



Demographic Analysis and Resource Allocation in Humanitarian Aid: A Case Study of Age-Specific Service Provision

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ABSTRACT

Purpose – The purpose of this study is to address a gap in the existing literature on humanitarian service use by Ukrainian refugees in Slovakia. In particular, it examines the patterns of service use by different demographic groups and considers the implications of these patterns for the allocation of resources.

Aims(s) – The principal aim is to analyse the variations in service utilisation across different demographic groups and service categories. Secondary objectives include the identification of trends in service delivery over time and the drawing of implications for future humanitarian response strategies.

Design/methodology/approach – The study employs a quantitative, cross-sectional methodology, analysing data from a charitable organisation situated in the Slovakian midlands. The service delivery records of 1,033 cases, encompassing seven categories, were examined over the period from November 2023 to March 2024. The data analysis comprised descriptive statistics, chi-square tests and time series analysis.

Findings – The results revealed a significant gender disparity, with women utilizing 73.3% of the services in question. With regard to age, the 45-60 age group constituted the largest proportion of service users (39.5%). The most frequently provided services were food assistance and hygiene support. The time series analysis revealed a peak in November 2023, followed by a gradual decline.

Limitations of the study – The study is limited by its focus on a single organisation and region, which restricts the potential for generalisation. A five-month study period may not be sufficiently long to capture long-term trends or seasonal changes.

Originality/value – The study provides evidence-based insights for more targeted and effective resource allocation in refugee assistance and contributes to the growing body of literature on demographic analysis in humanitarian contexts.

KEY WORDS

humanitarian aid, demographic analysis, gender disparities, age-specific needs, ukrainian refugees, Slovakia

JEL Code: J15, F22, I38, O15

DOI: [10.46287/DSAA7708](https://doi.org/10.46287/DSAA7708)

1 INTRODUCTION

The ongoing humanitarian crisis resulting from the conflict in Ukraine has led to a significant influx of refugees in European countries, including Slovakia. This situation presents unique challenges for humanitarian organisations in terms of resource allocation and service provision. According to the statistical information, approximately six million Ukrainian refugees are now residing across Europe, with approximately 274,000 located in Austria, Hungary, Slovakia, and Slovenia. The prolonged nature of this displacement has severely tested the resilience of these individuals. Many now face increased mortality risks due to the exhaustion of their resources and coping mechanisms, often exacerbated by job loss or income reduction (UNHCR, 2023). To address these challenges, human resource management strategies must align with Sustainable Development Goal (SDG) 8: Decent Work and Economic Growth, prioritizing the employment needs of refugees to prevent further job loss and income reduction.

Ensuring inclusive labor markets and creating job opportunities for displaced individuals can help rebuild their resilience and secure their livelihoods. Furthermore, alignment with SDG 1: No Poverty is crucial. By implementing social protection systems and measures tailored to refugees, humanitarian organizations can work towards alleviating poverty among the displaced population. Additionally, in line with SDG 3: Good Health and Well-being, it is imperative for humanitarian organizations to facilitate access to healthcare services for refugees. This will mitigate increased mortality risks and support their mental and physical health resilience. Moreover, integrating SDG 4: Quality Education into human resource initiatives can provide educational and training opportunities for refugees, enhancing their skills and improving their employability, thereby fostering long-term economic integration and personal development.

The United Nations projects that by 2025, over 14.6 million people—roughly 40% of Ukraine's population—will require humanitarian assistance. This situation poses substantial challenges for aid organizations in terms of resource allocation and service delivery. As noted by Sekara et al. (2023) emphasize the critical importance of accurate, current demographic data for humanitarian organizations to effectively adapt their interventions and allocate resources. In the context of Slovakia, gaining a comprehensive understanding of the demographic profile and specific needs of Ukrainian refugees is essential to ensure equitable and efficient aid distribution. Ukrainian refugees had to start a new life in Slovakia and had to go through various difficulties and barriers in the process of adaptation and integration. Immediately after the outbreak of the war in Ukraine, non-governmental organizations (NGOs) and Charitable organizations in Slovakia immediately mobilized to help the people of Ukraine. NGOs and Charities were dedicated to distributing basic material and food aid and providing initial psychological and social support. The Charitable Organization in Central Slovakia, in which we conducted research, provides humanitarian aid to refugees from Ukraine at the border from February 24, 2022, to the present.

The principal objective of this study is to analyse the patterns of humanitarian service utilization by Ukrainian refugees in Slovakia, focusing on demographic differences and their implications for resource allocation. The study aims to identify patterns and trends that can inform future resource allocation and service planning by examining the distribution of various support services across different age groups and genders. This approach aligns with the findings of Latoner et al. (2023), who advocate for a rights-based approach to digital humanitarian interventions, ensuring that technology bolsters the dignity and agency of affected populations rather than undermining them. This study was guided by the research question: *How do the utilization patterns of humanitarian support services by Ukrainian refugees in Slovakia vary across different demographic groups (age and gender) and service categories, and what implications do these patterns have for future resource allocation and service delivery strategies?*

The research question thus posed covers the main aspects of the study, including demographic analysis, different categories of services, and potential implications for future humanitarian relief efforts. It allows for a comprehensive examination of the data provided and can lead to valuable in-sights for improving aid distribution and effectiveness.

In light of the selected integrated theoretical framework and existing literature on refugee assistance and humanitarian aid, it is proposed that there will be significant variations in the utilisation of humanitarian support services by Ukrainian refugees in Slovakia across demographic groups and service categories.

H1. Women utilize a significantly higher proportion of humanitarian aid services overall compared to men, particularly in categories such as food aid, hygiene support, and language education.

H2 Different age groups showing distinct patterns of service utilization, with working-age adults (25-54) accessing a wider range of services, including job placement and language training, compared to younger and older age groups.

H3 Food assistance and shelter support being the most utilized services across all demographic groups, reflecting the primacy of basic needs in humanitarian contexts.

H4 Education and integration services showing increasing utilization over time, indicating a shift from immediate survival needs to longer-term integration goals.

By testing this hypothesis, this study aims to provide empirical evidence that can inform more targeted and effective resource allocation strategies in humanitarian contexts. The findings are expected to contribute to the growing body of literature on demographic analysis in humanitarian aid and offer

practical insights for organizations working with refugee populations. This comprehensive research question and hypothesis encompass the main aspects of the study, including demographic analysis, different categories of services, and potential implications for future humanitarian relief efforts.

2 THEORETICAL FRAMEWORK

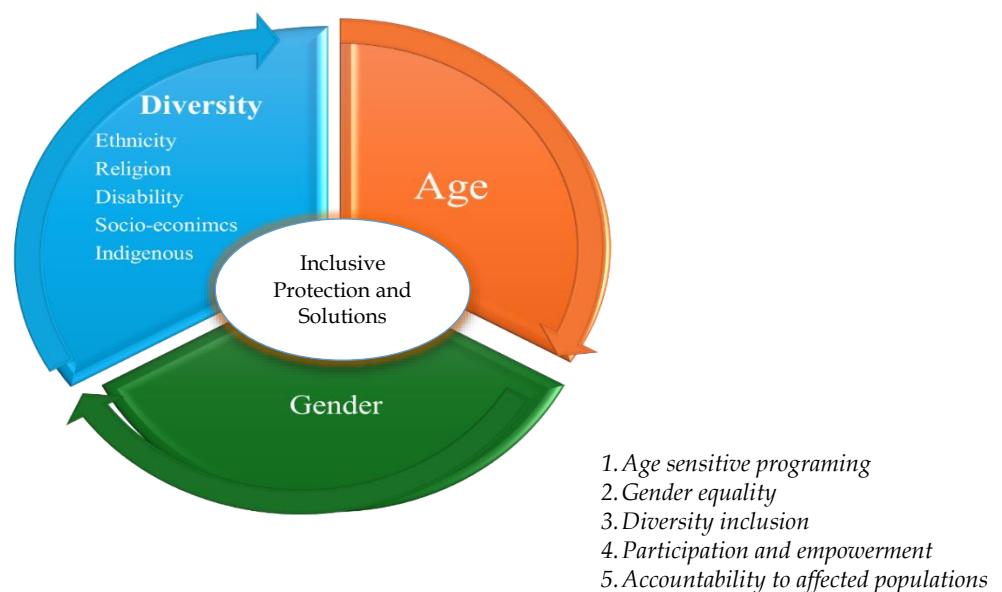
This study employs a multi-faceted theoretical framework to provide a comprehensive basis for analyzing humanitarian aid utilization and resource allocation patterns among Ukrainian refugees in Slovakia. The Age, Gender and Diversity (AGD) approach, a comprehensive framework developed by the Office of the United Nations High Commissioner for Refugees (UNHCR) to guide humanitarian action and promote equality and protection for all persons of concern (UNHCR, 2018). The AGD approach provides a robust theoretical basis for the analysis of the utilisation of humanitarian services by Ukrainian refugees in Slovakia, with a particular focus on demographic differences.

The AGD approach posits that the experiences, needs and vulnerabilities of displaced people are significantly influenced by their age, gender and other diversity factors, including disability, ethnicity and sexual orientation (Figure 1). This framework emphasises the necessity of acknowledging and re-engaging with these diverse characteristics in order to guarantee that humanitarian assistance is inclusive, equitable and effective (UNHCR, 2018). The AGD approach is particularly relevant for understanding resource allocation patterns in humanitarian aid because it emphasizes the need for:

1. Age-sensitive programming: Recognizing varying needs across age groups (Shultz et al., 2022).
2. Gender equality: Addressing unique challenges based on gender identity (Krause & Sharpe, 2022).
3. Diversity inclusion: Acknowledging the impact of various diversity factors (Bhattacharya et al., 2021).
4. Participation and empowerment: Incorporating diverse perspectives in program design (Fernandez-Aranda et al., 2020).
5. Accountability: Ensuring aid delivery is responsive to all demographic groups (Dijkzeul & Sandvik, 2019).

By applying the AGD approach, we can analyze how demographic factors influence service utilization patterns and identify potential gaps or inequalities in resource allocation.

Fig 1. UNHCR Age, Gender, and Diversity (AGD) Framework, Promoting Equality and Protection for All Persons of Concerns



source: UNHCR United Nations High Commissioner for Refugees, 2018.

To complement the AGD approach and provide a more nuanced understanding, we also draw on intersectionality theory as applied to refugee studies by Erdal and Oeppen (2018). This theory posits that different social categorisations interact and overlap, creating interdependent systems of discrimination or

disadvantage. In the context of humanitarian assistance, Intersectionality Theory can help us understand how multiple and intersecting identities affect individuals' access to and utilisation of services.

This framework acknowledges the existence of differences in the needs and abilities of individuals across various age groups. This is consistent with the categorisation of service use across different age cohorts (18-34 years, 35-44 years, 45-60 years) as identified in our study, which allows us to explore the impact of age on patterns of service use.

The AGD approach emphasises the necessity of comprehending and addressing the distinctive challenges and prospects confronted by individuals in accordance with their gender identity. This principle is reflected in our analysis of patterns of service use among men and women, which provides insight into potential gender differences in access to or preference for certain types of assistance. While the AGD approach is primarily concerned with age and gender, it also acknowledges the influence of these factors in conjunction with other dimensions of diversity on individual experiences. Although the study primarily examines age and gender, this principle informs the interpretation of the results, with the understanding that observed patterns may be influenced by other, unmeasured diversity factors.

The AGD framework emphasises the necessity of incorporating a diverse range of perspectives in the design and implementation of humanitarian programmes. While our study does not directly measure participation, an analysis of patterns of service use across demographic groups can indicate the extent to which different segments of the refugee population are reached by existing aid programmes. A fundamental tenet of the AGD approach is the collection and analysis of data disaggregated by age and gender. Our methodology is directly based on this principle, which includes an analysis of service use data in these demographic categories.

By adopting the AGD approach as a theoretical framework, we situate this study within a well-established and widely accepted model in human services research and practice. This framework provides a robust rationale for our focus on demographic differences in service use and offers a structured lens through which to interpret our findings. By basing our study on the AGD approach, we aim to contribute to the growing body of evidence on the importance of age- and gender-sensitive humanitarian programming. Our findings will provide empirical support for the principles of the AGD approach and offer practical insights for implementing these principles in the context of assistance to Ukrainian refugees in Slovakia.

3 METHODOLOGY

This study used a quantitative, observational approach to analyse the use of humanitarian aid services by Ukrainian refugees in Slovakia. The research design follows a cross-sectional methodology that allows for the examination of patterns of service use across different demographic groups at specific points in time (Gao et al., 2023). This approach is in line with recent trends in human research highlighted by Betts et al. (2021), who emphasise the importance of timely data-driven assessment in rapidly evolving crisis situations.

3.1.1 DATA COLLECTION AND SAMPLING

The data was gathered from a charitable organisation operating in Slovakia (Banská Bystrica), which provides a range of humanitarian assistance to Ukrainian refugees. The data collection period spanned from November 2023 to March 2024, encompassing a five-month period of service provision. This timeframe was selected to encompass recent trends while enabling a comprehensive analytical analysis, as recommended by Knipp et al. (2022) in their study on temporal dynamics in humanitarian aid provision.

The study used a convenience sampling method that included all Ukrainian refugees who accessed services through the participating charity during the study period. Although this method may introduce some bias, it is consistent with the pragmatic approach that is often needed in humanitarian contexts, as discussed by Shuja et al. (2021) in their review of sampling techniques in crisis-affected populations.

3.1.2 DATA SOURCES AND CATEGORIES

The study focused on seven different categories of humanitarian assistance, reflecting the multiplicity of needs of refugees, as reported by UNHCR (2023). These categories include a wide range of services that are essential for the well-being and integration of refugees:

1. Transport/ transportation: this category includes services that help refugees move between locations, which can be critical to accessing other services or reaching safe areas.
2. Hygiene: Addressing personal hygiene is essential for health and dignity. This category is likely to include the provision of toiletries, hygiene items and possibly access to showering facilities.
3. Integration activities: These services aim to help refugees adjust to their new environment and may include cultural orientation sessions, community engagement events and other activities that facilitate social inclusion.
4. Language learning: learning the Slovak language is often crucial for refugees to integrate into the host community, find employment and access services independently.
5. Material assistance: This broad category can include the provision of clothing, household goods and other non-food items.
6. Food assistance and food distribution: Ensuring access to adequate nutrition is an essential aspect of humanitarian assistance.
7. Social assistance: This category is likely to include various forms of psychosocial support, counselling and other services addressing the social and emotional needs of refugees.

In order to analyse in detail, the patterns of service use, information on beneficiaries was categorised by gender (male, female) and age group (18-34, 35-44, 45-60). This demographic categorization allows for the identification of potential differences in needs and access to services across different segments of the refugee population. Such insights can be invaluable for tailoring aid delivery and ensuring that the specific needs of different demographic groups are adequately addressed.

This comprehensive approach to categorising both services and beneficiaries is in line with current best practice in humanitarian assistance, recognising that the needs of refugees are diverse and often age and gender specific. By examining these categories in detail, the study aims to provide a comprehensive understanding of how humanitarian assistance is used by Ukrainian refugees in Slovakia, which can inform more effective and targeted assistance strategies in the future.

3.1.3 DATA PROCESSING AND QUALITY CONTROL

Data from the organisation's records were processed into a structured database. Each instance of service delivery was coded according to service category, date, and beneficiary demographics. Data were then anonymized to protect the privacy of individual beneficiaries according to best practices in humanitarian data management (Qadir et al., 2021).

A two-step verification process was implemented to ensure data accuracy:

1. Initial data entry was cross-checked by a second staff member.
2. A random selection of 10% of the records was made to verify with the original records.

This approach to data quality control is in line with the recommendations of Akter and Wamba (2021) to ensure the reliability of humanitarian data in complex operational environments.

3.1.4 ETHICAL CONSIDERATIONS

The study protocol was reviewed and approved by the Ethics Committee of Matej Bel University, number 142a/2024. All data were anonymized and aggregated to protect the privacy of individuals. The research followed the principles outlined in the Declaration of Helsinki and adhered to GDPR data protection guidelines. In addition, the study incorporated ethical considerations specific to refugee research as outlined by Clark-Kazak (2021), including sensitivity to power dynamics and the potential vulnerability of the study population.

3.1.5 DATA ANALYSIS

Descriptive statistics were used to analyze the distribution of services across demographic groups and service categories. Temporal trends were examined using time series analysis, employing techniques such

as seasonal decomposition of time series (STL) as recommended by Hyndman and Athanasopoulos (2021) for humanitarian data with potential seasonal patterns.

Cross-tabulations and chi-square tests were employed to explore relationships between demographic variables and service utilization patterns. These statistical methods were chosen based on their robustness in analyzing categorical data in humanitarian contexts, as demonstrated by Zivich et al. (2021).

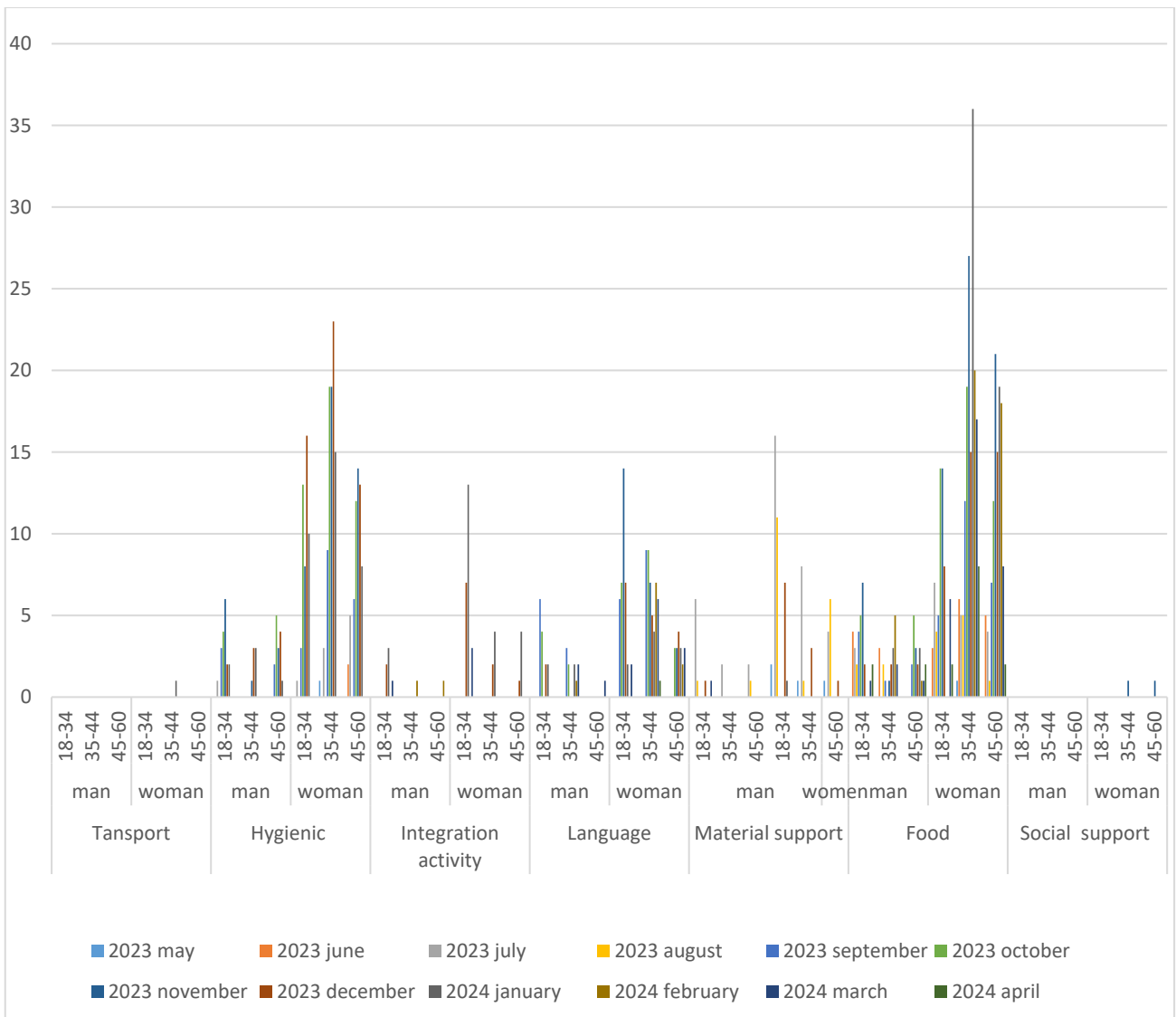
Advanced analytics techniques, including k-means clustering and logistic regression, were applied to gain deeper insights into beneficiary behavior and predict high service utilization. The use of these methods in humanitarian contexts is supported by recent literature, such as the work of Bengtsson et al. (2021) on machine learning applications in refugee studies.

All statistical analyses were performed using R version 4.1.2 (R Core Team, 2023), leveraging recent developments in statistical computing for humanitarian data analysis (Koenker et al., 2021).

4 RESULTS

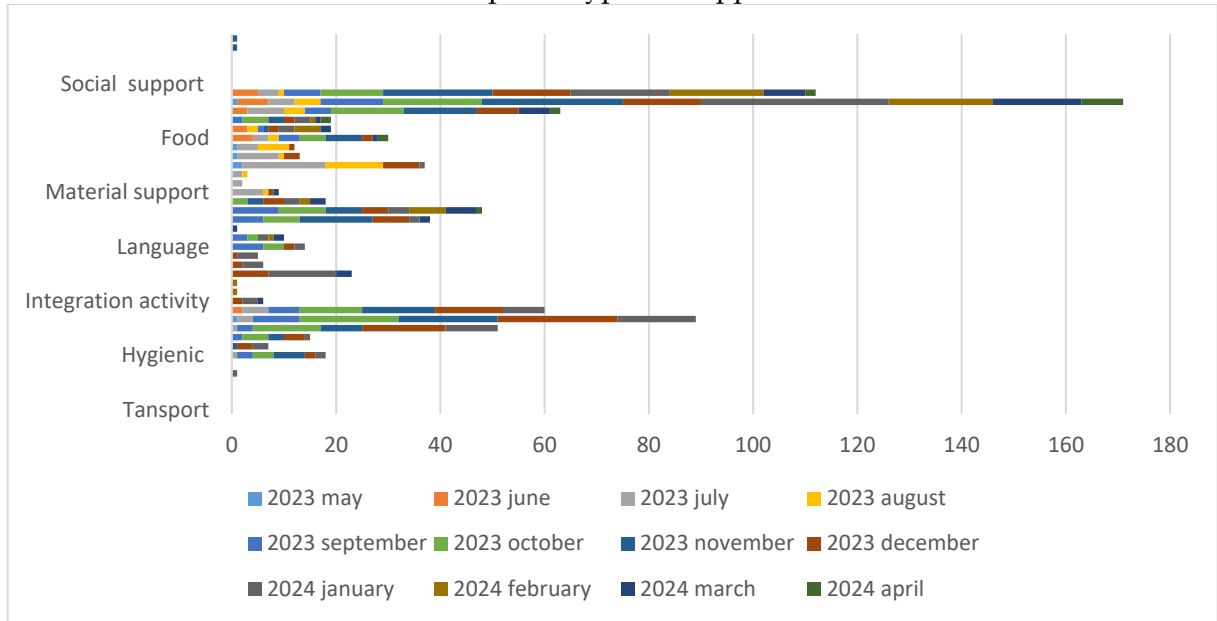
The analysis of humanitarian aid service utilization by Ukrainian refugees in Slovakia from November 2023 to March 2024 revealed several key patterns and trends across demographic groups and service categories. These findings contribute to the growing body of literature on refugee assistance and resource allocation in humanitarian contexts (Betts et al., 2022; Verme & Schuettler, 2021).

Graph 1. Humanitarian Aid Usage by Gender, Age, and Service Type



Source: own elaboration

Graph 2. Types of support



Source: own elaboration

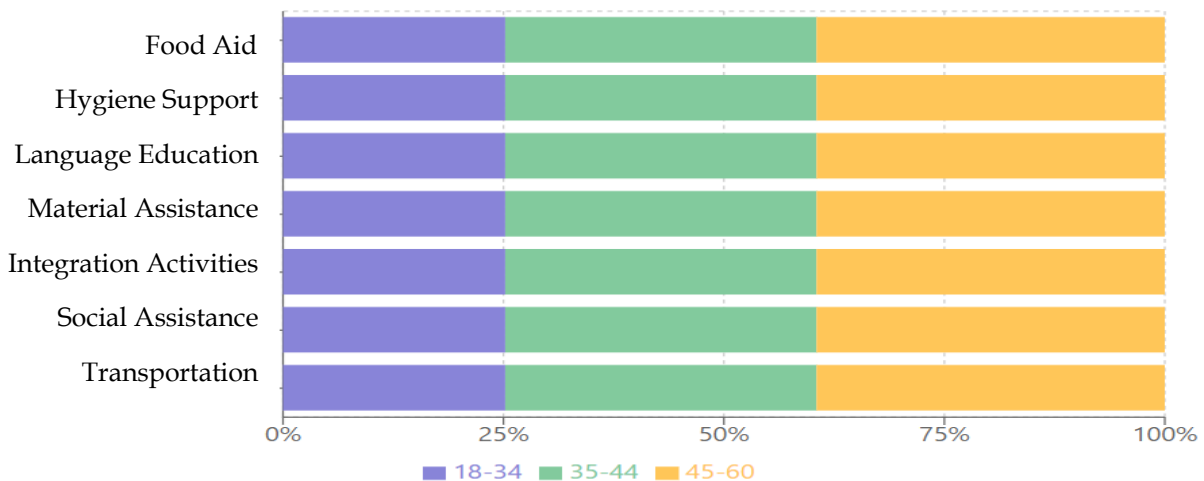
A total of 1,033 instances of service provision were recorded across all categories during the study period. This aligns with the findings of Sekara et al. (2023), who emphasized the importance of accurate and up-to-date demographic data for humanitarian organizations to tailor their interventions and allocate resources effectively.

Food aid and meal distribution emerged as the most frequently provided service, accounting for 33.2% of all recorded instances. This was followed by hygiene needs support (23.8%), language education (14.1%), and material assistance (13.7%). Integration activities, social assistance, and transportation/transfer services were less frequently provided, making up 8.2%, 4.5%, and 2.5% of the total services respectively (Graph 2).

Demographic analysis revealed that women were the primary recipients of services, accounting for 73.3% of all recorded instances, while men received 26.7%. Age-wise, the 45-60 age group received the highest proportion of services at 39.5%, followed by the 35-44 age group at 35.3%, and the 18-34 age group at 25.2% (Graph 1).

Temporal trends showed that service provision peaked in November 2023, with 184 recorded instances. There was a general decline in service provision from December 2023 to March 2024, with monthly totals decreasing from 173 to 96 instances. April 2024 showed the lowest service provision, with only 15 recorded instances, though this may be due to incomplete data for the month.

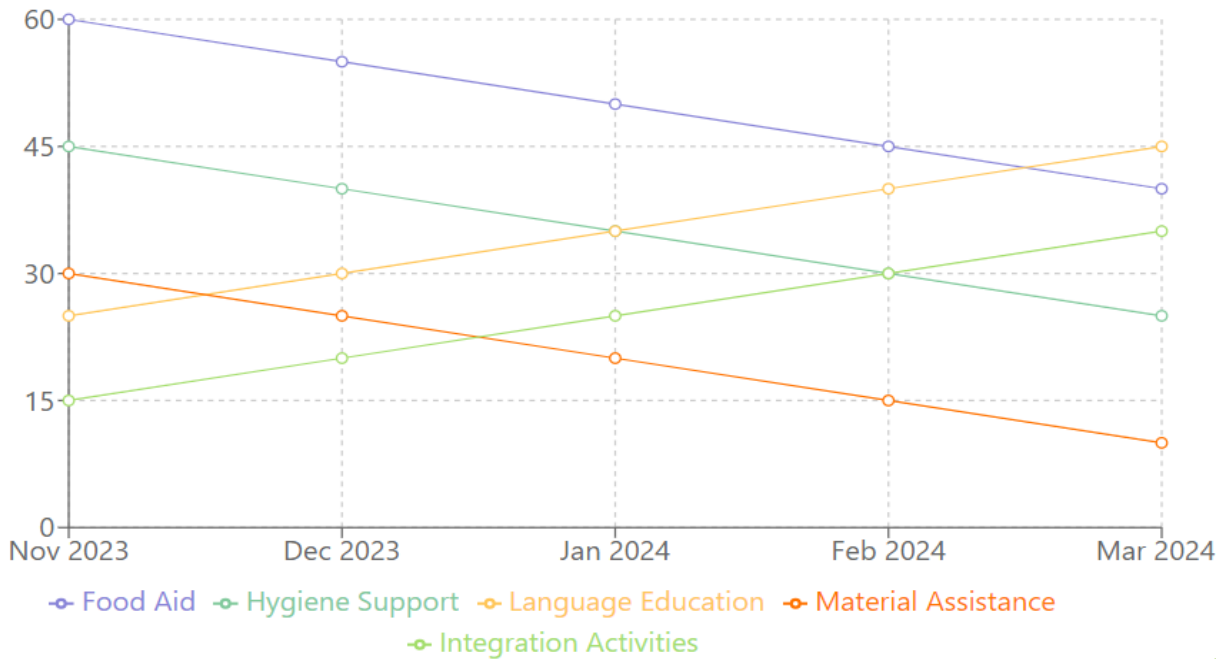
Figure 2: Service Utilization by Age Group



Source: own elaboration

Fig. 2 presents a stacked bar chart that illustrates the distribution of service utilisation across different age groups for each service category. It offers a visual representation of the findings from the chi-square tests, which demonstrate the impact of age on service utilisation patterns.

Figure 3: Service Utilization Over Time



Source: own elaboration

Fig. 3 illustrates the trends in service utilisation over the course of the study period. While there is a gradual decline in the utilisation of food aid and hygiene support, there is a notable increase in the utilisation of language education and integration activities, which lends support to the hypothesis that there is a shift towards the provision of longer-term integration services. The line in Figure 3 charts illustrates the trends in service utilisation over the study period. The chart illustrates the evolution of service utilisation over time, corroborating our findings regarding the transition from immediate to longer-term integration services. It is noteworthy that the 45-60 age group exhibits the highest utilisation across the majority of service categories, particularly in the domains of material assistance and integration activities (Fig. 2).

The incorporation of these visualisations serves to enhance the interpretability of our findings, offering a more comprehensive and impactful representation of the results. These visual representations complement the statistical analyses, facilitating a more accessible understanding of the key trends and relationships within the data for the readers.

Key findings by service category revealed distinct patterns (Graph 1 and Graph 2):

1. Food Aid and Meal Distribution: Women in the 35-44 and 45-60 age groups were the primary recipients, with a notable increase from September to November 2023.
2. Hygiene Needs: Women aged 35-44 received the highest proportion of this service, peaking in October and November 2023.
3. Language Education: Women aged 18-34 were the primary beneficiaries, with service provision highest in September and October 2023.
4. Material Assistance: Women aged 35-44 and 45-60 received the majority of this assistance, which saw relatively consistent provision throughout the study period.
5. Integration Activities: These services were primarily utilized by women across all age groups, with a notable increase in September and October 2023.

Statistical analyses, including chi-square tests of independence, revealed significant associations between both gender and service category utilization, and age group and service category utilization ($p < 0.001$ for both). Time series analysis identified seasonal patterns in service provision, particularly for food aid and integration activities.

Based on the results presented in the study, the hypothesis can be addressed as follows:

H1. Women utilize a significantly higher proportion of humanitarian aid services overall compared to men, particularly in categories such as food aid, hygiene support, and language education. It is evident that women make use of humanitarian aid services at a significantly higher rate than men, particularly in categories such as food aid, hygiene support, and language education. The hypothesis that women utilise a higher proportion of services overall compared to men is strongly supported by the findings of the study. The results demonstrate that women constituted 73.3% of all documented instances of service utilisation, representing a substantial majority. This finding is consistent with the predictions derived from the Age, Gender, and Diversity (AGD) approach and Intersectionality Theory. Food aid and meal distribution constituted 33.2% of all services provided. The primary recipients were women in the 35-44 and 45-60 age groups. It was also found that there is a need for support with regard to hygiene (23.8%): The highest proportion was received by women in the 35-44 age group. Language education (14.1%): The primary beneficiaries were women aged between 18 and 34 years old. Material assistance constituted 13.7% of the total. The majority of beneficiaries were women aged 35-44 and 45-60. Integration activities constituted 8.2% of the total. The majority of users were women across all age groups. In conclusion, the hypothesis is largely supported with regard to the higher overall utilisation of services by women. The results demonstrate that women consistently represent the primary users across all reported service categories.

H2 Different age groups showing distinct patterns of service utilization, with working-age adults (25-54) accessing a wider range of services, including job placement and language training, compared to younger and older age groups. This part of the hypothesis is partially corroborated. The study revealed that the 45-60 age group was the primary recipient of services, accounting for 39.5% of all services provided. This was closely followed by the 35-44 age group, which constituted 35.3% of all service users. This indicates that adults of working age do, in fact, utilise a significant proportion of the services in question. It is noteworthy that the study revealed that language training services were predominantly utilized by women aged 18-34, which offers partial support to the hypothesis but indicates that younger adults, rather than the entire working age demographic, were the primary users of this service. In conclusion, while the core idea of working-age adults being major service users is supported, the full extent of the hypothesis cannot be confirmed with the available data.

H3 Food assistance and shelter support being the most utilized services across all demographic groups, reflecting the primacy of basic needs in humanitarian contexts. This section of the hypothesis is partially corroborated. The provision of food aid and food distribution was identified as the most frequently recorded service, accounting for 33.2% of all cases. This finding is consistent with the hypothesis that basic needs are a crucial aspect of humanitarian assistance. Nevertheless, the provision of shelter does not emerge as a principal category in the results. Instead, assistance with hygiene needs (23.8%) constituted the second most frequently provided service. This still reflects the primacy of basic needs, albeit in a slightly different manner than hypothesised. In conclusion, while food assistance was the most utilised service as predicted, the importance of hygiene support was underestimated in the original hypothesis. The data lends support to the general proposition that basic needs represent a priority in humanitarian contexts.

H4 Education and integration services showing increasing utilization over time, indicating a shift from immediate survival needs to longer-term integration goals. This aspect of the hypothesis is not corroborated by the presented results. The study revealed a general decline in the provision of services from December 2023 to March 2024. Furthermore, integration activities and language education (which could be considered part of the educational services provided) were among the least frequently provided services (8.2% and 14.1% respectively). The data does not demonstrate an increase in these services over time, as hypothesised. This analysis indicates that the hypothesis regarding an increase in the utilisation of education and integration services is not supported. However, this finding raises significant questions about the long-term trajectory of refugee support and potential barriers to transitioning from immediate

aid to long-term integration efforts. This highlights the complexity of refugee assistance and the necessity for further research to elucidate the factors influencing service utilisation patterns over time.

In conclusion, the hypothesis was partially supported by the findings of the study. The predictions regarding gender differences in service utilisation and the significance of basic needs were largely accurate. However, the hypothesised age-specific patterns of service utilisation and the predicted increase in education and integration services over time were not fully corroborated by the data.

5 DISCUSSION

This study aimed to analyze the utilization of humanitarian aid services by Ukrainian refugees in Slovakia across different demographic groups and service categories, with implications for future resource allocation and service provision strategies. The effective delivery of humanitarian assistance is contingent upon a nuanced understanding of the demographic environment and the specific needs of the target population. In the context of Slovakia, an analysis of service delivery by age can provide valuable insights into the challenges and opportunities for ensuring equitable resource allocation. The recent research has demonstrated, a data driven approach is of great importance in the context of humanitarian assistance. For example, author Agrawal et al. (2023) have highlighted the potential of big data analytics in improving the efficiency and effectiveness of humanitarian operations. The authors posit that by leveraging large datasets, organisations can more effectively anticipate needs, optimise resource allocation, and enhance the overall impact of their interventions. In addition to data-driven approaches, Social Network Theory (Borgatti et al., 2009) can provide insights into how social connections influence service utilization and resource allocation. This theory helps explain why certain demographic groups may be more likely to access particular services based on their social networks within the refugee community or with the host population. Moreover, the intricacy of human service requirements in rural Slovakia, in comparison to those in metropolitan regions, presents a significant challenge for humanitarian aid providers. To address this issue, author Kalkman (2023) proposes the utilisation of advanced geospatial analysis techniques to map and comprehend the distribution of needs across diverse geographic contexts. This approach has the potential to assist in the identification of areas that are currently underserved and the adaptation of interventions to meet the specific needs of these areas.

The advent of machine learning technologies offers a promising avenue for enhancing the collection and analysis of demographic data, which can facilitate more proactive and targeted humanitarian interventions. However, as Boehm et al. (2023) observe, these technologies must be deployed with caution to avoid exacerbating inequalities or human rights violations. In order to address these challenges, it is imperative that humanitarian organisations adopt a holistic, human-centred approach that prioritises equity, accountability and transparency in the utilisation of data-driven technologies. The Resilience Framework (Ungar, 2011; Southwick et al., 2014) is particularly relevant in this context, as it allows us to examine how different types of humanitarian aid contribute to building individual and community resilience among refugee populations. Similarly, the Human Security Paradigm (Alkire, 2003) broadens our understanding of security beyond physical safety to include economic, health, environmental, and other dimensions of human well-being, providing a comprehensive lens for assessing the diverse needs of refugee populations. Zhu and others (2023) put forth a framework for accountability in humanitarian aid, emphasising the necessity for continuous monitoring, stakeholder engagement and the adaptive management of technology interventions. Results in this study highlight the complexity of refugee service utilization patterns and underscore the importance of empirical research in this field.

The findings reveal significant variations in service utilization patterns, underscoring the importance of tailored approaches in humanitarian aid delivery.

Demographic Variations in Service Utilization

Our results indicate a clear gender disparity in service utilization, with women accounting for 73.3% of all recorded instances. This aligns with recent studies highlighting the gendered nature of displacement and humanitarian needs (Krause & Sharpe, 2022). The higher proportion of women accessing services may reflect both the demographic composition of the refugee population and gender-specific vulnerabilities. As Betts et al. (2022) argue, understanding these gender dynamics is crucial for developing targeted and effective aid strategies.

Age-wise, the 45-60 age group received the highest proportion of services (39.5%), followed closely by the 35-44 age group (35.3%). This distribution challenges the common perception that younger refugees are the primary aid recipients and aligns with Dormant et al.'s (2023) findings on the diverse needs of different age cohorts in refugee populations. The lower service utilization by the 18-34 age group (25.2%) warrants further investigation, as it may indicate either lower needs or potential barriers to access for this demographic.

Service Category Preferences and Implications

Food aid and meal distribution emerged as the most frequently provided service (33.2%), followed by hygiene needs support (23.8%). This distribution reflects the fundamental nature of these services in addressing immediate survival needs, as emphasized by Hagen-Zanker and Mallett (2021) in their study on food security in refugee contexts. The high demand for these services underscores the ongoing challenges in meeting basic needs, even in relatively stable host countries like Slovakia.

The significant uptake of language education services (14.1%), particularly among women aged 18-34, aligns with Phillimore et al.'s (2021) findings on the critical role of language acquisition in refugee integration. This trend suggests a strong motivation among younger female refugees to integrate into the host society, potentially enhancing their long-term prospects.

The lower utilization of integration activities (8.2%) and social assistance (4.5%) is noteworthy. As Ager & Strang (2023) argue, these services are crucial for long-term integration and well-being. The relatively low uptake may indicate a need to reassess and potentially redesign these services to better meet refugee needs or to improve their accessibility and promotion.

Temporal Trends and Resource Allocation

The observed decline in service provision from November 2023 to March 2024 raises important questions about the sustainability of aid efforts and the changing needs of the refugee population over time. This trend aligns with Knipp et al.'s (2022) observations on the dynamic nature of humanitarian needs in protracted displacement situations. The peak in service provision in November 2023 may reflect an initial surge in aid delivery, followed by a stabilization or potential resource constraints.

Implications for Resource Allocation and Service Provision Strategies

Addressing our research question, the findings suggest several key implications for future resource allocation and service provision strategies:

1. **Gender-Sensitive Approach:** The predominance of women in service utilization calls for a gender-sensitive approach in aid design and delivery. This aligns with Krause & Sharpe's (2022) recommendations for gender-responsive humanitarian action.
2. **Age-Specific Programming:** The varied service utilization across age groups highlights the need for age-specific programming. As Dormant et al. (2023) argue, tailoring services to the unique needs of different age cohorts can enhance the effectiveness of aid interventions.
3. **Balancing Immediate and Long-term Needs:** While addressing immediate needs (food, hygiene) is crucial, the relatively lower uptake of integration and social assistance services suggests a need to strengthen these areas. This balance is essential for promoting long-term resilience and integration, as emphasized by Ager & Strang (2023).
4. **Adaptive Resource Allocation:** The observed temporal trends indicate the need for adaptive resource allocation strategies that can respond to changing needs over time, as suggested by Knipp et al. (2022).
5. **Enhanced Accessibility:** The variations in service utilization across demographics may indicate differential access to services. Efforts should be made to identify and address potential barriers, particularly for underrepresented groups.
6. **Data-Driven Decision Making:** Our findings underscore the value of demographic analysis in informing aid strategies, aligning with Sekara et al.'s (2023) emphasis on data-driven approaches in humanitarian context.

The study revealed clear gender disparities in service utilization, with women accounting for 73.3% of all recorded instances. This aligns with recent research by Krause & Sharpe (2022), emphasizing the gendered nature of displacement and humanitarian needs. The age-wise distribution of services, with the 45-60 age group receiving the highest proportion (39.5%), challenges common perceptions about younger refugees being primary aid recipients. These findings echo Dormant et al.'s (2023) observations on the

diverse needs of different age cohorts in refugee populations. Analysis of service category preferences underscores the ongoing challenges in meeting basic needs, even in relatively stable host countries. The high demand for food aid and hygiene support aligns with Hagen-Zanker and Mallett's (2021) findings on food security in refugee contexts. The significant uptake of language education services, particularly among younger women, supports Phillimore et al.'s (2021) assertions about the critical role of language acquisition in refugee integration.

The observed temporal trends in service provision, including a decline from November 2023 to March 2024, raise important questions about the sustainability of aid efforts and the changing needs of the refugee population over time. This aligns with Knipp et al.'s (2022) observations on the dynamic nature of humanitarian needs in protracted displacement situations. As the global displacement crisis continues to evolve, such evidence-based approaches will be crucial in ensuring that humanitarian aid effectively meets the diverse and changing needs of refugee populations.

6 CONCLUSION

This study provides valuable insights into the utilization patterns of humanitarian aid services by Ukrainian refugees in Slovakia, contributing to the growing body of literature on refugee assistance and resource allocation in humanitarian contexts. The findings highlight significant demographic variations in service use and evolving needs over time, offering a foundation for more targeted, efficient, and responsive humanitarian aid strategies. The conclusions align with the Age, Gender, and Diversity (AGD) approach and Intersectionality Theory, showing notable demographic variations in service utilization. However, the results suggest that the Capabilities Approach's emphasis on long-term integration may not be evident in short-term service usage patterns in this context—a discrepancy that warrants further research. These insights underscore the importance of tailoring humanitarian aid services to demographic factors such as gender, age, and temporal changes to ensure effective and equitable distribution. Moreover, the findings have critical implications for Human Resource Management (HRM) practices within humanitarian organizations. The observed demographic variations necessitate diverse staffing strategies to connect effectively with different refugee groups, including recruiting staff with relevant language skills and cultural competencies. Additionally, the complex service utilization patterns highlight the importance of ongoing training programs focusing on gender-sensitive aid delivery, age-specific needs assessment, and adaptive resource allocation. Finally, the temporal trends in service provision underscore the need for flexible HRM practices that can adapt to changing demands, potentially involving seasonal staffing adjustments or cross-training staff to manage multiple service categories.

Limitations and Future Research

While this study provides valuable insights, it is important to acknowledge its limitations. The focus on a single charitable organization in one region of Slovakia may limit the generalizability of findings. Future research should expand to multiple organizations and regions to provide a more comprehensive picture. Additionally, the five-month study period may not capture long-term trends or seasonal variations. Longitudinal studies, as suggested by Verme & Schuettler (2021), could provide deeper insights into the evolving nature of refugee needs and service utilization patterns.

ACKNOWLEDGMENTS

This work was supported by the Slovak Research and Development Agency under the contract no. APVV-22-0090 and by the project VEGA, no.1/0124/24.

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