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## Determinants of Household Poverty: Identification Using Logistic Regression

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**Abstract:** *The fight against poverty is considered one of the most critical tasks in achieving sustainable development goals. This study aims to identify the key determinants of household poverty in Algeria. The information base is data from the Sixth Cluster Survey (MICS 6) conducted by the National Statistics Office during 2018-2019 with a sample of 31,325 households in each province, which are divided into three groups (poorest, poor, non-poor) using a well-being index, which is based on the data about household assets and living conditions. Polynomial logistic regression was used to model the correlation between the poverty status of households and various demographic (household size, gender, age and education level of the head of the household), socio-economic (employment of the head of the household) and spatial (place of residence (urban/rural), region) characteristics. The results showed that a higher level of education of the head of the household significantly increased the probability of households moving from the "poorest" to the "poor" or "non-poor". As the age of the household head increases, the likelihood that the household will be non-poor increases. The gender of the head of the household was not a statistically significant factor. The increase in the number of dependents as a factor of creating additional financial pressure and falling into poverty is essential only in a situation of a very drastic change in status - when moving from the status of "non-poor" to "the poorest". In contrast, a slight change in well-being (a shift from "poor" to "poorest") is not associated with an increase in the number of household members. Modeling showed that extreme poverty is more common in rural areas than in cities. Regional differences are also revealed, as the poverty level is higher in the southern regions than in the northern ones. The slight increase in household welfare (transition from the category of "poorest" to "poor") in Algeria is not due to the economic activity of the head of the household. Still, it may be related to the nature of the analyzed data (only the fact of employment was considered without specifying the nature and type of activity). Instead, a significant change in welfare (moving from the category of "non-poor" to "poorest" households) directly depends on whether the head of the household is employed or unemployed. The results of the study are essential in the context of the development of a targeted policy to reduce the poverty risks of Algerian households: increasing the level of education and skills should be a priority, especially for young people and in disadvantaged regions, targeted programs for the development of rural areas and mechanisms for the fair distribution of public investments between provinces are needed to overcome regional disproportions.*

**Keywords:** Algeria, determinants, households, logistic regression, poverty, regional disparities, welfare index.

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## Introduction

Despite the economic, social and health development and progress that the world has witnessed, extreme poverty is still widespread in many regions of the world and it constitutes the primary challenge to achieving the durable development objectives, as poverty eradication is considered the first objective of the durable development. Within this framework, most countries in the developed and developing world have to develop many plans, policies and mobilize resources in order to reduce poverty. The study of poverty is, in fact, an examination of individuals with the lowest living standards in a specific society. Since collecting data at the individual level requires a lot of resources, and many goods and services consumed by households cannot easily be attributed to individuals, the standard of living is usually measured at the family level (Coulombe and McKay, 1998, p. 417). This study relies on several procedural concepts, with poverty being one of the most important. According to the report (ESCWA, 2017, page 3), poverty can be defined from the perspective of economist Amartya Sen as the inability to enjoy fundamental rights and essential freedoms. Deprivation of capabilities represents a more comprehensive measure than income, as it covers specific aspects of the poverty phenomenon that may not be encompassed or noticed by overall economic indicators. Therefore, Sen's perspective on poverty can be translated into a multidimensional measurement of household poverty, including dimensions related to education, health, and living.

There are several challenges to measuring poverty in this concept, and the most significant is the lack of available data at the household level. The multi-indicator cluster survey is considered one of the most widely used surveys for monitoring multidimensional poverty indicators. Therefore, in this study, we will rely on the concept of the family's standard of living as a measure of household poverty. There are several methods to measure the standard of living, such as income or cash expenditure for the family, which is considered the best measure when data is available. However, due to the absence of a database containing accurate information about household income and demographic and social characteristics, we will use the wealth index as an indicator of measuring household poverty. According to ESCWA (2017), the wealth index is defined as a composite indicator that measures the well-being and wealth of the household, based on the family's ownership of a set of assets and durable goods. It is calculated based on data from the multi-indicator cluster survey for Algeria, which classifies households according to the wealth index into five categories (poorest, poor, medium, rich, richest), known as the wealth quintiles. The wealth quintiles are constructed in the multi-indicator cluster survey using data on housing, family, and personal assets, as well as water and sanitation, through principal component analysis. Thus, it is a good indicator for measuring the standard of living for the family.

Algeria, like other Third World countries, still suffers from widespread poverty, due to many social and economic factors, such as widespread unemployment and weak income levels, which constitute a major obstacle to achieving the sustainable development goals. Despite Algeria's upper middle-income status and extensive hydrocarbon resources, poverty and vulnerability persist, especially in rural areas. In order to formulate policies and develop development plans that contribute to the eradication of poverty, it is necessary to identify the most important social and economic factors that determine poverty, and then effective social and economic development programs that contribute to the eradication of multidimensional poverty, such as eliminating unemployment and illiteracy and improving living conditions in areas with the highest levels of poverty. As of 2021, Algeria has its greatest poverty rate in the past four years, with around 1.9 million individuals living below the poverty line (STATISTA, 2024). Consequently, there was a rise in the poverty rate by 200,000 individuals compared to the previous year, 2020. By comparison, both the years 2019 and 2018 documented 1.3 million instances of poverty (STATISTA, 2024). The increase in the number of individuals living below the poverty threshold can be attributed to the onset of the coronavirus (COVID-19) pandemic (STATISTA, 2024). This study aims to analyze the major factors influencing household poverty status in Algeria, with a focus on socioeconomic and demographic characteristics. The central research question is: What are the main determinants of household poverty across different regions of Algeria?

Understanding the factors that contribute to household poverty is essential for developing efficient policies and initiatives aimed at reducing poverty. The objective of this study is to analyze the primary determinants linked to the poverty status of households in Algeria by utilizing data from a national survey. Although previous research has examined factors contributing to poverty in several developing nations, there is a limited amount of research explicitly addressing the Algerian setting.

The data utilized in this analysis is derived from the Sixth Multiple Indicator Cluster Survey (MICS 6) conducted by the National Statistics Office over the period of 2018-2019. The sample encompasses more than 31000 households throughout every province. Households are categorized into three groups - poorest, poor, and non-poor - using a wealth index that is based on assets. The application of multinomial logistic regression is used to model the correlation between the poverty status of households and various demographic, socioeconomic, and spatial characteristics.

The results will illuminate the correlation between poverty rates and household attributes such as educational attainment, work status, and geographical location. This information can be utilized to devise strategies that specifically target socioeconomically disadvantaged households and regions with greater precision and effectiveness. The findings will also be juxtaposed with observations from previous research conducted in Algeria and other emerging nations. In summary, this work adds to the existing body of research on poverty analysis in Algeria. The findings have significant implications for policymakers aiming to expedite progress towards the Sustainable Development Goals, particularly Goal 1 of eradicating poverty. A comprehensive comprehension of the factors that contribute to poverty can inform strategic investments in the development of human capital, rural infrastructure, and social protection programs, with the aim of elevating households out of poverty.

## Literature Review

Poverty remains a major challenge facing many developing countries (Alkire et al., 2020), including Algeria. Identifying the key determinants of household poverty is crucial for designing effective policies and programs to alleviate poverty. A large body of literature has utilized logistic regression models to examine the factors associated with household poverty status. This review synthesizes findings from studies that have applied logistic regression to analyze determinants of household poverty based on cross-sectional household survey data. Many studies have been conducted related to poverty and the most important factors that determine it at the global level, whether at the macro or micro level, and most of them agreed that poverty levels are determined by a group of economic, social and demographic factors.

A number of studies have utilized logistic regression to examine the determinants of poverty in various countries and regions. For instance, (Geda et al., 2001) used a logit model to analyze the determinants of poverty in Kenya at the household level. Similarly, (Crentsil et al., 2019) assessed the determinants of multidimensional energy poverty in Ghana by estimating a logit regression. (Paudel et al., 2018) also employed logistic regression to understand the determinants of household cooking fuel choice in Afghanistan, which is closely linked to poverty levels.

In the African context, several studies have applied logistic regression to investigate poverty determinants (Teka et al., 2022) used logistic regression to analyze the factors influencing pastoral and agro-pastoral poverty in Ethiopia (Wulifan et al., 2017) employed multilevel logistic regression to examine the determinants of unmet need for family planning in rural Burkina Faso, which has implications for poverty levels. Additionally, (Amara and Jemmali, 2018) utilized multilevel logit models to investigate the factors contributing to poverty distribution in Tunisia.

Various studies have also focused on the determinants of poverty within specific countries or regions. For example, (Peng et al., 2019) used logistic regression to investigate the relationship between covariates and the probability of being poor in Hong Kong. (Amao et al., 2017) employed logit models to estimate the determinants of poverty in rural Nigeria. (Qurat-ul-Ann and Mirza, 2021) investigated the determinants of multidimensional energy poverty incidence and severity in Pakistan through logistic regression.

Several studies have identified household demographic and socioeconomic characteristics as significant predictors of poverty (Chen et al., 2019; Sulaimon, 2022). (Neway and Massresha, 2022) found that household education status, dependency ratio, residential area, and access to credit were significant determinants of poverty in Ethiopia.

Larger household size emerges as a robust determinant of poverty across multiple country contexts, including Kenya, Nigeria, Ethiopia, and Sri Lanka (Geda et al., 2001; Arene and Anyaeji, 2010; Bogale and Shimelis, 2009; Ranathunga and Gibson, 2014). This reflects burdens of supporting more dependents and effects of diseconomies of scale. Many studies also find that households headed by females (Mohammed and Ab-Rahim, 2021), unmarried individuals (Bersisa and Heshmat, 2021), less educated members, or unemployed members face higher odds of poverty (Reyes et al., 2004; Buba et al., 2018; Neway and Massresha, 2022). Lack of income earners and human capital constrain livelihood options (Mwaipopo, 2020). Similarly, dependence on agriculture or informal work is

associated with greater poverty risks compared to regular wage employment (Demissie and Legesse, 2013; Bersisa, 2019).

The World Bank also indicated in its latest report on poverty (worldbank, 2022) that the Corona pandemic caused 70 million people to suffer from extreme poverty in 2020 due to weak economic growth rates, which may prevent achieving the goal of eradicating poverty by 2030.

A study conducted by ( Abdulwasaa & Kawale, 2023) showed that through a review of the literature related to the determinants of poverty, it became clear that poverty is a multi-faceted and multi-dimensional global problem, and poverty levels are linked to the interaction of a group of demographic, social, economic and political factors, and there is a positive relationship between poverty and all of the following : Inequality and inflation, and a negative relationship between poverty and both: high rates of education and economic growth (Eyasu, 2020; Mohammed and Ab-Rahim, 2021), and increasing rates of population growth and household size are among the main factors that determine poverty.

Beyond demographics, studies point to linkages between poverty and asset ownership. Households with smaller landholdings, lack of livestock, limited access to credit, or fewer durable assets are more likely to be poor (Mitiku et al., 2012; Edoumiekumo et al., 2013). (Setyowati, 2020) identified income, number of dependents, number of loans from Islamic microfinance institutions, and expertise as significant factors influencing household poverty. Asset poverty limits productivity and income generation. Subjective perceptions of inadequate consumption and food insecurity are also found to predict higher likelihood of poverty (Asghar and Muhammad, 2013; Obayelu, 2012). In a study by (Sączewska-Piotrowska, 2018) on the determinants of poverty from an income perspective in Poland using logistic regression, the results showed that the education of the head of the household (SAKAKO, 2013), place of residence, labor force status, and socioeconomic class were among the most important factors determining poverty.

Some studies incorporated community-level factors using multilevel modeling. Regional disparities, lack of infrastructure, low social capital, and remoteness raise risks of multidimensional poverty (Tran et al., 2022; Amara and Jemmali, 2018). Context shapes livelihoods. Analyses also reveal that transient poverty differs from chronic poverty in terms of determinants like household shocks and volatility in income sources (Teguh and Nurkholis, 2011).

The Multidimensional Poverty Report (ESCWA, 2017, p. 23) indicates that there is variation in the distribution of poverty at the spatial level (between rural and urban, between provinces or states within countries, and between different groups of countries) and at the level of social and economic characteristics (household size, and the educational level of the head of the household (SAKAKO, 2013) and households ranked in the bottom quintile of the wealth index are 50 times more likely to be exposed to extreme poverty than households ranked in the top quintile. A study conducted in Nigeria by (Osowole et al., 2012) also showed, using a logistic regression model to identify potential determinants of household poverty using 2003/2004 National Living Standard Survey (NLSS) data, that household size, the level of living and educational level of the head of the household were among the most important determinants of poverty (Sakako, 2013), in addition to other factors such as the gender of the head of the household, the age of the head of the household in years (Chen et al., 2019), the work of the father, and the work of the mother.

While most studies apply binary logistic regression, a few utilize ordered regression for categorical measures of poverty depth (Bahta and Haile, 2013) or multinomial regression for dynamic poverty transitions (Khalid et al., 2005). Nevertheless, logistic models remain the dominant approach for modeling influences on household poverty status. The diversity of findings across countries also highlights context-specificity of determinants. Further research can build on this knowledge base using recent advances in causal inference and machine learning methods.

While the above studies provide valuable insights into the determinants of poverty across different contexts, there is a lack of research specifically focused on Algeria. To the best of our knowledge, no studies have comprehensively examined the determinants of household poverty in Algeria using logistic regression. This gap in the literature highlights the importance of conducting such an analysis to understand the unique factors influencing poverty in the Algerian context. By employing logistic regression, the proposed study can contribute to the existing body of knowledge by identifying the key household-level determinants of poverty in Algeria. This information can inform targeted policies and interventions aimed at reducing poverty and improving the well-being of Algerian households.

**Methodology**

This study utilizes data from the Sixth Multiple Indicator Cluster Survey (MICS 6) conducted in Algeria in 2018-2019 by the National Statistics Office. The sample comprised 31,325 households across all regions.

The key dependent variable is the household poverty status, measured by classifying households into three categories based on the wealth index: poorest, poor, and non-poor. The wealth index is calculated in the MICS survey using principal components analysis based on data on household assets and living conditions.

The independent variables considered include:

- Demographic factors: household size, gender, age and education level of household head
- Economic factors: employment status of household head
- Geographic factors: place of residence (urban/rural), region

Descriptive statistical analysis is first conducted to determine the distribution of households across poverty levels and regions. An ordinal logistic regression model is initially estimated with household poverty status as the ordinal dependent variable. However, the test for model fit indicated lack of fit, suggesting that the proportional odds assumption was violated. Therefore, a multinomial logistic regression is applied with 'poorest' as the reference category for the dependent variable. The parameters are estimated using maximum likelihood estimation. Odds ratios are calculated for each independent variable to determine the likelihood of households being classified as poor or non-poor compared to the poorest category. We used the open statistical program JAMOVI to analyze the data and estimate the logistic model.

*Study hypotheses:*

1. The social and demographic factors that determine household poverty in Algeria are the gender of the head of the household, the age of the head of the household, the educational level of the head of the household, and the size of the household.
2. Household poverty in Algeria is determined by economic factors (the economic activity of the head of the household)
3. There is a difference in the distribution of household poverty according to the region of residence.

The study sample is a clustered random sample, comprising the families participating in the Sixth Multiple Indicator Cluster Survey (MICS 6) in Algeria, with a total of 31325 households.

The study variables are as shown in Table 1.

Table 1. Study Variables

Independent variables	Variable symbol	variable	Variable type
Dependent variable	WBQ	Well-being quintile	Ordinal
Independent variables	HM	Number of household members	Scal
	SEX	Gender of head of household	Nominal
	elevel	Instruction from the head of household	Ordinal
	Occupation	Economic activity of the head of household	Nominal
	AGE	Age of head of household	Ordinal
	TPS	Territorial programming space (EPT)	Nominal
	PR	Place of residence	Nominal

Source: systematized by the authors based on the Sixth Multiple Indicator Cluster Survey (MICS 6).

**Results**

The following table represents the distribution of households according to their living standards based on the Quintile Wealth Index. Since the aim of this study is to identify specific factors related to household poverty, we have reclassified the Quintile Wealth Index into three levels:

**Level 1:** Represents the first quintile, i.e., the most impoverished households.

**Level 2:** Represents the second quintile, i.e., poor households.

**Level 3:** Represents non-poor households, encompassing the third, fourth, and fifth quintiles (middle-income households, rich households, and the wealthiest).

The results are summarized in table 2.

Table 2. Distribution of households according to the living standard

Frequencies of WBQ			
WBQ	Counts	% of Total	Cumulative %
The poorest	6481	20.7 %	20.7 %
Poor	6091	19.4 %	40.1 %
Not poor	18753	59.9 %	100.0 %

Source: Authors' own work.

Through Table 2, we observe that 20.7% of households in Algeria are classified as "poorest", 19.4% are classified as "poor," and 59.9% of households are classified as "non-poor," which includes those categorized as either "average," "rich," or "very rich" in terms of living standards.

Since the dependent variable is an ordinal variable, we will estimate an ordinal regression model using the statistical software JAMOVI. The results are summarized in table 3.

Table 3. Results of the model fit test of the ordinal regression model

							Overall Model Test		
Model	Deviance	AIC (Akaike Information Criterion)	BIC (Bayesian Information Criterion)	R <sup>2</sup> <sub>McF</sub> (McFadden's R-squared)	R <sup>2</sup> <sub>CS</sub> (Cox and Snell's R-squared)	R <sup>2</sup> <sub>N</sub> (Nagelkerke's R-squared)	χ <sup>2</sup> (chi- 2)	Df (Degrees of freedom)	Prob
1	47042	47064	47155	0.191	0.116	0.244	11086	9	<.001

Note. The dependent variable 'WBQ' has the following order: The poorest | Poor | Not poor

Source: Authors' own work.

Since the chi-square statistic is statistically significant, it indicates the model's lack of fit. This means that the observed data does not align well with the appropriate model. Therefore, the ordinal regression model is not valid. We assume that the dependent variable is not ordinal, and we proceed to estimate a multiple logistic regression model. The results are summarized in table 4.

Table 4. Results of the model fit test of the multiple logistic regression model

						Overall Model Test		
Model	Deviance	AIC (Bayesian Information Criterion)	R <sup>2</sup> <sub>McF</sub> (McFadden's R-squared)	R <sup>2</sup> <sub>CS</sub> (Cox and Snell's R-squared)	R <sup>2</sup> <sub>N</sub> (Nagelkerke's R-squared)	χ <sup>2</sup> (chi- 2)	Df (Degrees of freedom)	Prob
1	46634	46698	0.198	0.120	0.252	11494	30	<.001

Source: Authors' own work.

The results in Tables 3 and 4 show that the Pseudo R-Square value for McFadden (0.198) in the multiple logistic regression model is higher than the Pseudo R-Square value for McFadden (0.191) in the logistic regression model. This indicates that the multiple logistic regression model is more suitable for the data.

The results of the estimation of multinomial logit shown in table 5.

Table 5. Results of multinomial logistic regression model (The reference category is: The poorest)

WBQ (Well-being quintile)	Predictor	Estimate	Standard Error	Z Statistic	Probability	
Poor- The Poorest	Intercept	-0.27970	0.09070	-3.0836	0.002	
	HM (Number of household members)	0.00260	0.00928	0.2804	0.779	
	SEX	Feminine- masculine	0.04714	0.06718	0.7017	0.483
	AGE	35-44 years – Under 35 years	-0.01645	0.06791	-0.2422	0.809
		45 – 59 years – Under 35 years	0.33116	0.06954	4.7624	<.001
		60 years and above – Under 35 years	0.76348	0.07968	9.5816	<.001
	Elevel	Primary – Preschool or None	0.57632	0.05408	10.6576	<.001
		Medium – Preschool or None	0.92815	0.05903	15.7236	<.001
Secondary – Preschool or None		1.22611	0.07538	16.2648	<.001	

Table 5 (cont.). Results of multinomial logistic regression model (The reference category is: The poorest)

WBQ (Well-being quintile)	Predictor	Estimate	Standard Error	Z Statistic	Probability	
		Higher – Preschool or None	1.84223	0.16575	11.1147	<0.001
	Occupation (Economic activity of the head of household)	Not occupied – Occupied	0.00146	0.04552	0.0322	0.974
	PR (Place of residence)	Rural – Urban	-1.24530	0.03895	-31.970	<0.001
	TPS (Territorial programming space)	HP (High Plateaus) – NORD	0.08299	0.04154	1.9980	0.046
		SUD – NORD	0.28376	0.05839	4.8598	<0.001
Not poor - The poorest	Intercept	-0.63734	0.08951	-7.1207	<0.001	
	HM (Number of household members)	0.04283	0.00878	4.8772	<0.001	
	SEX:	Feminine - masculine	0.16640	0.06280	2.6498	0.008
	AGE	35-44 years – Under 35 years	0.19878	0.06909	2.8773	0.004
		45 – 59 years – Under 35 years	1.17567	0.07001	16.7928	<0.001
		60 years and above – Under 35 years	2.28596	0.08069	28.3317	<0.001
	Elevel	Primary – Preschool or None	1.25138	0.05270	23.7451	<0.001
		Medium – Preschool or None	1.99252	0.05816	34.2579	<0.001
		Secondary – Preschool or None	2.84937	0.07155	39.8226	<0.001
		Higher – Preschool or None	4.34296	0.15296	28.3927	<0.001
	Occupation (Economic activity of the head of household)	Not occupied – Occupied	-0.18724	0.04420	-4.2358	<0.001
	PR (Place of residence)	Rural – Urbain	-2.54911	0.03805	-66.987	<0.001
	TPS (Territorial programming space)	HP – NORD	-0.03875	0.03934	-0.9850	0.325
SUD – NORD		-0.03273	0.05658	-0.5786	0.563	

Source: Authors' own work.

In the estimated models, the most impoverished households were the reference category, and two models were estimated:

- The "Poor Household" category versus the "Most Impoverished Household" category.
- The "Non-Poor Household" category versus the "Most Impoverished Household" category.

For the comparison of "Poor Households" versus "Very Impoverished Households," the results indicate:

- The regression coefficient for the household size variable is not statistically significant (probability greater than 0.05), meaning that the household size does not lead to a significant change in the living standard from the most impoverished to poor households.
- The gender of the head of the household does not have a statistically significant effect on the household's living standard (probability greater than 0.05).
- Regarding the age of the head of the household, it is observed that the regression coefficient for the age group (35-44 years – Under 35 years) is not statistically significant. However, the regression coefficients for both (45 – 59 years – Under 35 years) and (60 years and above – Under 35 years) are positive and statistically significant. This means that the probability of belonging to a poor household, compared to a more impoverished household, increases by 0.33 units if the age of the head of the household rises from under 35 years to the age range of (45-59 years). This probability further increases to 0.76 units if the age of the head of the household rises above 60 years.
- Regarding the residential area, the regression coefficient is negative and statistically significant. This means that if the place of residence moves from an urban area to a rural area, the probability of the household belonging to the "Poor" level, compared to the "poorest" level, decreases by 1.25 units.



- Regarding the educational level of the head of the household, it is observed that all regression coefficients are positive and statistically significant. If the educational level increases from "No educational level" to "Primary level", the probability that the household belongs to a poor household increases by 0.58 units. This probability continues to rise, reaching 1.84 units if the educational level increases to a higher level. In other words, as the educational level of the head of the household increases, the likelihood of the household transitioning from the "Most Impoverished" level to the "Poor" level increases.
- For the economic activity of the head of the household, it is observed that the regression coefficient is not statistically significant.
- The regression coefficients for the geographic region variable are positive and statistically significant. When the residence of the household moves from the North to the High Plateaus region, the probability of the household transitioning from the "poorest" level to the "Poor" level increases by 0.08 units. This probability further rises to 0.28 units when the residence of the household moves from the North to the South. In other words, as we move towards the southern regions, the likelihood of households being "poor", compared to being "poorest", increases.

For non-poor vs poorest households the results indicate:

- The regression coefficient for the household size variable is positive and statistically significant. This means that as the number of individuals in the household increases, the probability of the household being "poor" compared to the "poorest" increases by 4.28%.
- The regression coefficient for the gender of the head of the household is not statistically significant. This implies that gender is not a determinant factor for the poverty level of households in Algeria.
- The regression coefficient for the economic activity of the head of the household is negative and statistically significant. This means that when the economic activity changes from active to inactive, the probability of the household being non-poor compared to the most impoverished decreases by 0.19 units.
- All regression coefficients for the age of the head of the household are positive and statistically significant, and they are larger compared to the coefficients for (Poor Household vs. poorest Household). When the age rises from under 35 years to the age range (35-44 years), the probability of the household belonging to the "Non-Poor" living standard, compared to the "poorest," increases by 0.24 units. This probability further increases to 1.49 units when the age moves to (45-59 years), and rises to 2.36 units if the age exceeds 60 years. In other words, as the age of the head of the household increases, the living standard of the household improves, transitioning from the "poorest" level to a "Non-Poor" level.
- The regression coefficients for the educational level of the head of the household are all positive and statistically significant. They are larger than the coefficients for the case of (Poor Household vs. poorest Household). As the educational level increases from "No educational level" to "Primary level," the probability of the household belonging to a "Non-Poor Household" increases by 1.25 units. This probability continues to rise, reaching 4.34 units for the "Higher Education" level. In other words, as the educational level of the head of the household increases, the living standard of the household improves, and the likelihood of the household being non-poor increases.
- The regression coefficient for the residential area is negative and statistically significant, with a larger absolute value compared to the coefficient for the "Poor Household vs. Very Poor Household" case. When the place of residence moves from an "Urban" area to a "Rural" area, the probability of the household being non-poor compared to the most impoverished decreases by 2.47 units.
- The regression coefficient for the geographic region variable is not statistically significant.

**The first hypothesis:** The social and demographic factors determining the poverty of households in Algeria include the age of the head of the household, the gender of the head of the household, the educational level of the head of the household, and the household size.

- The results of various previous studies indicate variations in the distribution of poverty based on socio-demographic characteristics of households, aligning with the findings from the multiple logistic regression results. All regression coefficients for socio-demographic characteristics were statistically significant, except for the variable of the gender of the head of the household, where the regression coefficient was not statistically significant. These results confirmed that the household size does not have a significant impact in the case of (Poor Household vs. Very poorest). However, it was positive and statistically significant in the case of (Non-

Poor Household vs. Poorest Household), meaning that as the household size increases by one individual, the probability of the household being non-poor compared to the most impoverished increases by 4%. These results contradict previous studies, as various studies in the field suggest that an increase in the number of household members leads to an increase in dependents, creating additional financial pressures on the household budget and increasing the likelihood of the household falling into poverty.

- The results also indicate that as the age of the head of the household increases, the probability of the household being non-poor also increases. The regression coefficient for the age group (60 years and above) increased from 0.76 in the case of "Poor Household vs. poorest Household" to 2.28 in the case of "Non-Poor Household vs. Very Poor Household." Therefore, as the age of the head of the household rises, the household poverty rate tends to decrease.
- The results also demonstrated that the regression coefficients for the educational level of the head of the household are all positive and statistically significant. Furthermore, the regression coefficients in the case of "Non-Poor Household vs. Very poorest" increased compared to the coefficients in the case of "Poor Household vs. Very Poor Household". For instance, the regression coefficient for the "High Education Level" increased from 1.84 in the case of "Poor Household vs. Very Poor Household" to 4.34 in the case of "Non-Poor Household vs. Very Poor Household." This implies that as the educational level rises from "No formal education" to "High Education Level," the probability of the household being "Poor" compared to the "Most Impoverished" increases by 1.84 units. This probability further increases to 4.34 units for the household being "Non-Poor" compared to the "Most Impoverished." In other words, as the educational level of the head of the household increases, the likelihood of poverty decreases. This is attributed to lower education levels leading to higher unemployment and lower wages, while higher educational levels provide better employment opportunities and advancement in job positions as individuals age. This also explains the inverse relationship between age and poverty rates, where an increase in the age of the head of the household is associated with a decrease in the likelihood of poverty.

**The second hypothesis:** Household poverty in Algeria is determined by economic factors, specifically the economic activity of the head of the household.

- The regression coefficient for the economic activity variable of the head of the household is not statistically significant in the case of "Poor Household vs. the poorest Household". This may primarily be attributed to the nature of the data, which was not detailed enough. The economic activity variable for the head of the household only included an indicator of whether they are employed or not, without specifying the nature of the activity or distinguishing between inactive categories (unemployed, retired, etc.) and the type of economic activity they engage in, which is a key determinant of income levels.
- However, this coefficient was negative and statistically significant in the case of "Non-Poor Household vs. the poorest Household". This means that when the head of the household transitions from being employed to unemployed, the likelihood of the household being non-poor compared to the most impoverished decreases. This aligns with previous study results, as the lack of economic activity by the head of the household leads to lower income levels, reducing the likelihood of the household being non-poor and increasing the likelihood of falling into poverty.

**The third hypothesis:** There is a difference in the distribution of household poverty according to the region of residence

- The results of this study align with previous studies that have demonstrated that extreme poverty is more prevalent in rural areas compared to urban areas. The regression coefficients for the variable representing the "Rural" region compared to the "Urban" region were negative and statistically significant. Additionally, the regression coefficients in the case of "Non-Poor Household vs. Poorest Household" were larger in absolute value than those in the case of "Poor Household vs. poorest." This means that when the area of residence moves from an "Urban" area to a "Rural" area, the likelihood of the household being "Poor" compared to the "Poorest" decreases by 1.24 units. This probability decreases further to 2.55 units in the case of "Non-Poor Household vs. Poorest Household." These results confirm that extreme poverty is more prevalent in rural areas compared to urban areas.

## Conclusion

This study aimed to identify the most important determinants of household poverty in Algeria using national survey data and multinomial regression models. We relied on the raw database of the sixth multi-indicator cluster

survey for Algeria MICS6-2019. The dependent variable was the extent of household poverty, which we measured using the wealth index quintiles where we reclassified the living standards of households according to the wealth index quintiles into three categories (poorest, poor, non-poor).

The results showed that the age of the head of the household, his educational level, economic activity, household size and area of residence were among the most important determinants of household poverty. The older the head of the household, the more likely that the household would be non-poor. The higher the educational level, the more likely the household would be non-poor. Also, if the head of the household did not have an economic activity, it increased the likelihood of the household being exposed to poverty, with these probabilities being higher for "non-poor household" compared to "poorest" than for "poor household" compared to "poorest".

The results also showed that as household size increased, the likelihood of the household being "non-poor" compared to "poorest" also increased, while the likelihood of the household being "poor" compared to "poorest" decreased in "rural" areas compared to "urban" areas, and decreased even more for "non-poor household" compared to "very poor", meaning that the poorest households are more prevalent in rural than urban areas.

These results have crucial policy implications. Boosting educational attainment and skills training should be a priority, especially for youth and in disadvantaged regions. Targeted rural development programs are needed to uplift rural households through improved infrastructure, connectivity, diversification of income sources beyond agriculture, and basic service delivery. Regional imbalances must be tackled through equitable public spending and investments across provinces.

Furthermore, the study proposes the following actions:

- Offer tailored financial assistance, enhance access to education and vocational training, and foster gender equity in employment to alleviate poverty in households led by women.
- Boost awareness and availability of family planning options through community-driven educational and outreach initiatives to lessen multidimensional poverty in families not practicing family planning.
- Deliver specialized support to younger households more vulnerable to multidimensional poverty, considering their distinct needs and obstacles.
- Motivate the youth, especially girls, to seek higher education, as attaining higher education levels is linked with a lower risk of falling into multidimensional poverty.

Implementing these strategies could aid in developing and executing effective poverty reduction policies that recognize and address the complex facets of poverty in Algeria.

While the wealth index provides useful proxy measurements for poverty, further research should incorporate detailed income and expenditure data to enrich the analysis. Panel data could also provide insights into poverty dynamics over time. Additionally, multidimensional poverty indices can be constructed to capture non-income aspects. Overall, a nuanced understanding of poverty determinants can inform data-driven, context-specific policies to accelerate Algeria's progress towards the Sustainable Development Goals. Sustained political commitment along with integrated policy interventions will be key to equitable and inclusive growth.

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