions tied to assessment integrity rather than paperwork; publication of enterprise-level risk grades; strengthen the right to refuse dangerous work

Note. Compiled by the authors

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