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Regional Differences in Social Protection in Kazakhstan: The Role of Payment Levels and Coverage

Saltanat S. Rakymzhanova[1]* | Parida B. Issakhova[2] | Nadiya M. Sabitova[3]

[1]Kazakh Ablai Khan University of International Relations and World Languages, Almaty, Kazakhstan.

[2]Almaty Management University, Almaty, Kazakhstan.

[3]Kazan Federal University, Kazan, Russia.

Correspondence
*Saltanat S. Rakymzhanova – Master of Economic Sciences, Senior Lecturer, Kazakh Ablai Khan University of International Relations and World Languages, Almaty, Kazakhstan. Email: rss1972@mail.ru

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Abstract
Regional differentiation of social protection remains one of the key problems of ensuring balanced socio-economic development and reducing inequality. The aim of the study is to assess inter-regional differences in the level of social protection in Kazakhstan and to determine the contribution of the level of payments and coverage of the population to the formation of these differences. The empirical base consists of official data from the Bureau of National Statistics of the Republic of Kazakhstan for the period 2014–2024, covering 17 regions. The research methodology includes the standardization of indicators (Z-score), their time averaging, the construction of an integral index of social protection, cluster analysis with the determination of the optimal number of clusters based on Gap Statistical, as well as multidimensional scaling using Euclidean metrics. The results showed the presence of stable regional differentiation: the values of the integral index range from –0,68 in the North Kazakhstan region to 0,95 in the Turkestan region. High values were also recorded in the East Kazakhstan region (0,72) and Almaty (0,69). Cluster analysis revealed five groups of regions that differ in the combination of payment levels and coverage, which confirms the heterogeneity of the functioning of the social protection system. The results show that an increase in payments has a more significant impact on the level of social protection than an expansion of coverage with a low level of funding, which should be taken into account when shaping regional social policy.

KEYWORDS
Economy, Regional Economy, Regional Differentiation, Economic Efficiency, Social Policy, Public Expenditure, Income Distribution, Cluster Analysis

1 | INTRODUCTION

Social protection determines the standard of living and reduces the risk of poverty among vulnerable groups by ensuring basic income and reducing social tension. Therefore, social protection is fundamental to societal resilience and helps reduce the gap between different population groups. When sufficiently developed, it creates the conditions for the transition from meeting basic needs to a more sustainable level of well-being.

Social protection creates conditions for people to make economic decisions without the risk of total impoverishment (Norton et al., 2002). The state plays a redistributive role and supports basic living conditions. Social protection ensures a minimum standard of living that the market alone cannot guarantee. People face income loss, illness, and crises, and without a safety net, such shocks lead to a sharp decline in living standards. Most importantly, people maintain access to education and healthcare and remain economically active even during difficult periods.

Cash payments are an important tool of social protection because people often lack a stable income and, without direct financial assistance, cannot cover even basic needs (Slater, 2011). However, questions arise about how to organise payments and who should receive assistance. Paying everyone requires significant expenditure, especially if it is only for those in need; accurately identifying recipients is difficult, leaving some people without support. There is also the issue of conditions: additional requirements can improve outcomes, but they require monitoring resources, which not all countries have. With limited budgets, it is impossible to ensure broad coverage and high accuracy simultaneously.

In many low- and middle-income countries, a significant proportion of people either do not receive support at all or have limited access to it. It is the most vulnerable groups that often fall outside the system. For example, in countries such as Nigeria and Laos, coverage remains extremely low, whereas in Namibia and Botswana it is significantly higher (Schmitt, 2020). Coverage depends directly on the type of program: contributory systems cover only those employed in the formal sector. In contrast, programs without contributory requirements include a much wider range of the population. In settings with high levels of informal employment, this factor becomes crucial, as a significant portion of the population lacks access to insurance mechanisms (Kasteng et al., 2015).

The social protection system in Kazakhstan supports the population and plays a crucial role during economic change and crisis. However, funding in Kazakhstan is lower than in developed countries, and the system is primarily targeted at specific groups of the population who are directly included: pensioners, people with disabilities, large families, the unemployed, and children without parental care. Resources are targeted at those considered the most vulnerable. However, a significant portion of the population with unstable or low incomes may remain outside the system if they do not meet the established criteria. The size of payments is weakly linked to income and wage levels (Tuzubekova et al., 2022). In some cases, social benefits are close to the wages of low-paid workers. In some situations, payments even exceed wages. As a result, the difference between income from work and social support becomes small. At the same time, benefit amounts can vary significantly among individuals with similar labour contributions but different retirement dates or different accrual conditions. Therefore, the level of support is weakly linked to an individual's economic participation. As a result, the social protection system works, but its impact on living standards and income distribution remains limited.

Given the existing differences in the social protection system and the limited impact of payments on living standards, it is important to examine how these differences are formed at the regional level and the role that payment size and population coverage play in this.

The purpose of this study is to assess regional differences in the level of social protection in Kazakhstan and to determine how payment levels and population coverage shape these differences.

2 | LITERATURE REVIEW

The size of social transfers indicates the extent to which government transfers can cover basic household expenses and reduce current vulnerability. Existing studies view transfers as a tool for rapid poverty reduction and consumption growth. According to Fiszbein et al. (2009), cash transfers yield the most significant results when they simultaneously raise households' incomes and encourage them to invest in their children's health and education. Immervoll and Richardson (2011), using OECD countries as an example, showed that even with increased redistribution, market inequality often increases faster than it is reduced. Moreover, social transfers have a stronger impact on reducing inequality than tax instruments. However, Atkinson (2015) showed that the current redistribution system is insufficient and proposed strengthening it through three approaches: increasing child benefits, more progressive taxes, and expanding social support. However, Bastagli et al. (2016) found that low and irregular transfer amounts do not lead to sustainable improvements in living standards. While increased transfers boost consumption, sustainable poverty reduction depends on the size and regularity of transfers, as well as the delivery mechanism. Using African countries as an example, Devereux (2021) showed that during the COVID-19 pandemic, governments most often used two quick fixes: temporarily increasing transfers to existing recipients and expanding the coverage of existing programs. However, a high or increased transfer within an existing program does not guarantee that support will reach everyone who has actually experienced a shock. Thus, in a crisis, even a rapid increase in transfers within existing schemes does not address the problem of new at-risk groups. Therefore, examining the size of social transfers without accounting for who is actually included in the system provides only a partial picture.

Population size determines the proportion of vulnerable groups included in the support system. High payments do not contribute to poverty reduction if the coverage is insufficient. At the same time, expanding coverage without regard to targeting reduces the efficiency of resource allocation. Hanlon (2004) and Barrientos (2016) argued that to combat poverty, a broader population should be included. However, this approach reduces the accuracy of fund distribution, and a significant number of people with more stable incomes are included in the system alongside those experiencing poverty. Therefore, Levy (2009) demonstrated that program targeting can lead to a significant portion of assistance nonetheless reaching target groups. Using the PROGRESA program in Mexico as an example, the author demonstrated that even with precise selection, some people in need remain outside the system because they do not meet the formal criteria. Thus, even with a well-tuned selection system, it is impossible to reach everyone in poverty. Any selection method introduces errors (Devereux et al., 2017). The level of coverage depends on the strictness of the selection criteria. Soft criteria allow more people to be included, but reduce precision. Strict criteria increase precision but reduce the number of beneficiaries. Thus, an increase in the number of beneficiaries does not in itself mean an improvement in the outcome. Even with limited coverage, the system reduces inequality if assistance is targeted to the most vulnerable groups (Niño-Zarazúa, 2019).

The effectiveness of social protection depends on how payment levels and the range of recipients are aligned, as misalignment prevents programs from reducing poverty. Koehler (2011), using transfer programs in South Asian countries as an example, showed that al-

though these programs cover a significant portion of the population, their size remains small (Hanna & Olken, 2018). As a result, households use these funds to cover basic needs and food expenses. However, households are unable to accumulate resources or change their source of income. Consequently, with high coverage, small payments entrench the current situation of recipients and do not change it. However, Barrett and Carter (2013) noted that a household must receive an amount sufficient to move to another level, for example, to invest in production or education. Therefore, the authors argued that it is necessary to establish a payment threshold beyond which income changes. However, the conclusions of Koehler (2011) and Barrett and Carter (2013) that coverage is crucial remain controversial. Gugushvili and Laenen (2021) reached the opposite conclusion: a high level of payments is inefficient, and wider coverage allows for greater redistribution even with moderate payments. Therefore, external factors affect the system, including periods of economic growth or crisis (Wlezien & Soroka, 2021; Busemeyer, 2023).

Social protection is often assessed using composite indices. However, literature lacks a unified approach to constructing such indices. As a result, the same data set can yield different conclusions depending on how the index is constructed. Nardo et al. (2005) view composite indices as the result of a sequential procedure in which each decision alters the final result. The authors noted that a composite index can be a useful tool, but if the design is weak, it produces biased results. An index can be disaggregated by population groups and by individual dimensions (Alkire & Foster, 2011). Decancq and Lugo (2013) emphasised the role of weights, noting that the index's problems begin at the stage of assigning relative importance to dimensions. Each weighting system is based on a specific notion of what is considered more important for well-being. Weights determine the permissible trade-offs between dimensions and indicate how much of one component can compensate for the deficiency of another (Mazziotta & Pareto, 2016). Most of the approaches reviewed construct an index either around multidimensional deprivation in a broad sense or around general rules for aggregation and weighting. However, less developed is the approach that specifically builds an integrated assessment of social protection around the internal structure of the assistance system itself, where a single model must simultaneously reflect the level of support provided and the scale of its distribution. Therefore, further research could fill this gap by developing an index that assesses social protection as a ratio of key parameters of the assistance system itself.

Kazakhstani studies of regional development actively use index-based approaches and territorial grouping methods to identify differences among regions and assess their socioeconomic status. Kuanova et al. (2023) used the index method to assess regional sustainable development. They proposed an aggregate SDI indicator based on GRP per capita, unemployment, poverty, food security, crime rate, education, and environmental pollution. The authors sought to obtain a comparative assessment of the regions and identify leaders and laggards through normalisation, weighting, and ranking. The results showed that regions vary significantly in their levels of sustainability, with poverty being the key differentiating factor. However, this approach does not reveal the contribution of individual factors, nor their relative importance in shaping differences between regions. Uskelenova and Nikiforova (2024) applied a qualitative approach and analysed regional development and the actual state of the economy. However, the quantitative analysis did not identify the significance of individual social and economic policy instruments. Aliyeva et al. (2025) analysed the effectiveness of employment policy, reporting a cluster approach. The analysis was focused on regional employment and showed that the same instruments produce different effects across regions.

Existing studies confirm the presence of pronounced regional differentiation in Kazakhstan and demonstrate the use of index and cluster methods to assess it. However, a general gap remains: an analysis of the significance of individual indicators and instruments, including social policy elements, in shaping these differences is lacking. An assessment of which factors have the greatest impact and how they interact is not provided. This study fills this gap by integrating an index approach with subsequent analytical decomposition of indicators and the use of grouping methods, which allows not only to record differences between regions, but also to determine the contribution of key factors, including social policy parameters, to the formation of the observed structure of regional development.

3 | METHODOLOGY

The choice of indicators is based on a literature review. Fiszbein et al. (2009) and Bastagli et al. (2016) noted that the size of transfers determines households' ability to cover basic expenses and reduce current vulnerability, and that they affect sustainable improvements in well-being. Koehler (2011), Barrett and Carter (2013), Barrientos (2016), and Niño-Zarazúa (2019) noted that the number of recipients reflects the degree of population inclusion in the support system and determines the redistributive effect of social policy. Thus, the choice of indicators is based on identifying two key functions of social policy: the volume of payments and population coverage. Accordingly, the analysis includes indicators reflecting both components: the average size of social payments and the volume of targeted social assistance characterise the level of cash transfers, while the number of pensioners and recipients of targeted assistance reflects the scale of population coverage.

The use of these indicators is motivated by their direct reflection of the parameters used to assess social protection quantitatively. The average size of social payments and the volume of targeted social assistance are used to assess the level of financial support and its sufficiency to cover basic expenses, which is considered a key criterion for the effectiveness of transfers (Immervoll & Richardson, 2011; Atkinson, 2015). The number of pensioners and recipients of targeted assistance is used to assess the degree of population coverage and the scale of inclusion in the system, as it determines the distributional effects and the scope of social policy (Devereux et al., 2017; Levy, 2009). Thus, assess social protection through two measurable parameters, the level of payments and the scale of their distribution, enabling a quantitative analysis of regional differences.

Table 1 presents the initial data for the selected indicators for 2014–2024.

Table 1 Social protection indicators

No.	Code	Indicator	Measurement Unit
1	Z_BEN	Average monthly social benefits	tenge
2	Z_PEN	Number of pension beneficiaries	persons
3	Z_ASP_AMT	Average monthly targeted social assistance	tenge
4	Z_ASP_REC	Number of targeted social assistance beneficiaries	persons

Note: compiled by the authors based on Bureau of National Statistics (2025).

The study aims to identify differences between regions in the level of social protection, evaluate the balance between payment amounts and population coverage, and identify groups of regions with similar characteristics. Additionally, the objective is to present the results visually to identify regional differences. The research design is presented in Figure 1.

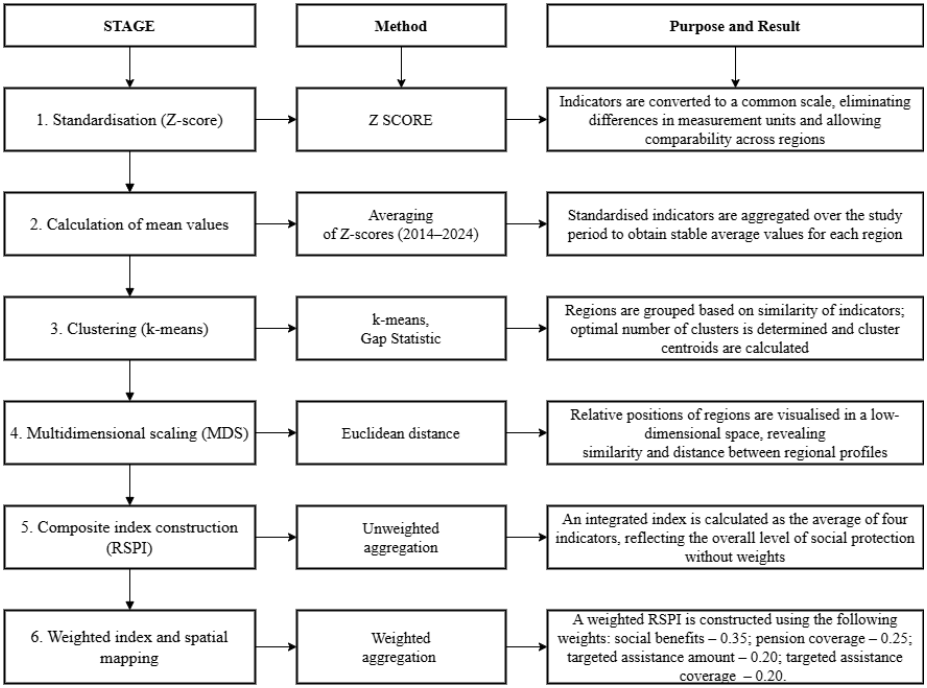


Figure 1 Research design

At the first stage, to achieve the research objectives, the methodology consists of several sequential steps. The initial step involves data preparation through the standardisation of indicators using Z-scores, which ensures comparability by transforming all variables to a common scale. The Z-score is calculated according to formula (1):

$$Z_{it} = \frac{X_{it} - \mu_t}{\sigma_t} \tag{1}$$

where:

X_{it} – the value of one of the social protection indicators for region i in year t, including the amount of social benefits (BEN), the number of pensioners (PEN), the amount of targeted assistance (ASP_AMT), or the number of recipients (ASP_REC);

μ_t – the average value of the corresponding indicator for all year t, calculated separately for each indicator (BEN, PEN, ASP_AMT, ASP_REC);

σ_t – the standard deviation by region in year t for the corresponding indicator, reflecting the degree of variation between regions for each indicator.

At the second stage, the standardised indicators are aggregated over the entire observation period by calculating their average values. This step involves temporal aggregation and the construction of an integrated measure reflecting the overall level of social protection. The calculation is performed according to formula (2):

$$\overline{Z}_i = \frac{1}{T} \sum_{t=1}^{T} Z_{it} \tag{2}$$

where:

$\overline{Z}_i$ – the average standardised value of a given indicator for region i over the entire observation period;

Z_{it} – the standardised value (Z-score) of the indicator for region i in year t;

T – the number of years in the observation period.

At the third stage, a k-means cluster analysis was performed. The optimal number of clusters, k, was determined using the Gap Statistic. The partitioning procedure is based on minimising the within-cluster variance according to formula (3):

$$\sum_{k=1}^{K} \sum_{i \in C_k} \|x_i - \mu_k\|^2 \to \min \tag{3}$$

where:

K – the total number of clusters;

C_k – the set of observations (regions) assigned to cluster k;

x_i – the vector of standardised indicators for region i;

μ_k – the centroid (mean vector) of cluster k.

The centroid is defined as the average value of the indicators within the cluster. At the fourth stage, multidimensional scaling (MDS) was applied to analyse the relative positioning of regions. Distances between regions were calculated using the Euclidean metric according to formula (4):

$$d_{ij} = \sqrt{\sum_{m=1}^{M} (x_{im} - x_{jm})^2} \tag{4}$$

where:

d_{ij} – the Euclidean distance between regions i and j;

x_{im}, x_{jm} – the values of indicator m for regions i and j, respectively;

M – the total number of indicators included in the analysis.

At the fifth stage, an integrated social protection index is constructed. The index values are visualised on a map, enabling the identification of regional differences in social protection levels. The index is calculated as the arithmetic mean of four standardised indicators according to formula (5):

$$\text{RSPI}_i = \frac{Z_{BEN,i} + Z_{PEN,i} + Z_{ASP\_AMT,i} + Z_{ASP\_REC,i}}{4} \tag{5}$$

where:

RSPI_i – the Regional Social Protection Index for region i;

$Z_{BEN,i}$ – the average standardised value of social benefits for region i;

$Z_{PEN,i}$ – the average standardised value of the number of pensioners for region i;

$Z_{ASP\_AMT,i}$ – the average standardised value of targeted social assistance amount for region i;

$Z_{ASP\_REC,i}$ – the average standardised value of the number of targeted social assistance recipients for region i.

The results of the RSPI calculation are visualised using a spatial distribution map, allowing for the identification of regional differences in social protection levels. At the sixth stage, in addition to the base model, an alternative map was constructed in which indicators were aggregated according to their respective weights. For this purpose, each indicator was assigned a weight: benefit amount (Z_{BEN}) – 0.35; pension coverage (Z_{PEN}) – 0.25; targeted

assistance amount (Z_{ASP_AMT}) – 0.20; and targeted assistance coverage (Z_{ASP_REC}) – 0.20. The integrated indicator was calculated as a weighted sum of the standardised values (6):

$$\text{RSPI}_i = 0.35 \times Z_{BEN} + 0.25 \times Z_{PEN} + 0.20 \times Z_{ASP\_AMT} + 0.20 \times Z_{ASP\_REC} \quad (6)$$

This alternative specification allows accounting for the heterogeneous contribution of indicators to the overall assessment and enables testing the robustness of the results with respect to changes in the index structure.

Thus, the proposed methodology is a consistent multi-step approach, including the standardization of indicators, their aggregation, the construction of an integrated index, and the use of cluster analysis and multidimensional scaling methods. The use of Z-normalization ensures comparability across indicators, while time averaging helps offset short-term fluctuations and identify persistent regional differences. The inclusion of spatial visualization complements quantitative analysis and provides visual identification of regional differentiation. Together, the applied methods form a holistic analytical toolkit for assessing the level of social protection and interregional differences.

4 | RESULTS

The results of the Z-score analysis show that some regions have high payment levels, while others have high population coverage, though the two characteristics rarely coincide. The social protection system operates unevenly: either a broad segment of the population receives limited support, or payments are higher, but coverage is lower.

Table 2 presents standardized values of the average monthly amount of state social benefits by region for 2014–2024.

Table 2 Average monthly amount of state social benefits (Z-score)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Akmola	-1,44	-1,41	-1,45	-1,36	-1,52	-1,48	-1,56	-1,57	-1,47	-1,43	-1,31
Aktobe	-0,49	-0,54	-0,25	-0,26	-0,30	-0,18	-0,12	-0,01	0,25	0,33	0,31
Almaty	0,22	0,15	0,23	0,13	-0,03	-0,08	0,00	0,01	0,16	0,17	0,17
Atyrau	0,15	-1,20	0,18	0,23	-0,08	-0,10	-0,05	0,10	-0,31	-0,71	-0,73
West Kazakhstan	-0,49	0,46	-0,30	-0,22	-0,14	-0,07	-0,09	-0,22	-0,51	-0,43	-0,32
Zhambyl	1,16	1,32	1,14	1,04	0,86	0,74	0,66	0,47	0,44	0,50	0,52
Karaganda	-0,08	0,04	-0,33	-0,55	-0,86	-1,03	-1,09	-1,30	-1,00	-1,12	-1,22
Kostanay	-1,57	-1,03	-1,55	-1,45	-1,70	-1,59	-1,61	-1,55	-1,40	-1,47	-1,47
Kyzylorda	1,21	1,00	1,03	0,83	0,42	0,30	0,28	0,21	-0,06	0,24	0,35
Mangistau	1,95	1,73	1,97	1,99	1,51	1,59	1,50	1,48	1,60	1,51	1,33
Pavlodar	-0,69	-0,73	-0,57	-0,59	-0,59	-0,57	-0,44	-0,47	-0,47	-0,46	-0,45
North Kazakhstan	-1,49	-1,86	-1,64	-1,89	-1,62	-1,65	-1,69	-1,68	-1,51	-1,33	-1,34
Turkestan	0,96	0,83	1,01	1,11	0,88	0,97	0,99	0,96	0,93	1,22	1,19
East Kazakhstan	-0,55	-0,15	-0,64	-0,28	0,96	0,99	0,99	0,88	-0,10	-0,17	-0,25
Astana c.	-0,40	-0,30	-0,39	-0,33	-0,11	-0,08	0,02	0,46	0,69	0,59	0,66
Almaty c.	0,57	0,87	0,55	0,50	0,72	0,64	0,59	0,66	0,67	0,55	0,43
Shymkent c.	0,96	0,83	1,01	1,11	1,59	1,61	1,62	1,59	2,09	2,00	2,14

Note: compiled by the authors based on the Bureau of National Statistics (2025).

The overall trend shows stable regional differences. Differences are observed between regions, with some cases recording year-over-year changes in values. Some regions consis-

tently remain below average. These include the Akmola Region, with values ranging from –1.3 to –1.5, and the North Kazakhstan Region, with values ranging from approximately –1.8 to –1.3. Values remain below average throughout the period. In Mangystau, the values consistently range from 1.5 to 2.0, and in Zhambyl, from 0.4 to 1.3; both regions maintain positive values throughout the period. Values consistently exceed the average. Shymkent stands out, with values exceeding 2.0 since 2018, making it the region with the highest values. Additionally, a group of regions with values close to zero (Almaty, Pavlodar, West Kazakhstan) is distinguished, where fluctuations around the average level are observed without a stable deviation in the positive or negative direction, as well as regions where a change in position occurs over time, moving from negative to positive values.

Table 3 presents standardized values of the number of pension recipients by region for the period under review.

Table 3 Regional distribution of pension recipients (Z-score)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Akmola	-0,22	-0,24	-0,26	-0,29	-0,28	-0,31	-0,33	-0,35	-0,23	-0,27	-0,31
Aktobe	-0,64	-0,64	-0,63	-0,63	-0,61	-0,62	-0,62	-0,62	-0,55	-0,55	-0,55
Almaty	1,25	1,29	1,33	1,37	1,61	1,65	1,71	1,75	0,68	0,72	0,76
Atyrau	-1,15	-1,15	-1,15	-1,15	-1,18	-1,19	-1,19	-1,19	-1,31	-1,31	-1,30
West Kazakhstan	-0,64	-0,64	-0,65	-0,66	-0,67	-0,68	-0,69	-0,70	-0,67	-0,68	-0,68
Zhambyl	-0,15	-0,14	-0,14	-0,14	-0,07	-0,07	-0,07	-0,08	0,17	0,18	0,18
Karaganda	1,28	1,25	1,21	1,18	1,32	1,29	1,25	1,23	1,23	1,18	1,11
Kostanay	0,16	0,14	0,11	0,08	0,13	0,10	0,08	0,04	0,28	0,24	0,19
Kyzylorda	-0,94	-0,93	-0,93	-0,93	-0,94	-0,94	-0,94	-0,93	-0,97	-0,96	-0,95
Mangistau	-1,30	-1,29	-1,29	-1,28	-1,31	-1,30	-1,29	-1,29	-1,44	-1,41	-1,39
Pavlodar	-0,16	-0,18	-0,19	-0,22	-0,20	-0,21	-0,24	-0,26	-0,11	-0,14	-0,17
North Kazakhstan	-0,35	-0,37	-0,39	-0,42	-0,42	-0,45	-0,47	-0,51	-0,46	-0,51	-0,56
Turkestan	1,51	1,55	1,59	1,65	0,65	0,69	0,71	0,76	1,35	1,40	1,44
East Kazakhstan	1,73	1,69	1,66	1,63	1,81	1,78	1,75	1,71	0,39	0,27	0,20
Astana c.	-0,91	-0,87	-0,82	-0,75	-0,64	-0,56	-0,49	-0,40	-0,12	0,03	0,20
Almaty c.	1,40	1,42	1,43	1,44	1,64	1,66	1,67	1,68	2,55	2,57	2,58
Shymkent c.	-0,88	-0,88	-0,88	-0,87	-0,86	-0,85	-0,84	-0,83	-0,81	-0,78	-0,75

Note: compiled by the authors based on the Bureau of National Statistics (2025).

The trend has been stable over the years, with values for most regions remaining within similar ranges. The highest values are observed in Almaty city, where the indicator exceeds 2.5, and in the East Kazakhstan, where it ranges from approximately 1.6 to 1.8. These regions have maintained positive value throughout the period. The lowest values are recorded in the Mangystau (from –1.3 to –1.4) and the Atyrau (from –1.1 to –1.3), where values remain consistently negative. An additional group of regions with consistently positive values (Almaty, Karaganda, Turkestan, and East Kazakhstan) stands out, in which indicators exceed the average level throughout the period. A group of regions with values close to zero (Kostanay, Zhambyl, and Pavlodar) exhibits minor fluctuations around the average level without sustained deviations. However, in some regions, a transition from negative to positive values has been observed in recent years.

Table 4 presents standardized values of the amount of targeted social assistance by region.

Table 4 Regional distribution of targeted social assistance amount (Z-score)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Akmola	-0,38	0,21	-0,09	0,13	-1,00	-0,67	-0,91	0,00	0,31	0,11	0,93
Aktobe	0,34	0,33	-0,66	-0,87	-0,73	-0,07	-1,00	-1,07	-0,95	-0,99	-0,23
Almaty	0,74	0,94	1,16	0,82	-0,12	0,13	0,94	0,73	0,58	0,45	-0,53
Atyrau	0,49	0,38	0,28	-0,25	0,17	-1,25	-0,35	-0,79	-1,03	-0,77	0,67
West Kazakhstan	0,41	0,31	0,63	0,95	-0,16	-0,60	-0,61	-0,95	-1,08	-1,50	-1,31
Zhambyl	-0,50	-0,73	-0,33	0,07	-0,86	0,71	-0,96	-1,31	-0,29	-0,15	-0,69
Karaganda	0,11	-0,07	0,07	0,04	-0,14	0,38	-0,39	-0,42	-0,94	-0,68	-0,65
Kostanay	0,43	0,32	0,25	0,37	-0,44	-1,50	-0,41	0,73	0,61	-0,20	0,81
Kyzylorda	-1,14	-1,47	-0,81	0,00	0,08	2,17	-0,25	0,03	-0,12	-0,34	-0,79
Mangistau	0,69	-0,83	0,49	0,56	0,31	0,68	0,47	0,28	0,77	2,02	1,84
Pavlodar	0,46	0,40	0,02	0,24	-0,41	-0,72	-0,27	0,90	1,30	0,87	0,20
North Kazakhstan	-0,40	-0,17	0,17	0,19	-0,70	-1,44	-0,58	-0,48	-0,26	-0,35	0,06
Turkestan	-1,26	0,95	-0,74	-0,31	3,48	-0,43	-1,37	-1,93	-1,49	-1,43	-2,13
East Kazakhstan	1,20	1,16	1,34	1,47	0,21	-0,16	0,67	1,43	1,26	0,78	0,04
Astana c.	-0,50	-0,79	-1,07	-1,27	-0,42	0,99	1,57	1,45	1,73	1,86	1,55
Almaty c.	1,75	1,49	1,76	0,78	0,55	0,62	1,88	1,14	0,75	0,45	0,18
Shymkent c.	-2,41	-2,45	-2,46	-2,92	0,18	1,17	1,58	0,27	-1,16	-0,13	0,06

Note: compiled by the authors based on the Bureau of National Statistics (2025).

Values for targeted social assistance vary significantly year over year and between regions. The highest values are recorded in the Mangistau region (2.0+) and, in some years, up to 2.1 in the Kyzylorda region. In Mangistau, values exceed 2.0 in some years, while in the Kyzylorda region, values increased to 2.17 in 2019. The lowest values are observed in the West Kazakhstan region (from –1.3 to –1.5), while the lowest value is recorded in the Turkestan region (up to –2.13), where values reach minimum levels. There is a significant gap in payment amounts across regions, with differences exceeding 4 standard deviations. Regions with highly variable values (Turkestan, Kyzylorda, Mangistau) are additionally distinguished, while in several regions (Karaganda, Zhambyl), values remain closer to zero without noticeable dynamics.

Table 5 presents standardized values of the number of recipients of targeted assistance.

The overall trend reveals differences between regions; values vary by region and by year. The highest values are observed in the Turkestan region, where the indicator reaches 3.5 and remains above 2.5 for several years. In the Turkestan region, values exceed 3.0 and remain above 2.5 for several years. High values are also recorded in East Kazakhstan region (2.1) at the beginning of the period. In East Kazakhstan region, values reach around 2.0 at the beginning of the period, then decrease. The lowest values are found in the Pavlodar region (from –1.1 to –0.3) and the Akmola region (from –1.1 to –0.6), where values remain negative throughout the period. Regions with changing values (Turkestan, Shymkent) are additionally distinguished, where a transition to positive values is observed. In contrast, in several regions (Akmola, Aktobe, Pavlodar), values remain below average.

Table 5 Regional distribution of targeted social assistance recipients (Z-score)

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Akmola	-0,97	-1,11	-0,96	-0,99	-0,47	-0,58	-0,69	-0,66	-0,60	-0,59	-0,62
Aktobe	-1,41	-1,44	-1,35	-1,28	-0,30	-0,25	-0,36	-0,40	-0,24	-0,26	-0,26
Almaty	0,62	0,99	1,27	1,42	0,55	1,01	0,69	0,83	0,45	0,58	0,59
Atyrau	-0,26	0,40	0,92	0,73	-0,50	-0,61	-0,76	-0,72	-0,72	-0,71	-0,76
West Kazakhstan	0,27	0,43	0,50	0,16	-0,37	-0,48	-0,51	-0,54	-0,50	-0,56	-0,59
Zhambyl	1,28	0,89	0,46	0,24	0,90	0,45	0,25	0,05	0,21	0,30	0,46
Karaganda	1,16	1,28	1,30	1,50	-0,50	-0,46	-0,52	-0,57	-0,60	-0,62	-0,69
Kostanay	-0,07	0,09	0,26	0,22	-0,43	-0,54	-0,54	-0,53	-0,41	-0,41	-0,52
Kyzylorda	-0,27	-0,42	-0,78	-0,91	0,13	0,18	0,23	0,21	0,61	0,49	0,56
Mangistau	0,41	0,00	0,41	0,39	-0,53	-0,51	-0,56	-0,51	-0,40	-0,38	-0,32
Pavlodar	-1,06	-1,13	-1,08	-0,96	-0,59	-0,58	-0,54	-0,52	-0,40	-0,38	-0,32
North Kazakhstan	1,02	0,23	0,21	0,13	-0,55	-0,71	-0,75	-0,69	-0,67	-0,69	-0,75
Turkestan	0,78	1,14	-0,21	-0,31	3,57	3,42	2,88	2,62	3,51	3,52	3,37
East Kazakhstan	1,90	1,89	2,00	2,12	-0,04	-0,21	-0,01	-0,08	-0,51	-0,55	-0,60
Astana c.	-1,00	-0,87	-0,32	-0,06	-0,64	-0,59	-0,51	-0,49	-0,42	-0,39	-0,38
Almaty c.	-1,33	-1,32	-1,28	-1,13	-0,68	-0,45	-0,43	-0,44	-0,30	-0,29	-0,31
Shymkent c.	-1,06	-1,04	-1,34	-1,28	0,44	0,90	2,13	2,44	1,00	0,93	1,12

Note: compiled by the authors based on the Bureau of National Statistics (2025).

Figure 2 presents the results of determining the optimal number of clusters using the Gap Statistic method, where the maximum value indicates the most feasible number of groupings.

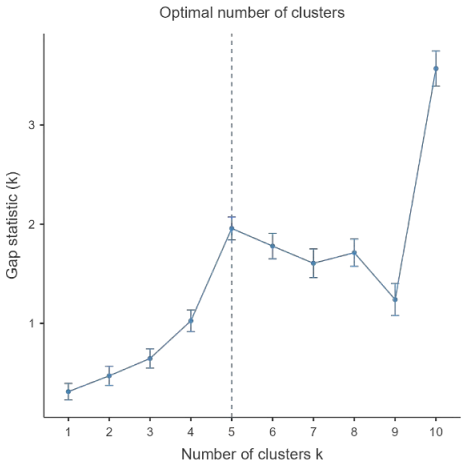


Figure 2 Determining the optimal number of clusters based on Gap Statistic

Based on the K-means analysis, the optimal number of clusters is five. The Gap Statistic

increases, then decreases, as the number of clusters increases. After five clusters, values begin to fluctuate and decline, indicating excessive detail without a significant improvement in clustering quality. Table 6 presents the cluster centroids, reflecting the average indicator values for each group of regions, allowing us to identify differences in payment levels and the scale of social support coverage.

Table 6 Centroids of clusters

No.	Z_BEN_avg	Z_PEN_avg	Z_ASP_AMT_avg	Z_ASP_REC_avg
1	-0.085	37622.000	0.305	-0.300
2	21003.500	-1.070	0.045	0.105
3	1.000	44927.000	-0.970	44228.000
4	-0.425	-0.481	-0.161	-0.317
5	0.125	14429.000	0.580	0.680

Note: compiled by the authors.

Cluster centroids reflect differences between regional groups in terms of payment levels and population coverage, based on standardised indicators. The first cluster is characterised by values close to the average for most indicators, with a slightly positive value of Z_ASP_REC_avg (0.305) and negative values for Z_BEN_avg (–0.085) and Z_ASP_AMT_avg (–0.300), indicating moderate payment levels combined with below-average coverage. The second cluster is characterised by a relatively high value of Z_PEN_avg (–1.070) and values close to zero for other indicators, suggesting average payment levels with limited population coverage. The third cluster demonstrates the highest values across most indicators, with Z_BEN_avg (1.000) and Z_ASP_AMT_avg (–0.970), indicating a combination of high payment levels and relatively strong financial support. The fourth cluster shows negative values for all indicators, reflecting the lowest levels of both payments and coverage. The fifth cluster is characterised by moderately positive values, indicating a balanced combination of relatively higher payments and broader population coverage.

Figure 3 shows the relative positions of regions based on the degree of similarity in social indicator values, with close points indicating similar payment and coverage levels and distant points indicating significant differences.

The multidimensional scaling Plots show the distances between regions based on selected indicators, with proximity indicating similarity in levels of social support and population coverage, and distance indicating differences. Groups located close together are characterised by similar benefit values and recipient numbers, indicating comparable access to social assistance. In such regions, the daily situation for the population appears similar: support levels are predictable, requests for assistance occur regularly, and the burden on the system is evenly distributed. Regions remote from the main group differ in the number of recipients. A significant share of the population depends on social assistance. Due to high volumes, daily issues arise that affect the overall responsiveness of government agencies. There are more requests and longer queues. Moreover, the benefits may not meet demand, and the coverage of basic expenses is limited. In the opposite situation, when population values are low and benefits are higher, assistance is received by a smaller proportion of the population. Still, the amount of support allows for a wider range of needs. There is a more stable standard of living for recipients and less pressure on the system.

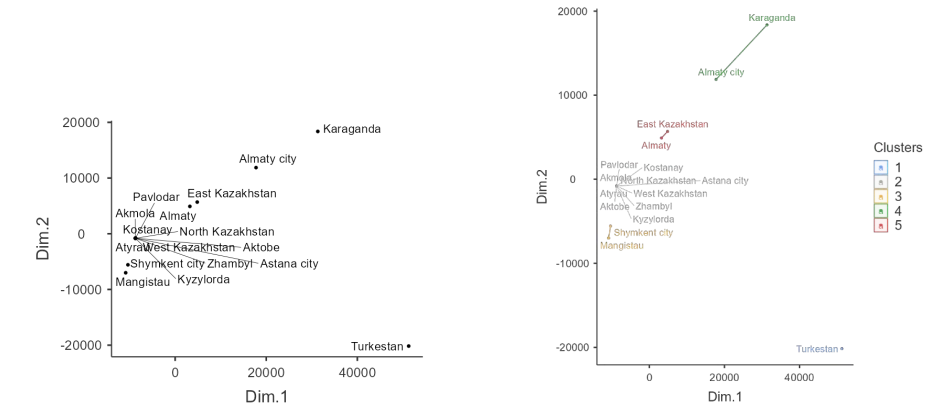


Figure 3 Multidimensional scaling of regions by social protection indicators

Next, a distribution map of social protection levels across regions was constructed from the aggregated index. The results revealed the following. First, regions with higher integrated levels of social support, as indicated by positive index values, were identified. Stable coverage of basic expenses and more accessible access to assistance. Second, areas with lower index levels are observed, with negative values indicating either below-average payments or limited coverage. Some households receive less support or face limited access to programs. Third, the map reveals unevenness between regions. Eligibility for social assistance depends not only on income but also on location, as regions with below-average values may be located nearby.

Figure 4 shows the distribution of the integrated social protection index by region, calculated from the average values of four indicators to assess differences in payment levels and social support coverage.

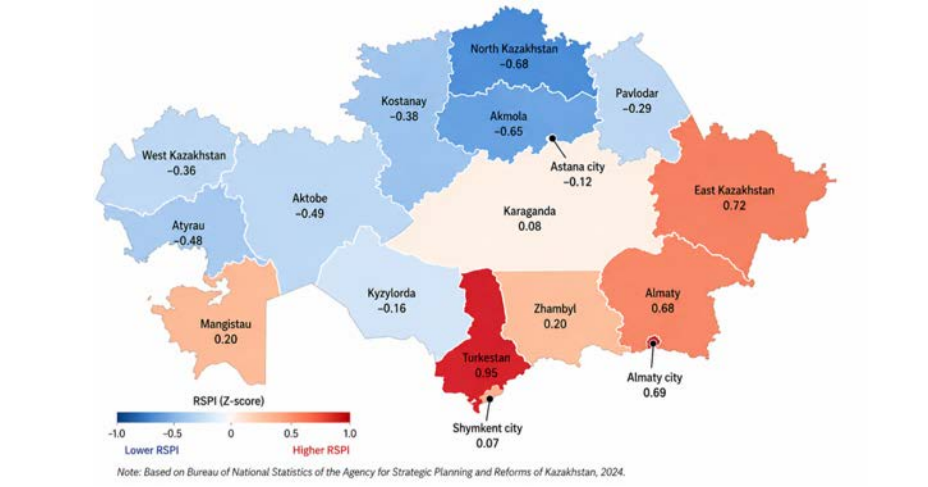


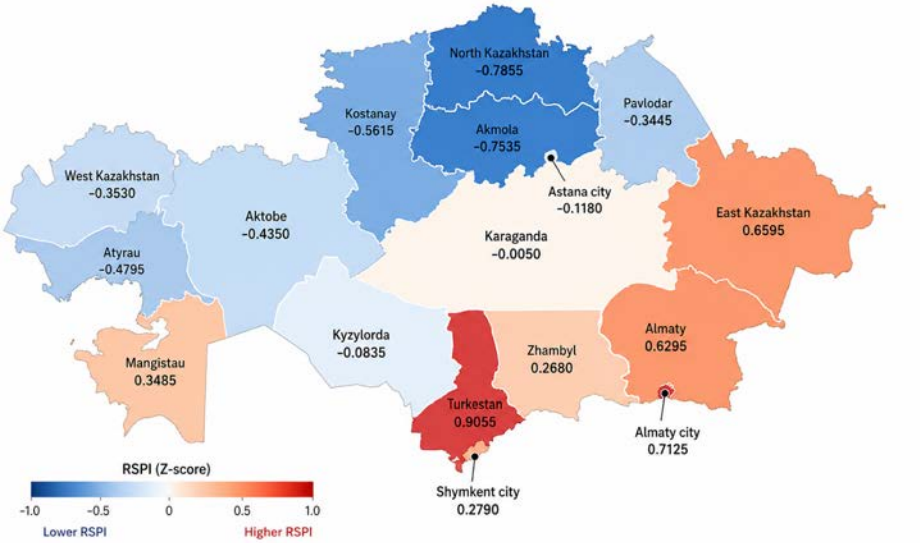
Figure 4 Regional distribution of the RSPI in Kazakhstan (average values, 2014–2024)

The RSPI distribution shows that regions vary significantly in their levels of social support. The highest values are observed in Turkestan (0.95), East Kazakhstan (0.72), Almaty city (0.69), and the Almaty region (0.68). Social assistance covers a significant portion of the population or is accompanied by higher payments. Benefit receipt is more frequent, payments are more stable, and reliance on informal sources of income is lower. Households can cover basic expenses through government transfers.

The next group includes the Zhambyl and Mangystau (0.2 each), Karaganda (0.08) and Shymkent city (0.07). Here, the values are close to each other and remain within the moderate range. In these regions, social assistance is present but does not play a dominant role. For example, payments supplement family income, but do not form its basis.

Negative values are recorded in Kyzylorda (0.16), Astana city (0.12), Pavlodar (0.29), Kostanay (0.38), West Kazakhstan (0.36), Atyrau (0.48), Aktobe (0.49), and Akmola (0.65). The lowest value is observed in North Kazakhstan (0.68). In these regions, payments and coverage are lower. They have a limited number of recipients or lower amounts of assistance. Families often rely on wages or assistance from relatives, with social benefits serving a supporting role.

In the Turkestan region, the high index is due to a significant number of recipients and a lower number of payments. Assistance is distributed among a large number of households, but its volume remains limited. Consequently, regular payments are sufficient to cover basic expenses without creating a reserve. A different situation is observed in the northern regions, including North Kazakhstan, Akmola, and Aktobe Oblasts, where the index values remain negative. Here, coverage is narrower, and payments are lower. Under these circumstances, some members of the population are either not included in the support system or receive minimal support.



Note: Based on Bureau of National Statistics of the Agency for Strategic Planning and Reforms of Kazakhstan, 2024.

Figure 5 Weighted RSPI across regions of Kazakhstan (average values, 2014–2024)

The final score is sensitive to the index structure and the distribution of indicator impor-

tance, as the introduction of weights exacerbated differences between regions. Weighing the indicators revealed that the final index is primarily determined by components related to payment amounts. The Z_BEN indicator, with the highest weight, accounts for the bulk of the result: regions with high payment values experience an increase in the final index even with weak coverage. Z_ASP_AMT has a similar, but less pronounced, effect; the amount of assistance can partially compensate for the limited population coverage.

The coverage indicators (Z_PEN and Z_ASP_REC), despite their significance, have a weaker impact on the final score. Even with high coverage values, their contribution is limited if the payment amount remains low. In such cases, the overall index does not increase, since the contribution of these indicators does not offset the weak values of the more significant components. As a result, an asymmetry of influence is observed: payment indicators act as an amplifying factor, while coverage indicators more often serve a corrective function. There is a compensatory effect: a high level of disbursements can improve the final assessment, whereas high coverage without sufficient funding does not yield a similar result.

The highest values in key indicators that determine the overall score are observed in the Turkestan region (0.9055), Almaty city (0.7125), East Kazakhstan (0.6595), and Almaty region (0.6295). Mangistau (0.3485), Shymkent (0.279), and Zhambyl (0.268) form a middle group in which the indicators are not equally strong.

Weak regions are formed by a combination of negative values for most indicators: North Kazakhstan (–0.7855) and Akmola (–0.7535) have all components below average, resulting in a minimal overall result; Kostanay (–0.5615) also remains in this group, but its position is slightly better due to less pronounced deviations; Atyrau (–0.4795) and Aktobe (–0.435) show moderately low values without sharp dips, making their positions less consistently weak; Karaganda (–0.005) and Kyzylorda (–0.0835) are near zero, as the positive and negative values of the indicators overlap, indicating the presence of individual strong components and the potential for rapid growth if they strengthen.

Thus, the weighting structure indicates that the final assessment is sensitive to the financial aspect of the social protection system, whereas coverage parameters only improve the result when payments are sufficiently high.

5 | CONCLUSION

The results showed that, in some regions, social benefits remain consistently below average, particularly in the north. In terms of the number of pensioners. Higher numbers of pensioners characterise large cities and eastern regions. Therefore, the burden on the payment system in these regions is also higher. The targeted assistance is less stable. The concentration of recipients is particularly pronounced in the Turkestan region, where support accounts for a significant share of the population.

The results also revealed that the social support system varies by region. Thus, a large number of recipients are not associated with higher payments. Conversely, if payments are higher, the coverage is smaller. In some regions, many recipients receive assistance, but the amounts are limited. In some regions, families receive small but regular support; in others, assistance is higher, but access is limited. The Turkestan region stands out for its high coverage at low payments. In northern regions, both coverage and benefits are lower.

The resource distribution system needs to be reviewed. In regions with high burdens, it would be appropriate to strengthen employment measures to reduce dependence on benefits. In regions with low coverage, access conditions need to be reviewed. The government policy should consider developing a mechanism for redistributing resources between

regions to equalise support conditions and reduce disparities. Some financial flows from higher-income regions could be directed to areas with high social burdens.

However, public policy should recognise that strengthening one parameter does not yield sustainable results. Therefore, measures should be developed in a differentiated manner. In regions with systematically low values, it is necessary to increase payment sizes and expand coverage simultaneously. In regions with moderately weak positions, priority should be given to increasing financial support, as this component has a stronger impact on the final assessment. In regions with mixed indicators, it is advisable to selectively strengthen the weakest parameter to allow for faster improvement in the overall situation.

AUTHOR CONTRIBUTION

Writing – Original Draft: Saltanat S. Rakymzhanova, Parida B. Issakhova, Nadiya M. Sabitova.
Conceptualization: Saltanat S. Rakymzhanova.
Formal Analysis and Investigation: Parida B. Issakhova, Nadiya M. Sabitova.
Funding Acquisition and Research Administration: Saltanat S. Rakymzhanova, Parida B. Issakhova.
Development of Research Methodology: Parida B. Issakhova, Nadiya M. Sabitova.
Resources: Saltanat S. Rakymzhanova, Parida B. Issakhova, Nadiya M. Sabitova.
Software and Supervision: Saltanat S. Rakymzhanova, Parida B. Issakhova.
Data Collection, Analysis, and Interpretation: Parida B. Issakhova, Nadiya M. Sabitova.
Visualization: Saltanat S. Rakymzhanova, Parida B. Issakhova, Nadiya M. Sabitova.
Writing – Review and Editing: Saltanat S. Rakymzhanova.

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AUTHOR BIOGRAPHIES

***Saltanat S. Rakymzhanova** – Master of Economic Sciences, Senior Lecturer, Kazakh Ablai Khan University of International Relations and World Languages, Almaty, Kazakhstan. Email: rss1972@mail.ru, ORCID ID: https://orcid.org/0000-0002-6565-879X

Parida B. Issakhova – Doc. Sc. (Econ.), Professor, Almaty Management University, Almaty, Kazakhstan. Email: isakova-777@mail.ru, ORCID ID: https://orcid.org/0000-0001-6320-0489

Nadiya M. Sabitova – Doc. Sc. (Econ.), Professor, Kazan Federal University, Kazan, Russia. Email: sabitovanm@mail.ru, ORCID ID: https://orcid.org/0000-0002-2866-1703

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