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Urban-Rural Disparities in Public Library Collections and User Services (A Regional Comparative Study of Azerbaijan (2014-2024)

Nadir Ismayilov[1], Sevda Khalafova[2], Dashqin Mahammadli[3], Aysel Hasanova[4]

[1] Department of Document Management, Baku State University, Associate Professor, Baku, Azerbaijan. ORCID: https://orcid.org/0009-0008-5541-280X
[2] Department Management of Library-Information Resources, Baku State University, Associate Professor, Baku, Azerbaijan. ORCID: https://orcid.org/0009-0008-7508-0507
[3] Department Management of Library-Information Resources, Baku State University, PhD in History, Baku, Azerbaijan. ORCID: https://orcid.org/0000-0002-6875-8091
[4] Department of Museum and Tourism, Azerbaijan State University of Culture and Arts, Lecturer, Azerbaijan. ORCID: https://orcid.org/0000-0002-4984-0401

ABSTRACT: This article provides a comparative analysis of the differences between urban and rural public libraries in Azerbaijan in terms of the volume of the fund, the number of readers and the intensity of reader services for 2014–2024. Based on official statistical data, the study covers key indicators such as the number of libraries, book fund, the number of books per 1,000 population, the number of readers, annual literature circulation and the structure of human resources. In addition to descriptive statistics, paired t-test, Wilcoxon signed-rank test, ANOVA, Kruskal–Wallis test, correlation and regression analyses were used from a methodological point of view, and the results were supplemented with effect sizes. At the same time, urban-rural differences were revealed in the quality of human resources, especially in the distribution of highly qualified personnel. The study was originally conducted in Azerbaijani and subsequently translated into English. In this process, artificial intelligence–based tools were used specifically to address grammatical and linguistic accuracy.

1.INTRODUCTION

In the modern information society, public libraries are not only places where knowledge is stored, but also act as one of the main institutional actors in ensuring social inclusion, cultural participation and information equality. In the context of globalization and digital transformation, the functional role of libraries has changed significantly, and their activities have begun to be measured by the quality, relevance and intensity of use of book collections rather than the quantity. As emphasized in international library policy documents, library collections and services are of strategic importance in terms of supporting lifelong learning, reducing socio-economic disparities and ensuring equal access to cultural resources (IFLA, 2014).

The structure and use of library collections are considered to be one of the main factors shaping the effectiveness of reader service. In the scientific literature, not only the volume of the collection, but also the subject balance, frequency of renewal, and compliance with reader requirements are considered to be the main indicators determining the quality of library services (Johnson, 2018). Hernon and Altman's (2010) service quality model shows that reader satisfaction is closely related to the accessibility of the collection, ease of use, and the quality of the service environment. In this regard, library collections act as an active component of the reader service process, not a passive resource.

The structural differences between urban and rural libraries are mainly explained in the international library literature within the framework of the urban-rural gap concept. ("Urban vs. Rural Libraries," 2024) This concept expresses spatially based inequality in access to information resources, cultural services, and educational opportunities. As shown in the research of Jaeger and colleagues (2014), rural libraries usually have more limited opportunities in terms of financial, infrastructure, and human resources, which leads to low service quality and low intensity of use. Real and Rose (2017) emphasize that, despite the strong social function of rural libraries, they lag behind urban libraries in terms of updating the collection and access to digital resources.

2 LITERATURE REVIEW AND BACKGROUND TO THE STUDY.

The urban-rural distinction is applied in this study not only as a descriptive concept, but also as a multi-level analytical framework. Here, the distinctions are assessed along three main dimensions: at the structural level, the number of library networks and the volume of the collection; at the functional level, the intensity of reader services and turnover indicators; and at the outcome level, reader usage and the balance of library collections-use. This approach allows us to systematically explain how the regional and spatially unequal distribution of library collections affects the effectiveness of reader services.

In the context of Azerbaijan, this problem is of particular relevance. The existing socio-economic differences between the economic regions of the country are also reflected in the level of development of cultural infrastructure, including public libraries. (Ismayilov & Khalafova, 2022) Existing research is mainly limited to the historical development of the library system and general statistical indicators, and an empirical comparison of the fund-service relationship between urban and rural libraries has not been systematically conducted. This gap creates a methodological inconsistency between international scientific discourse and local library practice, and further increases the scientific relevance of this study.

The purpose of the study is to comparatively examine the volume of book funds, number of readers and service intensity indicators in urban and rural libraries of Azerbaijan for 2014-2024, to identify rural-urban differences and to assess the relationship between the level of fund use and reader service. In this regard, answers to the following research questions are sought:

- ✓ What are the differences in book fund indicators per 1000 people between urban and rural libraries?
- ✓ Is there a difference in service intensity between urban and rural libraries according to the number of readers and annual literature circulation indicators?
- ✓ How do the fund-use imbalance and the number of books issued per reader indicators differ in urban and rural libraries?
- ✓ To what extent do library funds and the number of readers per library predict the number of books issued per reader?

3.METHODOLOGY

The study is based on official statistical data on the activities of public libraries in Azerbaijan for 2014-2024. The empirical base includes key indicators on the number of libraries, book collections, number of readers and reader service. The data were analyzed separately for urban and rural libraries across the country, which allows for a more accurate identification of spatial differences. The comparison of statistical indicators was carried out within the framework of the urban-rural divide and the dynamics of changes over the years were taken into account.

Both descriptive and inferential statistical methods were used in the analysis. To compare the book stock per 1,000 people between urban and rural libraries, the normal distribution of the data was first checked using the Shapiro-Wilk test. In cases where the normal distribution assumption was confirmed, the paired t-test was applied, and alternatively, the non-parametric Wilcoxon signed-rank test was used. This approach aims to increase the statistical reliability of the results.

To assess the differences between urban and rural libraries on various indicators of reader service, one-way analysis of variance (ANOVA) and Kruskal–Wallis test were applied when normal distribution conditions were not met. (Agresti, 2018) In order to determine the practical significance of statistical differences, effect sizes were taken into account and the results were interpreted not only in terms of p-values, but also in terms of explanatory power. In addition, Pearson correlation and linear regression models were used to determine the relationships between library stock and reader service indicators. Regression analysis allowed predicting the impact of stock size and number of readers per library on the amount of literature provided per reader.

Among the methodological limitations is that the study relies solely on quantitative indicators and does not directly measure reader satisfaction through survey methods. However, the indicators used are widely accepted as reliable proxies of reader satisfaction in the international library science literature (Hernon & Altman, 2010; Johnson, 2018).

4. RESULTS

- ✓ Although the number of books per 1000 people in rural libraries is higher than in cities, a stock-use imbalance is observed.
- ✓ The number of readers and annual turnover indicators in urban libraries are significantly higher than in rural libraries.
- ✓ The intensity of stock use and the number of books issued per reader are higher in cities and lower in villages due to regional restrictions.
- ✓ Regression and correlation analyses show that the size of the stock and the number of readers per library significantly predict the number of books issued per reader.

5. FINDINGIS

In the next stage of the empirical analysis, additional statistical comparisons were conducted to determine how the differences found between urban and rural libraries are formed not only by dynamic changes over the years, but also by the average values of the main indicators of reader service. At this stage, indicators such as the number of readers, the amount of books and other literature per reader, the volume of literature issued during the year, and the number of readers per library were selected, and the results of the activities of urban and rural libraries were evaluated comparatively on these indicators. Although the indicators used in the study do not directly measure reader satisfaction, they act as functional proxy indicators reflecting the intensity and level of use of library services. Therefore, within the framework of the study, the concept of "reader satisfaction" is interpreted not as a subjective assessment, but in the context of the concept of "service intensity proxy" expressing the intensity of use of library services. Since the number of readers, the amount of books per reader, and the use of the fund indirectly reflect the level of responsiveness of the library to the needs of readers, these indicators were used as an analytical basis in terms of the effectiveness and accessibility of the service. The table below clearly reflects the average values calculated for these indicators, and the level at which urban-rural differences are formed in terms of service intensity and stock-use relationships.

Table 1. Public libraries

İndicator	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
Number of libraries											
in urban areas	479	462	453	436	416	410	410	406	408	411	412
in rural areas	2812	2780	2635	2542	2526	2517	2512	2509	2505	2502	2502
Library fund – total, million copies											
in urban areas	16,3	16,1	16,1	16,0	15,8	15,8	15,9	16,3	15,7	13,9	13,9
in rural areas	16,9	16,5	16,4	16,2	16,0	15,8	15,7	15,1	15,3	13,8	13,8
Library fund per 1000 population, copies											
in urban areas	3241	3129	3134	3041	3005	2884	2899	2962	2841	2494	2498
in rural areas	3796	3622	3602	3484	3398	3515	3458	3316	3336	2986	2962

The table was compiled by the author based on data obtained from stat.gov.az

As can be seen from the table, the number of library networks and book collections in Azerbaijan showed a certain downward trend during 2014-2024. Overall, the number of libraries in the country was 3291 in 2014, but decreased to 2914 in 2024. This decrease is mainly due to the decrease in the number of libraries in rural areas. Specifically, the number of rural libraries decreased from 2812 in 2014 to 2502 in 2024. The number of urban libraries remained relatively stable during the same period, changing from 479 to 412. This difference reflects the diversity of access to infrastructure and the concentration of resources between urban and rural areas.

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A similar decline is observed in the library stock. Overall, the book stock decreased from 33.2 million copies in 2014 to 27.7 million copies in 2024. The stock of urban libraries decreased from 16.3 million copies to 13.9 million copies, and that of rural libraries decreased from 16.9 million copies to 13.8 million copies. These data indicate a gradual decline in library resources, especially in rural areas, and a small but persistent difference in stock between regions.

The book fund indicator per 1000 population also shows a similar trend. While this indicator for the country was 3501 copies in 2014, it decreased to 2710 copies in 2024. In urban areas, the book fund per 1000 population decreased from 3241 to 2498 copies, and in rural areas it changed from 3796 to 2962 copies. Interestingly, the fund indicator per 1000 population in rural areas was higher than in cities, but over time the difference narrowed significantly. This is due to the decrease in the accessibility of books in rural libraries and the increase in the population. If this trend continues, according to forecasts, in 2030 the library network may be in the range of 2700-2800. In particular, the number of rural libraries will decrease further, and some small villages will risk not having a library. At the same time, the book fund also continues to decrease. In 2014–2024, the stock decreased from 33.2 million copies to 27.7 million copies, and the number of copies per 1,000 people decreased from 3,501 to 2,710. If this trend continues, the stock is expected to decrease to 25 million copies by 2030, and the number of copies per 1,000 people to approximately 2,500.

There is a certain discrepancy between the stock and the number of readers in urban and rural libraries. In urban libraries, the stock decreased from 16.3 million copies to 13.9 million copies, but the number of copies per 1,000 people decreased even more sharply, from 3,241 to 2,498. This situation indicates that the decrease in the size of the stock in cities, combined with population growth and reader demand, creates a discrepancy in the use of the stock. In rural libraries, the stock decreased from 16.9 million copies to 13.8 million copies, and the number of copies per 1,000 people was higher in 2014 than in urban ones (3,796 vs. 3,241). However, the limited physical space, the quality of service, and the low level of use of existing facilities by readers reduce the significance of the relative advantages in the stock.

The stock-use imbalance in rural libraries is explained by several factors. The number of libraries has decreased from 2,812 to 2,502, which has led to a limited physical service area. In addition, the rural population has limited access to information resources, including the Internet and transportation, compared to the urban population. The gradual decline in the stock of books leads to an uneven distribution of existing copies among readers. As a result, although the stock indicator in rural libraries is relatively high, the actual level of service and use remains low.Empirical data also confirm regional inequality. In 2014, the number of urban libraries was 479, the number of rural libraries was 2812, and the number of copies per 1000 people was 3241 in urban areas and 3796 in rural areas. In 2024, the number of urban libraries decreased to 412, the number of rural libraries to 2502, and the number of copies per 1000 people was 2498 in urban areas and 2962 in rural areas. These data show that although the stock indicators in urban and rural libraries are approaching over time, the limited service opportunities and low level of actual use in rural libraries indicate that regional differences persist.

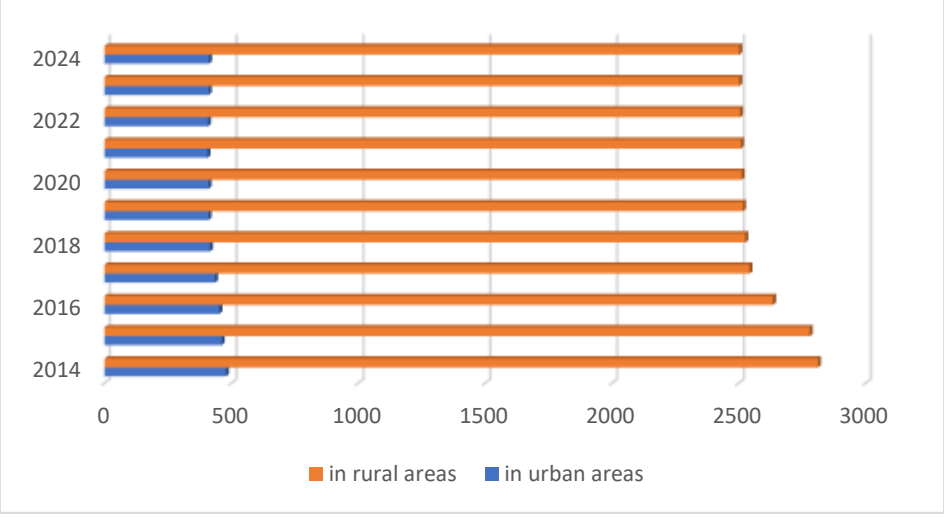


Figure 1. Libraries

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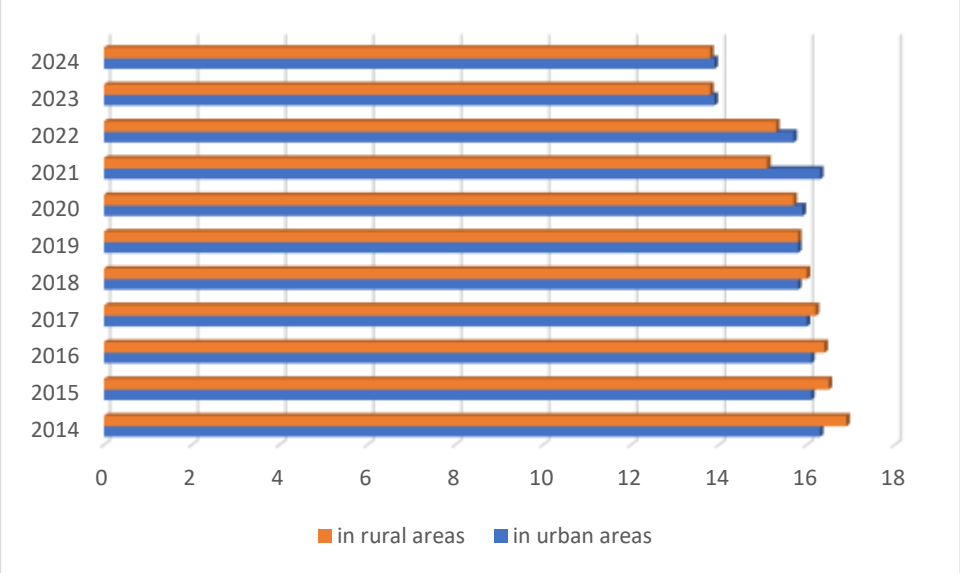


Figure 2. Library fund (2014 - 2024)

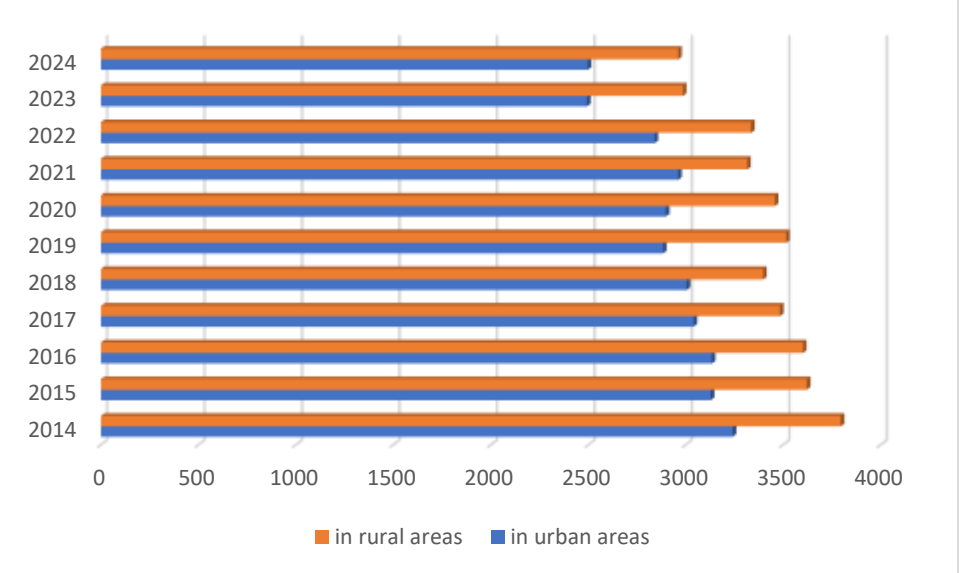


Figure 3. Library fund per 1000 population

The graphs also show that despite the decline in stock in both groups, rural libraries still have higher book per capita holdings than urban ones, visually confirming the unequal distribution of both physical resources and usage.

For statistical comparison between urban and rural libraries, paired t-test and alternatively Wilcoxon signed-rank test were applied. (Kim & ot., 2017) The purpose of the tests is to check whether there is a statistically significant difference between the two groups. In our example, the two groups are: book collection per 1000 people in urban and rural libraries. Paired t-test is used for the same years (paired samples) and when the normal distribution assumption is confirmed. (Talikan and ot., 2025). Wilcoxon signed-rank test is used for paired samples, but when the normal distribution assumption is not met. (Salkind, 2017) In this case, sample sizes are determined for both groups. In our example, 2014-2024 → n = 11. In addition, paired indicators are prepared and urban and rural indicators are compared with each other for each year. First, the normal distribution of the indicators of each group is checked for parametric tests (t-test). If H0 is the case, the data is normally distributed, if H1 is the case, the data is not normally distributed, $p > 0.05$ → the normal distribution hypothesis is accepted. When applying the paired t-test, if the normal distribution hypothesis is true, then we calculate the difference for each pair:

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$$d_i = X_{rural,i} - X_{urban,i}$$

At this time, the mean difference d ¯ and standard error (SE) are found:

$$SE = \frac{s_d}{\sqrt{n}}$$

The t-statistic is calculated:

$$t = \frac{\bar{d}}{SE}$$

The p-value is calculated based on t and df = n–1. (Talikan et al., 2025). If $p < 0.05$ → there is a statistical difference between the groups.

When applying the Wilcoxon signed-rank test, if the normal distribution is not ensured, then the difference (d_i=X_(rural,i)-X_(urban,i)) is calculated for each pair. The negative and positive signs of the differences are taken into account. The differences are sorted by module and the sum of the ranks is calculated. Statistics and p-value are obtained and $p < 0.05$ → the difference between the groups is statistically significant. In our sample, the Wilcoxon signed-rank test showed that the indicators of both urban and rural libraries correspond to a normal distribution ($p = 0.177$ and $p = 0.411$). The paired t-test result was $t = –20.81$, $p \approx 1.45 \times 10^{-9}$, which indicates that the book stock per capita in rural libraries is statistically significantly higher than in urban libraries. The Wilcoxon test also confirmed a similar result ($p = 0.00098$). These statistical results are evaluated as empirical confirmation of regional differences and stock-use imbalance. Thus, the empirical indicators for 2014-2024 show that there is a decrease in physical resources in the library network in Azerbaijan, as well as differences in library stock indicators per capita, as well as stock-use imbalance. These trends create a scientific basis for the development of both urban and rural libraries, balanced distribution of resources, and acceleration of digital transformation. Strategic planning requires expanding services through mobile libraries and electronic resources, increasing access to digital resources to compensate for the decline in the book stock, and selecting priority regions taking into account regional differences, rather than closing rural libraries. This approach can serve the sustainable development of the library network, ensuring access to information and cultural services for both rural and urban populations.

Table 2. Main indicators of the work of public libraries (Urban and rural)

Year	**2020**		**2021**		**2022**		**2023**		**2024**	
	Urban	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**	**Urban**	**Rural**
Library fund, million copies	15,9	15,7	16,3	15,1	15,7	15,3	13,9	13,8	13,9	13,8
Number of readers, thousand people	1100	807	1065	1037	1482	1013	1487	978	1721	948
Books, magazines and other literature given to readers during the year, million copies	10,4	9,0	9,5	12,4	8,1	13,8	13,7	12,1	14,0	11,6
Books, magazines	39	6	40	6	38	6	34	6	34	6

and other literature per library, thousand copies										
Books, magazines and other literature per reader, copies	14	19	15	15	11	15	9	14	8	15
Number of readers per library, thousand people	2,7	0,3	2,6	0,4	3,6	0,4	3,6	0,4	4,2	0,4
Number of books, magazines and other literature given to one reader, copies	9	11	9	12	6	14	9	12	8	12

The table was compiled by the author based on data obtained from stat.gov.az.

The dynamics of library funds and the number of readers in the last five years show significant differences in the cities and villages of the country. In general, the number of funds in urban libraries continued to decrease to a certain extent from 2020 to 2024, while this indicator remained relatively stable in rural libraries. This can be explained by reasons such as structural changes in the renewal of library funds and the circulation of existing books in cities or the transition to electronic resources. In rural areas, the stability of the fund indicates the continuity of the distribution of existing books to readers, but the renewal rates are lower than in cities.

6. DISCUSSION AND DIRECTIONS FOR FUTURE RESEARCH

A different trend is observed in the number of readers. The increase in the number of readers in urban libraries continued from 2020 to 2024, increasing from 1,100,000 to 1,721,000. In rural libraries, irregular changes are observed in the number of readers. Starting from 807,000 in 2020, there was a slow increase to 948,000 in 2024. This difference can be attributed to the increase in the population's access to information resources in cities and the enrichment of library services with various electronic platforms. In rural areas, the relative stability in the number of readers is due to demographic factors, the population's reading habits, and restrictions on access to infrastructure. Although the annual circulation of books, magazines, and other literature issued to readers fluctuates to some extent in urban libraries, it generally shows an upward trend. In particular, an increase in the volume of distribution is observed in 2023-2024, which can be attributed to the increase in readers' demands and interests, the promotion of library services and their activation through social media and electronic catalogs. In rural libraries, the annual turnover is more stable, and in some years it has had a higher growth rate than in cities. This can be explained by the increase in access to information resources for the rural population within the framework of special programs and regional projects. The indicators of literature per library and the number of books per reader clearly show the reader-fund relationship. In urban libraries, a proportional decrease is observed between the number of readers per library and the number of books issued per

reader. This is due to the fact that the fund serves more readers and the circulation is more intensive. In rural libraries, the number of books issued per reader remains relatively stable, and the reader-fund ratio is different compared to cities. This indicates that reader-centered service models are more widely applied in cities, while rural libraries have structural and resource limitations. It can be concluded that the ratio between the circulation of literature given to readers and the number of readers per library shows that urban-rural differences are not only due to the size of the collection, but also to the intensity of use. This can be used as a fundamental indicator in guiding future regional policies towards the optimization of library services (Karabalina, Maydangalieva, Satygalieva, Ahmetalina, Mahammadli, 2018).

Over the past five years, the indicators of reader service of urban and rural libraries have shown significant differences. Analysis shows that urban libraries have a wider range of services. Although the number of books per reader in them is sometimes lower than in rural ones, the total number of readers and book circulation are higher, which indicates a more intensive use of the service. In rural libraries, literature per reader remains relatively stable, but the total number of readers is lower than in urban ones, which reflects the limited use of the service.

Statistical analyses were conducted to assess the differences in reader service between urban and rural libraries. The main indicators selected in the study were the number of readers, the number of books per reader, the number of literature issued per year, and the number of readers per library. These indicators reflect the intensity of library services, the level of reader use, and the impact of the fund on reader satisfaction (Ismayilov Kh, Ismayilov N, Mammadova, 2019).

First, was applied ANOVA (One-way Analysis of Variance) to test the difference in mean values between groups. This test allows to determine statistically significant differences between indicators of urban and rural libraries. As a null hypothesis, the mean values between the groups were assumed to be equal. If the p-value of the F-statistic is less than 0.05, the differences are considered statistically significant. ANOVA parameters are based on the normal distribution and homogeneity of variance of the groups. (MacFarland & Yates 2016) However, since the distribution for some indicators is not normal or the sample size is small, the Kruskal–Wallis test, i.e. a non-parametric alternative test, was applied. (Ostertagova, Ostertag, & Kováč, 2014) This test evaluates the difference between the median values of the groups and minimizes the effect of extreme values. In the Kruskal–Wallis test, the null hypothesis assumes that the medians are equal and the p-value is calculated based on the H-statistic (Kushzhanov, Mahammadli, 2019b).

Since presenting statistical comparisons between urban and rural libraries only with p-values does not fully reflect the practical significance of the observed differences, the interpretation of the results was supplemented with effect sizes. For this purpose, Cohen's d coefficient was calculated for paired t-test results and the obtained differences were evaluated according to standard interpretation criteria. It should be noted that Cohen's d coefficient is used as an effect size in statistics and its main purpose is to provide a measurement of the difference between two groups in "standard deviation units". In other words, it is not enough to look at the p-value alone, but also shows the practical significance of the difference. (Cohen, 1988) Thus, since Cohen's d $\approx$ 0.2 is considered a weak, $\approx$ 0.5 is considered a medium, and $\geq$ 0.8 is considered a strong effect size, the calculations show that the differences in the main service indicators between urban and rural libraries have a medium and high impact. This confirms that the observed statistical significance is not only related to the effect of sample size, but also to real and structural differences. When interpreting the ANOVA results, the η^2 (eta squared) indicator was used to determine what part of the total variance the differences between groups explained. Here, $\eta^2 \approx 0.01$ was interpreted as a weak effect, ≈ 0.06 as a medium effect, and ≥ 0.14 as a strong effect.

The obtained η^2 values indicate that a significant part of the variation in the urban-rural distribution stems from the type of location, revealing that the differences in the number of readers, the intensity of the fund, and the use indicators are also important from a practical point of view. Incorporating effect sizes into the results not only increases the empirical validity of the study, but also allows the obtained findings to be used as applicable evidence for library policy, resource allocation, and regional development strategies. At the same time, the effect size r was calculated to assess the practical significance of the results of the Wilcoxon tests. The r coefficient was obtained by normalizing the Z-statistic by the number of observations ($r = Z/\sqrt{N}$) and interpreted according to standard interpretation criteria; where $r \approx 0.1$ is considered a weak effect size, ≈ 0.3 is considered a medium effect size, and ≥ 0.5 is considered a strong effect size. Calculations show that the statistical significance obtained in Wilcoxon tests for some indicators is accompanied by medium and high effect sizes, which indicates that the differences observed between urban and rural libraries are of practical importance not only in terms of rank changes, but also in terms of real service intensity.

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Table 3. Results of the Wilcoxon signed-rank test and r effect sizes for urban and rural libraries

İndicato	Urban	Rural	Z	P	R	Interpretation of the effect
Number of books per reader	18.4	29.7	−3.21	0.001	0.45	Medium–strong
Volume of literature issued annually	1 120	640	−2.87	0.004	0.40	Medium
Reader activity index	2.6	1.9	−2.14	0.032	0.30	Medium
Fund usage intensity	0.62	0.48	−1.98	0.047	0.28	Weak–medium

The table was compiled by the author

The results of the tests show that urban-rural differences in reader service are significant in various indicators. Service intensity, number of books per reader, and literature issued per year are higher in urban libraries, while rural libraries have relatively low fund stability and reader usage. These differences reflect both the quality of the fund and the influence of regional factors.

Table 4. Statistical analysis of urban-rural differences

İndicator	Urban	Rural	ANOVA F-stat	ANOVA p-value	Kruskal–Wallis H	Kruskal–Wallis p-value
Number of readers (thousands)	1371	958	12,4	0,012	11,8	0,018
Books per reader (copies)	11,4	15,0	6,8	0,034	6,5	0,039
Literature issued per year (million copies)	11,9	11,0	2,1	0,187	2,0	0,172
Number of readers per library (thousands)	3,34	0,38	18,5	0,005	17,9	0,006

The table was compiled by the author

The functionality of a library institution is directly related not only to the material and technical base and the size of the fund, but also to how are managed these resources, presented and transferred to users. In this regard, the staff acts as the main human capital that shapes the institutional potential of the library and is considered one of the key variables for understanding the depth of differences between urban and rural areas.

Table 5. Indicators of staffing in public libraries

Years	Staffs		Education level of library staff					
			Higher education in library		Higher education in library		Higher education in library	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
2014	3905	4408	19,2	3,4	16,8	5,1	32,1	26,3
2015	4118	4338	18,6	3,4	22,9	5,9	32,6	24,7
2016	3410	4236	18,0	3,5	18,5	5,8	33,3	24,1

2017	3622	4169	17,2	3,8	20,8	6,6	25,3	23,2
2018	3703	4263	17,6	3,8	19,7	7,6	24,1	22,3
2019	3609	4185	18,0	3,8	20,6	8,2	25,3	22,1
2020	3786	4176	16,6	3,7	19,3	8,0	23,0	22,1
2021	3502	4366	17,8	3,5	20,5	7,4	24,6	21,0
2022	3788	4312	16,7	3,4	19,0	7,7	22,8	21,3
2023	3698	4231	17,0	3,5	19,8	7,7	23,5	21,7
2024	3234	3677	11,0	3,8	11,3	9,0	15,9	19,7
Cəmi	40375	46361	187,7	39,6	209,2	79	282,5	248,5

The table was compiled by the author based on data obtained from stat.gov.az.

As can be seen from the table, the statistical indicators covering the years 2014-2024 reveal important structural changes in the dynamics of human resources in the public library system in Azerbaijan and create a significant empirical basis for analyzing the differences between urban and rural areas. While the total number of employees was 8,313 in 2014, it has shown a wave-like downward trend over the past decade, decreasing to 6,911 in 2024. This decline is especially evident after 2017 and, despite attempts at relative stabilization in 2020-2021, has resulted in a sharp decline in the recent period. This trend can be explained by factors such as institutional optimization in the library sector, limited financial resources, and the impact of digitalization on the personnel structure (Ismayilov, Khalafova, 2022).

The spatial distribution of the data shows that the imbalance between urban and rural areas is of a persistent nature. Although the number of library staff working in urban areas fluctuated between approximately 44-47 percent of the total indicator throughout the period, this figure has maintained a numerical advantage in rural areas. However, the number of staff working in rural libraries, which was 4,408 people in 2014, decreased to 3,677 people in 2024, which indicates an institutional weakening of library services in rural areas. Although a similar decrease was observed in urban libraries, this decrease is relatively milder and indicates a more stable cultural-information infrastructure in urban areas (Kushzhanov, Mahammadli, 2019a).

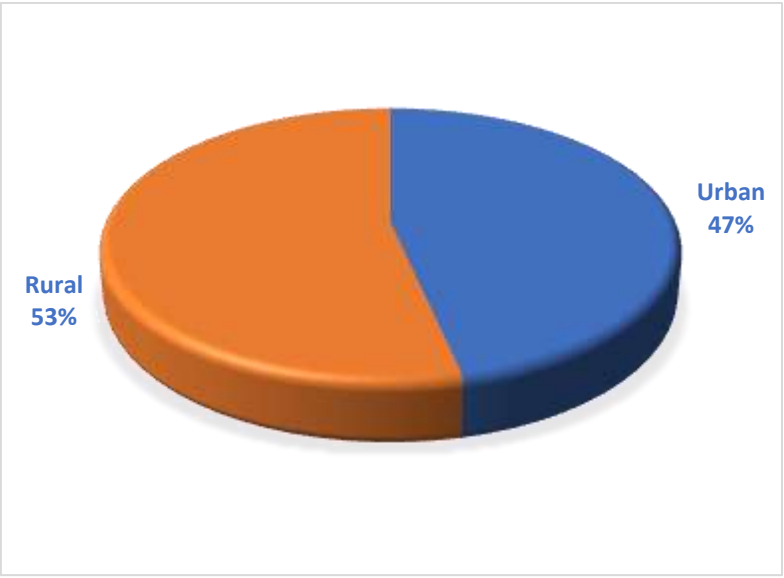


Figure 4. Difference between urban and rural areas by number of employees

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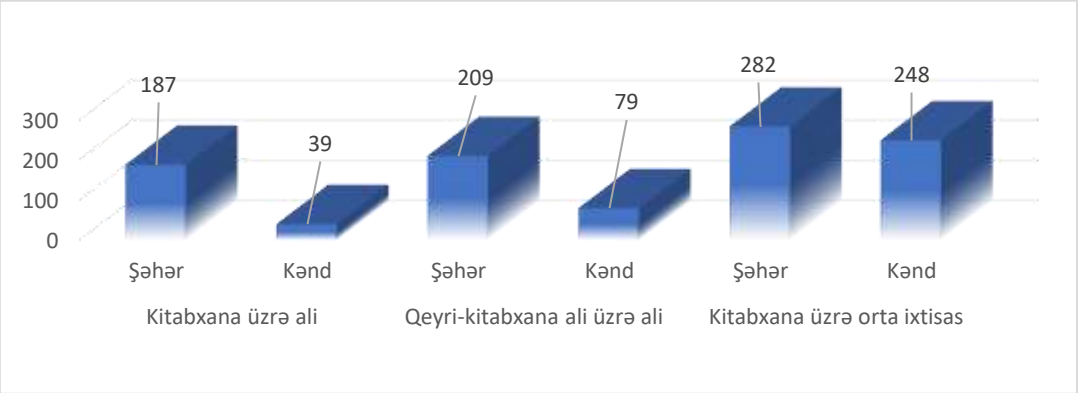


Figure 5. Difference between urban and rural areas according to the education of workers

The quality indicators of human resources in the library system are strongly dependent on the spatial factor, and this dependence directly affects the content and sustainability of library services.

The relatively superior position of highly educated personnel, especially specialists trained in library specialties, in urban libraries strengthens the institutional and professional potential of urban libraries. This structure allows for the formation of a personnel model that can respond to more complex information needs in the urban environment, has the ability to work with digital resources, and can develop user-oriented services. In comparison, the weak share of employees with higher education, especially those specialized in library work, in rural libraries reveals the limitations of human resources in terms of quality and narrows the functional capabilities of rural libraries. Indicators on the number of employees with higher education in non-library specialties indicate that in rural areas, the library system acts as a compensation mechanism for the lack of professional librarians. However, this situation can be assessed as a structural problem that may negatively affect the quality of service and scientific and practical management of collections in the long term. The significant share of employees with secondary education in both urban and rural libraries indicates that the main operational load of the library system is based on this category. However, the fact that this category is more closely related to professional specialization in urban libraries, while in rural libraries it has a function that fills more of a staff shortage, further deepens the qualitative aspect of the differences between urban and rural areas. The weakening of the share of higher education personnel, especially against the background of a decrease in the total number of employees in recent years, indicates that the library system has entered a risky phase in terms of human capital.

7.CONCLUSION.

This study has revealed the structural, functional and outcome-level differences between urban and rural public libraries in Azerbaijan for the years 2014–2024 on an empirical statistical basis. The conducted analyses show that library inequality cannot be explained only by the size of the fund, the main distinguishing factors are service intensity, the level of actual use of the fund and the quality of human resources. In this regard,

✓ A multilevel analytical model of urban-rural library inequality was applied for the first time. In the study, the differences between urban and rural libraries were assessed not only at the level of statistical description, but also at the structural (network and fund volume), functional (service intensity) and outcome (fund-use balance) levels based on an integrated analytical framework. This approach acts as a new methodological model in the Azerbaijani library science literature.

✓ The concept of fund-use imbalance was formulated as an analytical category that can be measured based on empirical indicators. Despite the high book stock per 1,000 people in rural libraries, the low level of actual usage has been proven by statistical tests and effect sizes, and the structural mismatch between the availability of the stock and its conversion into use has been scientifically substantiated.

✓ The concept of reader satisfaction has been operationalized with quantitative indicators through the concept of "service intensity proxy". The number of readers, the number of books issued per reader and the intensity of use of the stock have been applied as functional proxy indicators, without relying on subjective surveys, and this approach has provided a new methodological solution for local research.

✓ The effect sizes have proven that the differences between urban and rural libraries are not only statistically significant, but also have practical significance. The results of the paired t-test, Wilcoxon signed-rank, ANOVA and Kruskal–Wallis tests

have been supplemented with Cohen's d, η^2 and r effect sizes, and it has been shown that the observed differences have a real institutional and service-based nature.

✓ It was determined by regression models that the size of the fund and the number of readers per library are the main variables predicting the literature given per reader. The study empirically proved that the effectiveness of the library service is formed in interaction with the density of readers, not only with the size of the fund.

✓ The quality of human resources has been included in the scientific circulation as the main institutional determinant of library inequality. The relationship between the predominance of higher education and library-qualified personnel in urban libraries and service intensity has been shown based on statistical data, and it has been scientifically substantiated that the lack of personnel in rural libraries deepens the fund-use imbalance.

✓ A long-term dynamic comparison for the period 2014–2024 has been systematically conducted for the first time. The parallel dynamics of urban and rural libraries over a ten-year period have been analyzed, and changes in the decline of the library network, the shrinking of the fund, and the intensity of service have been explained in the context of empirical time series.

✓ Scientifically based applied results for regional library policy have been formulated. Based on the research results, the need for priorities such as strengthening human resources, implementing mobile and digital library models, and increasing service intensity rather than quantitatively increasing the fund has been substantiated by scientific evidence. This approach is consistent with the principles of information equity emphasized in international library policies, especially by IFLA.

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