

INCOME AND CONSUMPTION INEQUALITIES AMONG OLDER HOUSEHOLDS IN POLAND AND THEIR IMPLICATIONS FOR ACTIVE AGEING

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ABSTRACT

Background. Population ageing generates important social, economic and health consequences. Economic conditions are key social determinants of health and quality of life in old age. Income alone does not fully reflect living standards of older adults; consumption patterns provide complementary information on actual resource use and opportunities for social participation.

Objective. The aim of the study was to assess income and consumption inequalities among households of individuals aged 60 years or older in Poland and to identify distinct consumption profiles and their socio-economic determinants, with implications for active ageing and public health.

Material and Methods. The analysis was based on microdata from the 2024 Household Budget Survey conducted by Statistics Poland. The analytical sample comprised 12,211 households in which the reference person was aged 60 years or older. Inequality was measured using the Gini coefficient, Atkinson index, Hoover index, Coulter index and Theil indices for equivalised disposable income and selected COICOP expenditure categories. Hierarchical and k-means cluster analysis identified consumption patterns. Binary logistic regression models examined factors associated with cluster membership.

Results. Income inequality was moderate. Consumption inequality was substantially higher, particularly for discretionary categories such as miscellaneous goods and services, household furnishings, recreation and culture, restaurants and hotels and transport. Three clusters were identified: low-income basic consumption households, balanced middle-income consumption households and an exploratory high-income outlier cluster. Higher equivalised disposable income and tertiary education increased the odds of diversified consumption patterns, whereas older age and larger household size were associated with expenditure concentrated on basic needs.

Conclusions. Moderate income inequality coexists with pronounced consumption inequalities among older households in Poland. Economic differences are expressed primarily through the ability to satisfy higher-order needs related to mobility, leisure and social participation. Assessments of well-being in later life and policies supporting healthy and active ageing should therefore consider both income and consumption patterns.

Keywords: *quality of life, socioeconomic factors, older adults, active ageing, income inequality, household expenditure, consumption inequality*

INTRODUCTION

Population ageing is one of the major demographic challenges facing contemporary societies. In Poland, as in most European countries, both the number and proportion of individuals aged 60 years and older are steadily increasing, generating important social, economic, and health consequences. Economic conditions are recognized as key social determinants of health, influencing not only the ability to meet basic needs but also social participation, access to healthcare, and overall quality of life in old age.

Household income is one of the primary determinants of economic well-being among older adults. However, income alone does not fully reflect actual living conditions. Increasing attention has therefore been paid to consumption as a complementary measure of economic inequality, as it reflects the current use of available financial resources [1]. This is particularly relevant for older populations, whose consumption may be financed not only by current income but also by accumulated savings, assets, and family or social transfers [2, 3].

The relationship between income and consumption is well established in economic theory. According to

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Engel's law, households with higher incomes allocate a smaller share of their budget to basic necessities and a larger share to higher-order goods and services. Similarly, the life-cycle hypothesis suggests that households attempt to smooth consumption over time by drawing on previously accumulated resources. Nevertheless, retirement is often associated with reduced labor income and increased reliance on savings and transfers, which may limit consumption opportunities for some households [4].

Previous studies indicate that older adults are a heterogeneous population characterized by substantial differences in economic resources and consumption patterns [5, 6]. These disparities may affect opportunities for social participation, active ageing, and quality of life. Consequently, identifying distinct consumption profiles and the factors associated with them may improve understanding of economic inequalities among older adults and their potential public health implications. Although previous studies have examined either income inequality or consumption patterns among older adults, relatively few have analysed these dimensions simultaneously within a single nationally representative dataset. Moreover, most existing studies focus primarily on average expenditure levels or poverty indicators, providing limited evidence on the heterogeneity of consumption profiles and their relationship with economic inequality. By combining multiple inequality measures with cluster analysis and logistic regression, the present study offers a comprehensive assessment of both the magnitude and structure of economic inequalities among older households in Poland. This integrated approach provides new evidence on how differences in income, expenditure patterns, and socio-economic characteristics are associated with distinct consumption profiles relevant to active ageing and public health.

The aim of this study was to provide a comprehensive assessment of income and consumption inequalities among households of individuals aged 60 years or older by combining multiple inequality measures, cluster analysis, and logistic regression using nationally representative Household Budget Survey data from Poland. We hypothesized that inequalities in quality of life among older households are more strongly reflected by consumption inequalities than by income inequalities. To address this objective, inequality measures, cluster analysis, and logistic regression models were applied to examine the relationships between economic resources and consumption patterns in later life.

MATERIALS AND METHODS

The study was based on microdata obtained from the 2024 Household Budget Survey (HBS) conducted annually by Statistics Poland (GUS). The Household Budget Survey is a nationally representative survey designed to collect detailed information on household income, expenditure, consumption, housing conditions, and selected socio-demographic characteristics. Households are selected using a stratified two-stage sampling design to ensure representativeness at the national level.

Data is collected throughout the entire calendar year using standardized questionnaires and household expenditure diaries. Information includes disposable income, expenditures according to the COICOP classification (the Classification of Individual Consumption According to Purpose), household composition, education, labor market status, housing conditions, and material deprivation indicators.

The survey applies sampling weights provided by Statistics Poland to account for the sampling design and non-response, allowing estimates to be generalized to the population of Polish households.

For the present study, only households in which the household reference person was aged 60 years or older were included. After data selection, the analytical sample consisted of 12,211 households.

Analysis of income and expenditure inequalities

To assess the degree of economic differentiation among households of people aged 60 years and older, selected measures of income and expenditure inequality were applied. The analysis included the Gini coefficient, Atkinson index, Hoover index, Coulter index, and Theil indices (T and L). These measures enabled a multidimensional assessment of inequality by capturing both the overall dispersion of income and expenditures and the concentration of economic resources within the study population.

The Gini coefficient was used as the primary measure of inequality, reflecting the extent to which the distribution of income or expenditure deviates from perfect equality. The coefficient ranges from 0 to 1, where 0 indicates complete equality and 1 indicates maximum inequality. The Gini coefficient was calculated according to the following formula:

$$G = \frac{(\sum_{i=1}^n \sum_{j=1}^n |x_i - x_j|)}{2n^2\mu}$$

where:

x_i – denotes the income or expenditure of the i -th household,

μ – represents the mean income or expenditure,

n – denotes the number of observations.

The Atkinson index was employed to assess the social implications of economic inequality. This measure is particularly sensitive to disparities occurring among households with lower levels of income and therefore provides insight into the distributional consequences of inequality from a social welfare perspective. The Atkinson index was calculated using the following formula:

$$A = 1 - \frac{\left(\frac{1}{\sum_{i=1}^n x_i^{1-\varepsilon}} \right)^{\frac{1}{1-\varepsilon}}}{\mu}$$

where: ε – denotes the inequality aversion parameter, all other symbols are defined as above.

The Hoover index was used to quantify the proportion of total income or expenditure that should be redistributed to achieve perfect equality.

This measure reflects the extent of redistribution required to eliminate observed disparities within the population and was calculated according to the following formula:

$$H = \frac{1}{2} \sum_{i=1}^n \left| \frac{x_i}{\sum x_i} - \frac{1}{n} \right|$$

Additionally, the entropy-based Theil indices (T and L) were employed to assess both the magnitude and the structure of inequalities across the expenditure categories under investigation. These measures are particularly useful because they are sensitive to different parts of the distribution and allow for the decomposition of inequality into within-group and between-group components.

The Theil T index was calculated using the following formula:

$$T = \frac{1}{n} \sum_{i=1}^n \frac{x_i}{\mu} \ln \left(\frac{\mu}{x_i} \right)$$

while the Theil L index according to the formula:

$$L = \frac{1}{n} \sum_{i=1}^n \ln \left(\frac{\mu}{x_i} \right)$$

The Coulter index was applied as a complementary measure of relative economic inequality. This measure is based on the relationship between observed values and their deviations from the population mean, thereby providing an additional assessment of the degree of economic dispersion within the study population.

Inequality analyses were conducted for disposable income per capita and selected categories of household expenditure, including food, housing and

energy, transportation, health, recreation, and other consumer expenditures. To improve comparability across households of different sizes, all income and expenditure measures were expressed on a per-capita basis.

Cluster analysis

Hierarchical agglomerative cluster analysis was conducted using Ward's method, which minimizes the increase in within-cluster error sum of squares (ESS) and produces homogeneous, well-separated clusters. Cluster solutions ranging from two to seven groups were evaluated using the silhouette index, pseudo-F statistic, and cubic clustering criterion (CCC).

The three-cluster solution demonstrated the best overall performance, achieving the highest silhouette index (0.905), which indicated excellent separation and high within-cluster homogeneity (Table 1). Although the pseudo-F statistics and CCC suggested some improvement for solutions with a larger number of clusters, the marked decline in the silhouette index beyond three clusters indicated reduced quality and stability. Therefore, the three-cluster solution was selected as the optimal and most interpretable classification.

Subsequently, k-means clustering with Euclidean distance was applied, specifying three clusters based on the hierarchical analysis results. The analysis included standardized household expenditures across major COICOP categories: food and non-alcoholic beverages, housing and energy, health, transport, communication, recreation and culture, restaurants and hotels, and miscellaneous goods and services.

After cluster identification, socio-economic differences between clusters were examined, including income, demographic characteristics, educational attainment, material living conditions, and household deprivation.

Analysis of factors associated with cluster membership

To identify factors associated with household membership in the identified clusters, logistic regression models were estimated. A separate binary logistic regression model was constructed for each cluster, with cluster membership coded as 1 for households belonging to a given cluster and 0 for all remaining households.

The models included socio-demographic and economic variables comprising: size of place of residence, educational attainment of the household reference person, marital status, household size, age of the household reference person, and the natural logarithm of disposable income per capita.

Regression results were presented as odds ratios (ORs) with corresponding 95% confidence intervals

(95% CIs). Model performance was evaluated using the Likelihood Ratio Test, Cox-Snell and Nagelkerke pseudo- R^2 coefficients, the Hosmer-Lemeshow goodness-of-fit test, and the area under the receiver operating characteristic curve (AUC). Additionally, multicollinearity among explanatory variables was assessed using the Variance Inflation Factor (VIF). Statistical significance was established at $p < 0.05$.

RESULTS

Income and consumption inequalities among households of individuals aged 60 years and older

The analysis of income inequality showed that the Gini coefficient for equivalised disposable income was 0.250. The Atkinson index equalled 0.116, whereas the Hoover index was 0.173. The Theil indices reached 0.127 (Theil T) and 0.124 (Theil L).

The analysis demonstrated substantial differences in consumption inequality across individual expenditure categories (Figure 1). The lowest level of

inequality was observed for expenditures on food and non-alcoholic beverages (Gini coefficient = 0.222), as well as for total consumption expenditure and total expenditure per capita.

A moderate level of inequality was observed for expenditures on housing and energy (Gini coefficient = 0.375) and communication services (Gini coefficient = 0.360).

The highest levels of inequality were recorded for expenditures on miscellaneous goods and services (Gini coefficient = 0.679), household furnishings and equipment (Gini coefficient = 0.643), recreation and culture (Gini coefficient = 0.631), education (Gini coefficient = 0.612), restaurants and hotels (Gini coefficient = 0.610), transport (Gini coefficient = 0.606), and clothing and footwear (Gini coefficient = 0.598). Elevated values of the Atkinson, Hoover, and Theil indices for these expenditure categories also indicated a strong concentration of expenditures among selected groups of households.

Table 1. Cluster validity statistics for hierarchical clustering (Ward's method)

Number of clusters	Cubic clustering criterion (CCC)	Pseudo F statistic	Silhouette index
2	-66.7019868	780.418788	0.901565334
3	-60.4078935	812.247353	0.904690701
4	-44.5001560	846.212763	0.278476568
5	-38.5859032	812.990902	0.277694739
6	-25.9961672	807.017339	0.286139617
7	-10.3873853	811.261723	0.284052152

Source: Author's calculations based on the Household Budget Survey microdata.

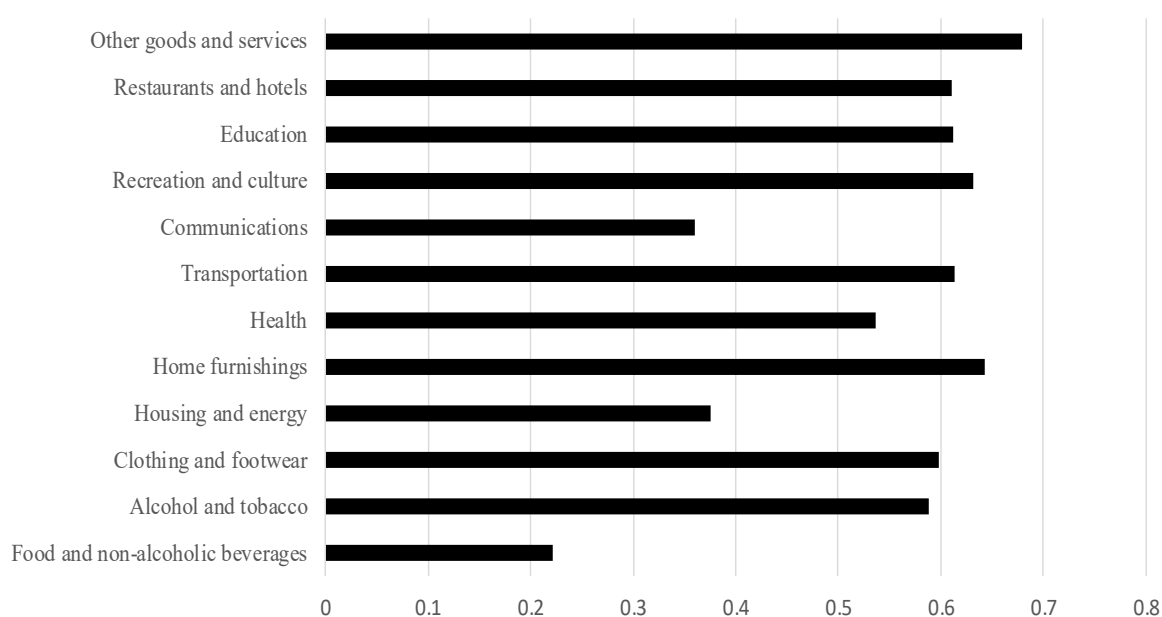


Figure 1. Differences in consumption inequality across expenditure categories among households of individuals aged 60 years and older, Poland, 2024 (Gini coefficients)

Source: Authors' own calculations based on the 2024 Household Budget Survey microdata (Statistics Poland).

Consumption patterns across household clusters among individuals aged 60 years and older

The clustering procedure identified three distinct household clusters among households of individuals aged 60 years and older (Table 2).

Cluster 1 “low-income basic consumption households” comprised 8,633 households (69.39%) and represented the largest household cluster in the study population. This cluster was characterized by the lowest level of equivalised disposable income (3,108.7) and a consumption pattern concentrated primarily on basic needs, particularly food as well as housing and energy expenditures. Households in this cluster also exhibited relatively low levels of material deprivation: 61.68% experienced no deprivation, whereas the remaining households were predominantly classified as having low or moderate levels of deprivation.

Expenditures in the remaining consumption categories were substantially lower than in the other household clusters.

This household cluster also displayed the oldest age structure, with a mean age of 71.2 years, and a relatively high proportion of household reference persons aged over 70 years (53.64%).

The socio-economic profile of this household cluster was dominated by pensioner households (85.94%), with only a small proportion of economically active individuals. Educational attainment was relatively

lower than in the other household clusters, with the largest proportions represented by individuals with secondary education (36.70%) and vocational education (33.75%), whereas the proportion of individuals with tertiary education was comparatively low (15.17%).

To identify factors associated with membership in the low-income basic consumption households cluster, a binary logistic regression model was estimated. The model was statistically significant overall (likelihood ratio $\chi^2 = 1459.98$; $p < 0.001$), and the goodness-of-fit measures indicated satisfactory explanatory performance (Nagelkerke $R^2 = 0.159$; Cox-Snell $R^2 = 0.113$). The Hosmer-Lemeshow test revealed no significant differences between observed and predicted values ($\chi^2 = 11.93$; $p = 0.155$), confirming adequate model fit. Furthermore, the area under the ROC curve (AUC = 0.712) indicated good discriminatory ability. Multicollinearity diagnostics revealed no estimation problems (all VIF values < 1.5).

Several demographic and economic variables were significantly associated with membership in Cluster 1.

The strongest predictor was household size (OR = 2.84; 95% CI: 2.63–3.06; $p < 0.001$). Each additional household member increased the odds of belonging to Cluster 1 by nearly threefold.

The age of the household reference person was also a significant predictor. Each additional year of

Table 2. Socio-economic and consumption profiles of k-means clusters (households aged 60+)

Characteristic	Cluster 1: Basic consumption (69.39%)	Cluster 2: Balanced consumption (30.46%)	Cluster 3: High-income outliers (0.15%)
Share of sample (%)	69.39	30.46	0.15
Number of cases	8,633	3,790	19
Disposable income per capita (PLN)	3,108.7	3,851.4	6,134.1
Average age (household reference person) (years)	71.21	69.93	68.16
Household size	1.82	1.44	1.74
Unemployment rate (mean)	0.046	0.010	0.000
Persons with disability (mean)	0.227	0.145	0.316
Dominant economic status (%)	Retirees (85.94)	Retirees (84.33)	Retirees (73.68)
Male share (%)	55.87	46.97	57.89
Age 60-70 (%)	46.36	52.93	63.16
Age 70+ (%)	53.64	47.07	36.84
Higher education (%)	15.17	23.54	52.63
Basic consumption profile	Yes (dominant)	Moderate	No (diversified/high)
Deprivation – no deprivation (%)	61.68	49.26	84.21
Deprivation – medium/high (%)	38.32	50.74	15.79

Source: Author's calculations based on the Household Budget Survey microdata.

age increased the odds of belonging to Cluster 1 by approximately 4.4% (OR = 1.044; $p < 0.001$).

In contrast, disposable income was negatively associated with Cluster 1 membership. An increase in the natural logarithm of disposable income significantly reduced the likelihood of belonging to this household cluster (OR = 0.444; 95% CI: 0.401-0.493; $p < 0.001$).

Several socio-demographic characteristics were also significantly associated with Cluster 1 membership. Households headed by single individuals were more likely to belong to Cluster 1 than households headed by married individuals (OR = 1.40; $p < 0.001$).

Educational attainment exerted a protective effect. Possessing tertiary education reduced the likelihood of belonging to Cluster 1 by approximately 29% (OR = 0.712; $p < 0.001$).

Place of residence was also significantly associated with Cluster 1 membership. Compared with residents of the largest cities, households located in cities with 100,000-199,999 inhabitants were less likely to belong to Cluster 1 (OR = 0.753; $p < 0.001$), as were households residing in cities with 20,000-99,999 inhabitants (OR = 0.812; $p < 0.001$) and rural areas (OR = 0.756; $p < 0.001$).

Cluster 2 “balanced middle-income consumption households” comprised 3,790 households (30.46%) and represented the second largest household cluster, characterized by a relatively high level of equivalised disposable income (3,851.4) and a balanced consumption pattern.

Regarding educational attainment, this household cluster was dominated by individuals with secondary education (38.84%) and vocational education (27.18%), whereas the proportion of individuals with tertiary education was relatively high (23.54%). The age structure was balanced, with 52.93% of household reference persons aged 60-70 years and 47.07% aged over 70 years. The household cluster was composed predominantly of married and widowed individuals. The level of material deprivation was moderate: 49.26% of households reported no deprivation, whereas the remaining households were primarily classified as experiencing low or moderate levels of deprivation.

With respect to the consumption pattern, households in this cluster exhibited moderate but stable expenditure levels across all expenditure categories, with food and housing and energy accounting for the largest shares of total household expenditure.

To identify factors associated with membership in the balanced middle-income consumption households cluster, a binary logistic regression model was estimated. The model was statistically significant overall (likelihood ratio $\chi^2 = 1443.71$; $p < 0.001$), and the goodness-of-fit measures indicated satisfactory

explanatory performance (Nagelkerke $R^2 = 0.158$; Cox-Snell $R^2 = 0.112$). The Hosmer-Lemeshow test showed no significant differences between observed and predicted values ($\chi^2 = 11.48$; $p = 0.176$), confirming adequate model fit. The model also demonstrated good discriminatory ability (AUC = 0.711), and multicollinearity diagnostics indicated no estimation problems (all VIF values < 1.5).

Several socio-demographic and economic variables were significantly associated with membership in Cluster 2.

Disposable income was the strongest predictor of membership in this household cluster. An increase in the natural logarithm of disposable income more than doubled the odds of belonging to Cluster 2 (OR = 2.21; 95% CI: 2.00-2.45; $p < 0.001$).

Educational attainment also played a significant role. Possessing tertiary education increased the likelihood of belonging to Cluster 2 by approximately 39% (OR = 1.39; $p < 0.001$).

Place of residence was significantly associated with Cluster 2 membership. Compared with residents of the largest cities, households located in cities with 100,000-199,999 inhabitants were more likely to belong to Cluster 2 (OR = 1.33; $p < 0.001$), as were households residing in cities with 20,000-99,999 inhabitants (OR = 1.24; $p < 0.001$) and rural areas (OR = 1.33; $p < 0.001$).

In contrast, age and household size were negatively associated with Cluster 2 membership. Each additional year of age of the household reference person reduced the odds of belonging to this household cluster by approximately 4.2% (OR = 0.958; $p < 0.001$). Similarly, each additional household member decreased the odds of membership by approximately 65% (OR = 0.35; $p < 0.001$).

Marital status was also a significant predictor. Households headed by single individuals were less likely to belong to Cluster 2 than households headed by married individuals (OR = 0.71; $p < 0.001$).

Cluster 3 “exploratory high-income consumption outliers” comprised 19 households (0.15%) and was characterized by the highest level of equivalised disposable income (6,134.1). This household cluster exhibited exceptionally high expenditure levels across all expenditure categories, particularly housing and energy, communication, and miscellaneous goods and services.

The socio-economic profile of this household cluster was characterized by a predominance of individuals with tertiary education (52.63%), whereas the proportions of individuals with vocational and secondary education were comparatively lower. In demographic terms, household reference people aged 60-70 years constituted the majority of the cluster (63.16%), and no unemployment was observed among

household members. The level of material deprivation was very low, with 84.21% of households reporting no deprivation.

Because this household cluster comprised only 19 households (0.15% of the analytical sample), it should be regarded as an exploratory cluster rather than a distinct population segment.

The logistic regression results for Cluster 3 should be interpreted with caution because of the very small cluster size ($n = 19$), which resulted in numerical estimation problems, including an ill-conditioned matrix. Consequently, the estimated parameters should be regarded as exploratory rather than stable estimates of population-level associations.

Despite these limitations, higher equivalised disposable income remained significantly associated with an increased likelihood of belonging to Cluster 3 ($OR = 5.89$; $p < 0.001$).

In addition, secondary education was associated with a lower probability of membership in this household cluster ($OR = 0.18$; $p = 0.022$).

No other statistically significant associations were identified.

DISCUSSION

The results indicate that households of individuals aged 60 years and older are characterized by a moderate level of income inequality. The Gini coefficient for equivalised disposable income (0.250) was lower than that typically observed in the general population, confirming the stabilizing role of pension systems and social transfers in reducing economic disparities in older age. At the same time, relatively low Atkinson and Theil indices suggest that income inequality is not driven solely by extreme values but has a more even distributional pattern. This finding indicates that the income situation of older households is relatively stable; nevertheless, moderate economic disparities remain present, and a proportion of households may still experience financial constraints and an increased risk of economic deprivation. The relatively low values of the Atkinson and Theil indices also suggest that income inequality is distributed relatively evenly across the population rather than being driven exclusively by extremely high- or extremely low-income households.

Despite moderate income inequality, substantially higher consumption inequality was observed across expenditure categories. The greatest disparities concerned expenditures on recreation, transport, restaurants, housing equipment, and other goods and services, whereas the lowest were recorded for food, housing, and energy [7-10]. These findings are consistent with Engel's law, according to which lower-income households prioritize basic goods, whereas

rising income enables increased consumption of higher-order goods [11]. The markedly lower inequality observed for food and housing expenditures compared with discretionary expenditure categories indicates that the greatest differences among older households concern the consumption pattern rather than the overall level of spending. Expenditures associated with higher-order needs, lifestyle, mobility, leisure activities, and discretionary consumption were considerably more differentiated than expenditures related to basic needs. Particularly pronounced inequalities in recreation, restaurants and hotels, and transport suggest substantial variation in the opportunities of older households to participate in social and leisure activities. Likewise, disparities in household furnishings and miscellaneous goods and services reflect differences in material living standards and available economic resources. These findings suggest that, despite relatively stable income sources, older households differ considerably in their ability to satisfy higher-order needs and maintain active participation in social and consumer life, which is particularly relevant from the perspective of active ageing.

Cluster analysis confirmed substantial heterogeneity among older households. Two main household clusters, encompassing nearly the entire study sample, were identified: households with a basic consumption pattern and those with a more diversified consumption pattern. Additionally, an exploratory high-income household cluster comprising only 19 households was identified. Owing to its very small size, this household cluster should be regarded as exploratory rather than as a stable population segment, and its characteristics should be interpreted with caution. These results confirm that older adults are not a homogeneous economic group, consistent with research on diversity in ageing processes [12-14]. The low-income basic consumption households cluster consisted predominantly of households with lower equivalised disposable income, older household reference persons, lower educational attainment, and expenditures concentrated on food, housing, and energy. In contrast, the balanced middle-income consumption households cluster was characterized by higher equivalised disposable income, a greater proportion of individuals with tertiary education, and a more diversified consumption pattern, indicating considerable heterogeneity in the economic circumstances of older households.

Logistic regression showed that the key determinants of household cluster membership were equivalised disposable income, educational attainment, age of the household reference person, and household size. Higher equivalised disposable income and tertiary education increased the likelihood of belonging to household clusters with more diversified consumption patterns,

whereas older age and larger household size were associated with a concentration of expenditures on basic goods. These findings align with human capital theory and life-cycle theory, emphasizing the role of accumulated lifetime resources in shaping later-life economic conditions, and are supported by recent empirical studies [15, 16]. The observed relationship between lower income and a greater concentration of expenditure on food, housing, and energy is also consistent with Engel's law, which predicts that households experiencing budget constraints allocate a larger proportion of their resources to essential goods while reducing discretionary expenditure. Similarly, the positive association between older age and membership in the low-income basic consumption households cluster may be interpreted within the framework of the life-cycle hypothesis proposed by Modigliani and Brumberg, according to which retirement and declining labor income encourage more conservative consumption patterns financed primarily by pensions and accumulated assets. The strong effect of household size is consistent with the concept of resource dilution and household budget constraints, as each additional household member increases competition for available financial resources and limits opportunities for more diversified consumption patterns. Furthermore, the protective effect of tertiary education supports the assumptions of human capital theory, indicating that higher educational attainment contributes to greater lifetime earnings, increased asset accumulation, and better economic conditions after retirement. Taken together, these findings indicate that inequalities among older adults extend beyond income inequality and include substantial disparities in the ability to finance discretionary consumption, participate in social life, and maintain a consumption pattern supportive of active ageing.

From a public health perspective, it is particularly important that the highest consumption inequalities were observed in expenditure categories related to social participation, mobility, and active engagement in society. This suggests that some older households may face limitations not only in material consumption but also in maintaining an active lifestyle, which is a key determinant of healthy ageing. Consequently, the observed consumption inequalities indicate unequal opportunities to access goods and services that support active and healthy ageing. Older households with limited financial resources are more likely to concentrate their expenditures on essential needs, whereas participation in recreational, cultural, transport, and other discretionary activities becomes increasingly constrained. Although the present cross-sectional study does not allow causal conclusions regarding health outcomes, these consumption patterns may contribute to differences in opportunities

for social participation and healthy ageing that have been reported in previous studies [17, 18].

The study has several limitations. It is based on cross-sectional data, which precludes causal inference. Moreover, the third household cluster comprised only 19 households (0.15% of the analytical sample). Consequently, its characteristics and the corresponding logistic regression estimates should be regarded as exploratory rather than representative of the broader population of older adults. The limited sample size reduces the statistical precision of the estimates and warrants cautious interpretation. Despite these limitations, the combined application of complementary income inequality measures, cluster analysis, and logistic regression enabled a multidimensional assessment of the economic heterogeneity of older households.

In conclusion, this study demonstrates that relatively moderate-income inequality among older adults coexists with pronounced consumption inequalities, particularly in expenditure categories affecting quality of life and social participation. Therefore, assessments of the economic situation of older people should consider not only the level of equivalised disposable income but also consumption patterns and the ability to meet higher order needs essential for active and healthy ageing.

From the perspective of public health policy, these findings underscore the need to design targeted interventions that reduce inequalities in access to mobility, social participation, and services supporting healthy ageing. Policies aimed at reducing income inequality among older adults should therefore extend beyond income support alone and also facilitate equitable access to opportunities for participation in social, cultural, and community life. Such an approach may contribute to promoting healthy ageing and reducing socioeconomic inequalities in later life.

CONCLUSIONS

1. Income inequalities among households aged 60 years and older are moderate, reflecting the stabilizing role of pensions and social transfers in later life.
2. Although income inequality remains relatively limited, consumption inequalities are considerably greater, particularly in discretionary expenditure categories, indicating that economic differences among older households are expressed primarily through their ability to satisfy higher order needs rather than basic needs.
3. Expenditures on basic needs show relatively low inequality, suggesting broad access to essential food and housing regardless of income level.
4. Three distinct household consumption patterns were identified among older households, confirming that

the older population is economically heterogeneous and that substantial differences exist in the ability to meet diverse consumption needs.

5. Disposable income is the primary determinant of household consumption patterns. Higher income increases the likelihood of diversified consumption, whereas lower income is associated with expenditure concentrated on essential goods. Age, educational attainment, household size, and household composition also significantly influence household cluster membership.
6. The findings support Engel's law, the life-cycle hypothesis, and human capital theory, demonstrating that greater economic resources are associated with more diversified consumption patterns and increased opportunities for participation in social and quality-of-life-related activities.
7. These findings have important implications for public health and social policy. Policies supporting healthy ageing should address not only income protection but also inequalities in access to mobility, social participation, and services that enable older adults to maintain an active and independent lifestyle.
8. Overall, the findings indicate that inequalities among older adults are multidimensional and cannot be adequately assessed using income measures alone. Evaluations of well-being in later life should therefore incorporate both financial resources and the ability to meet diverse consumption and social needs.

The present study confirms that economic inequalities among older adults extend beyond income differences to encompass disparities in consumption opportunities. This multidimensional perspective provides a broader understanding of socioeconomic inequalities in later life and may support the development of more comprehensive public health and social policies aimed at promoting healthy and active ageing.

Conflict of interest

The author declares no conflict of interest.

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