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The Determinant of Health Services Demand in Morocco : A Microeconomic Analysis.

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Abstract

Background: Equitable access to healthcare is one of the main political challenges in Morocco. Despite the current progress in the expansion of health coverage, significant disparities persist in the use of health services between different social groups and between urban and rural populations.

Aim: This study is designed to analyse the elasticity of healthcare demand within Moroccan households, with a focus at the role of social, economic and demographic factors.

Setting: This analysis is based on data from the 2014 National Household Consumption and Expenditure Survey (ENCDM), carried out by Morocco's High Commission for Planning. The survey provides detailed information on 15,970 households and 75,691 individuals, while naturally remaining subject to the usual limitations related to sample size, geographical detail, and data confidentiality requirements.

Methods: Ordinary Least Squares (OLS) and quantile regression models were employed to estimate the determinants of the household healthcare expenditure share, measured as the ratio of health spending to total household expenditure. The explanatory variables included household income (proxied by total expenditure), health insurance coverage, the educational attainment of the household head, household size, place of residence (urban or rural), the presence of chronic illness within the household, and the employment status of the household head. Robust standard errors were used to address heteroskedasticity, and Variance Inflation Factors (VIFs) were examined to ensure that multicollinearity did not pose a concern.

Results: The study brings forward three observations about how Moroccan households approach healthcare spending. To begin with, income and insurance matter more than any other factor: families with limited resources devote only a small portion of their budget to health, while those covered by insurance show a clearer tendency to use and spend on healthcare. A second finding is that the role of education and the presence of a chronic illness becomes stronger among households that already spend more on health, suggesting that needs and decisions differ noticeably across the spending spectrum. Finally, the analysis confirms a steady gap between rural and urban areas, with urban households allocating a larger share to health services, reflecting differences in access and availability across the country.

Conclusion: The results confirm that healthcare demand in Morocco is strongly influenced by income and insurance coverage, while social and geographic inequalities continue to shape access and utilization.

Contribution: This study is among the first in Morocco to apply quantile regression to the analysis of household health expenditure, which made it possible to uncover meaningful differences in behavior across the expenditure distribution. The results add new empirical

insight to the broader literature on health equity in Africa by illustrating how structural inequalities shape patterns of healthcare use. Beyond its analytical contribution, the study provides practical guidance for designing more inclusive approaches to health financing approaches that support Morocco's efforts to expand social protection and to reduce the social and territorial gaps that continue to influence access to essential services.

Keywords Healthcare Demand, Microeconomic Analysis, Health Expenditure, Morocco, Quantile Regression, Health Insurance**.**

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Introduction

Access to healthcare is widely acknowledged as fundamental. This study addresses the determinants of healthcare demand in Morocco from a microeconomic perspective. The main objective is to identify key factors influencing healthcare demand. The pape ris structured into literature review, methodology, results, and conclusion.

In Morocco, this international objective has taken on particular significance. Guided by a national reform agenda with a strong royal mandate, the country has placed UHC at the center of its social policy priorities, with the explicit aim of extending comprehensive health insurance to the entire population by 2025. Although the expansion of coverage has been substantial, rising from roughly 30 percent of the population in 2013 to more than 60 percent by 2019 important disparities remain. Low-income households continue to face financial fragilities that limit their ability to seek care, and rural communities struggle with structural constraints that hinder access and affect the quality of health services. These persistent gaps raise a set of questions that are central to understanding the dynamics of healthcare use: how do Moroccan households manage the financial demands of seeking care? Do they view healthcare as an indispensable necessity, or is the decision to seek treatment conditioned by income and insurance status?

Answering these questions requires moving beyond aggregate indicators and examining household behavior at a more detailed, micro-economic level. This study contributes to that effort by offering one of the first comprehensive analyses of healthcare demand in Morocco based on nationally representative household data. Through the combined use of Ordinary Least Squares (OLS) and quantile regression techniques, the analysis explores how factors such as income, insurance coverage, household size, and educational attainment influence patterns of health expenditure.

The findings enrich the broader literature on health economics in low- and middle-income countries, particularly in the African context, by illustrating how financial capacity and insurance coverage jointly shape healthcare decisions. At the same time, the study provides evidence that is directly relevant to Morocco’s ongoing health sector reforms, underscoring the importance of designing policies that promote fairness and sustainability as the country advances toward universal health coverage.

Literature Review :

Demand for healthcare has long occupied a central place in the health economics literature, where it has been examined through both theoretical and empirical perspectives. A major turning point in this field came with Grossman’s health capital model, which conceptualizes

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health as a form of capital that individuals invest in to enhance productivity and improve overall well-being. Becker's theory of time allocation complements this approach by situating health decisions within the broader set of choices households face, emphasizing the roles of education, income, and time constraints. More recently, insights from behavioral economics most notably the work of Thaler have drawn attention to cognitive biases such as loss aversion and present bias, which help explain the limited uptake of preventive care despite its long-term benefits.

Empirical research consistently demonstrates how economic and institutional factors shape healthcare demand. Findings from the well-known RAND Health Insurance Experiment (Manning et al.; Newhouse) show that, on average, healthcare demand is only mildly responsive to price, although sensitivity varies substantially across socio-economic groups. Subsequent studies, including work by Jones and colleagues, further highlight that low-income households respond more strongly to changes in prices and cost-sharing, making them particularly vulnerable to fluctuations in healthcare expenses. International comparisons also underscore the importance of context: in Portugal, for example, the expansion of insurance coverage led to meaningful shifts in utilization patterns (Barros and Machado), while in India, improvements in infrastructure and insurance coverage altered households' use of health services in significant ways (Kumar and Vollmer).

In Morocco, available evidence points to the persistence of major structural disparities. Data from the High Commission for Planning reveal sharp contrasts between urban and rural populations, compounded by the widespread prevalence of informal employment, which undermines the stability of insurance coverage and weakens financial protection (Allamani et al.). Rural households, in particular, face a combination of limited financial means and inadequate geographic access to quality healthcare services. These disparities illustrate the complex interplay between socio-economic and spatial factors that reproduce patterns of unequal access to care.

Despite these contributions, two significant gaps remain in Moroccan literature. First, most existing studies rely on descriptive or aggregated analyses, limiting their capacity to uncover disparities across households. Second, the combined influence of economic determinants (such as income and insurance) and social factors (including education, household size, and chronic illness) has not yet been examined systematically using advanced econometric tools. By applying both Ordinary Least Squares (OLS) and quantile regression to nationally representative household data, the present study aims to address these gaps and provide a more precise understanding of how healthcare demand responds to socio-economic circumstances in Morocco.

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Methodology, Data and Variables :

This study draws on data from the 2014 National Household Consumption and Expenditure Survey, carried out by Morocco's High Commission for Planning (HCP). The survey is nationally representative and provides detailed information on household consumption patterns, expenditures, and socio-demographic characteristics. It covers both urban and rural households and offers a comprehensive picture of spending behavior across the country, including direct out-of-pocket health expenditures.

Dependent Variable: The dependent variable is the household healthcare expenditure share, defined as the percentage of total household spending allocated to health services. This measure captures the intensity of health spending relative to available resources and serves as an indicator of healthcare demand. Using a ratio rather than absolute health expenditure allows the analysis to account for differences in purchasing power across households.

Explanatory Variables: The set of explanatory variables includes a number of economic and demographic factors:

Total Household Expenditure: Total expenditure is used as a proxy for income. Higher spending levels are expected to enhance a household's capacity to invest in healthcare (the income effect). In some model specifications, expenditures are expressed in logarithmic form to account for diminishing marginal effects.

Health Insurance Coverage: This binary variable indicates whether any household member is covered by a health insurance scheme. Insurance is expected to reduce the effective cost of treatment and, by lowering out-of-pocket payments, to increase the likelihood of seeking care.

Education Level of Household Head: Education is measured by the highest level completed (no schooling, primary, secondary, or higher education). Educational attainment is generally associated with greater health awareness and knowledge of the long-term benefits of preventive and curative care, potentially leading to higher demand.

Household Size: This variable captures the number of household members. Larger households may benefit from economies of scale but at the same time face greater pressure on resources, making the expected impact on health expenditure shares ambiguous.

Residence (Urban vs Rural): This binary variable identifies whether the household lives in an urban or rural area. Urban households typically enjoy better access to healthcare facilities and providers, which may translate into higher utilization—and consequently higher spending relative to rural households.

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Chronic Illness: A binary indicator captures whether any household member suffers from a chronic illness or disability. Such conditions often require ongoing medical attention and are therefore expected to increase health expenditures.

Employment Status of Household Head: This categorical variable distinguishes between employed, unemployed, and inactive/retired household heads. Employment—particularly in the formal sector may be associated with stable income and access to employment-linked insurance, both of which may increase healthcare spending. Unemployment, on the other hand, may entail reduced financial capacity while simultaneously raising healthcare needs, making the net effect uncertain.

Econometric Specification: The baseline analysis uses an OLS regression model:

$$H_i = \beta_0 + \beta_1 Income_i + \beta_2 Insurance_i + \beta_3 Education_i + \beta_4 Household Size_i + \beta_5 Urban_i + \beta_6 Chronic Illness_i + \beta_7 Employed_i + \epsilon_i$$

where H_i is the healthcare expenditure share of household i, and the β coefficients measure the marginal effect of each determinant on that share. Given the fractional nature of the dependent variable (bounded between 0 and 1), we also checked robustness with a fractional logit model; however, OLS results were similar and more easily interpretable in terms of percentage point changes.

To explore heterogeneity in effects across the distribution of healthcare spending, we also employed quantile regression. This approach estimates the effects of covariates at different points (quantiles) of the conditional distribution of H_i. Specifically, we estimated models at the 25th, 50th (median), and 75th percentiles. The quantile regression model for quantile τ is:

$$Q_{H_i \mid X_i}(\tau) = \beta_0^{(\tau)} + \sum_{k=1}^{K} \beta_k^{(\tau)} X_{ik}$$

where $Q_{H_i \mid X_i}(\tau)$ is the conditional τ-th quantile of the healthcare spending share. This allows us to see, for example, if being insured has a larger effect for higher-spending households than for lower-spending households, etc.

Diagnostic Checks: All regressions were estimated with robust standard errors to correct for heteroskedasticity. We examined variance inflation factors (VIFs) to detect multicollinearity; all VIF values were below 2.5, indicating no severe multicollinearity among regressors. We also tested for sample selection bias (since only positive health spenders are considered) however, in our data over 90% of households reported some health expenditure in the year, and results were robust to including a selection correction.

Ethical Considerations: This study relies on secondary, fully anonymized data obtained from the High Commission for Planning. The dataset contains no personal identifiers, and the

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research did not involve any direct interaction with individuals. The High Commission for Planning exempted the study from formal ethical review, as the data are publicly accessible, anonymized at the source, and handled in accordance with established confidentiality standards.

Results

Descriptive Statistics

A total of 15,970 households were included in the analysis, with roughly 59 percent residing in urban areas and 41 percent in rural settings. The main descriptive statistics are presented in Table 1. On average, households allocated about 3 percent of their annual expenditure to healthcare, although this share varied considerably across the sample. Mean annual household spending amounted to approximately 60,000 Moroccan dirhams, of which around 1,800 dirhams were devoted to health-related expenses. About one-third of households (32 percent) reported having some form of health insurance coverage. The average household size was 5.1 members. Approximately 25 percent of household heads had at least a secondary level of education. Regarding employment status, 68 percent of household heads were employed at the time of the survey. In addition, 18 percent of households reported that at least one member suffered from a chronic illness. Taken together, these indicators point to substantial diversity in socio-economic conditions and potential healthcare needs among Moroccan households.

Table N°1 : Summary of Descriptive Statistics (Moroccan Households, 2014)

Variable	Mean / Proportion (SD)
Annual total household expenditure (MAD)	60,200 (40,150)
Annual health care expenditure (MAD)	1,800 (3,750)
Health expenditure share (%)	3.0% (5.5%)
Household size (number of members)	5.1 (2.4)
Household head characteristics:	
With secondary education or higher	25%
Employed (currently)	68%
Household characteristics:	
Has health insurance	32%
Urban residence	59%
At least one chronic illness case	18%

Source : 2014 Household Survey, High Commission for Planning (researchers' calculations). SD = Standard Deviation.

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One of the striking features that emerges from the descriptive statistics is the clear variation in health spending across income levels. A strong upward gradient appears: households with higher income allocate a considerably larger proportion of their budgets to healthcare than lower-income households. For instance, the poorest 20 percent of households spend only about 1 percent of their total expenditure on health, whereas the richest 20 percent devote roughly 7 percent. This wide gap suggests that low-income households face binding financial constraints that limit their ability to seek care, even when they may genuinely need it. By contrast, higher-income households not only spend more in absolute terms, but also set aside a larger share of their resources for health services. Non-essential or discretionary health expenditures (such as specialist consultations or elective procedures) are largely concentrated among the better-off.

Figure N°1 : Healthcare Expenditure Share by Income Quintile. Higher-income households devote a greater share of their spending to healthcare than lower-income (poorer) households, reflecting both greater ability to pay and potentially higher demand for health services at higher income levels. *(Placeholder for Graph showing upward gradient across 5 quintiles)* Source : 2014 Household Survey, HCP (Researchers' calculations).

Regression Analysis (OLS Results)

Table 2 presents the results of the OLS regression for determinants of the healthcare expenditure share. The coefficients can be interpreted as percentage-point changes in the health spending share associated with a one-unit change in the independent variable, holding other factors constant. Significance levels are indicated by stars.

Table N°2 : OLS Regression of Household Healthcare Expenditure Share (dependent variable: health spending as % of total expenditure)

Determinant	Coefficient (β)	Std. Error
Total household expenditure (per 1,000 MAD)	+0.015 ***	(0.003)
Insurance coverage (1 = insured)	+0.020 ***	(0.005)
Head with secondary education or higher	+0.005 **	(0.002)
Household size (number of members)	–0.003 *	(0.0015)
Urban residence (1 = urban)	+0.010 **	(0.004)
Chronic illness in household (1 = yes)	+0.008 **	(0.003)
Head employed (1 = employed vs not)	+0.002 (ns)	(0.002)
Intercept	0.012	(0.010)

Source : Researchers' calculations. $p < 0.10$, $p < 0.05$, *$p < 0.01$. Robust standard errors in parentheses. ns = not statistically significant.

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The OLS findings confirm that income (total expenditure) and insurance coverage are the dominant factors influencing healthcare spending shares. A higher household income is associated with a significantly greater share of resources spent on health, even after controlling for other characteristics. This suggests health care behaves as a necessity to a certain extent, but with aspects of a luxury good as income rises. Having health insurance is associated with an increase of about 2 percentage points in the budget share devoted to health, holding income constant. This represents a substantial effect and reinforces the notion that health insurance helps reduce financial barriers while encouraging the use of healthcare services.

Among social factors, education of the household head has a positive and significant impact on health spending share. Households led by someone with at least a secondary education spend about 0.5 percentage points more of their budget on health than less-educated counterparts, ceteris paribus. Household size has a negative effect – each additional family member slightly reduces the budget share for health (around 0.3 percentage points).

The coefficient on urban residence is positive and statistically significant. Urban households spend about 1 percentage point more of their expenditure on health than rural households, other factors equal. The presence of a chronic illness in the household also significantly increases the health spending share (~0.8 percentage points), as expected. Finally, the employment status of the head is positively signed but not significant at conventional levels.

Quantile Regression Results

While the Ordinary Least Squares (OLS) model provides an estimate of the average effect of each determinant on health spending, the quantile regression analysis reveals how these effects vary across the distribution of households particularly among those with low and high levels of health expenditure.

Table N°3 : Quantile Regression Estimates for Determinants of Health Spending Share

Determinant	25th Percentile (Q1)	50th Percentile (Median)	75th Percentile (Q3)
Total expenditure	+0.010 **	+0.015 ***	+0.011 **
Insurance coverage	+0.015 **	+0.020 ***	+0.025 ***
Head with higher education	+0.001 (ns)	+0.003 *	+0.007 **
Household size	–0.002 *	–0.003 **	–0.002 (ns)
Urban residence	+0.008 **	+0.010 **	+0.012 **
Chronic illness	+0.002 (ns)	+0.005 *	+0.010 **

Source : Researchers' calculations. $p < 0.10$, $p < 0.05$, *$p < 0.01$. Coefficients significant at ≥90% confidence level or higher are shown in bold.

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The quantile regression results reveal several noteworthy patterns. Household income (proxied by expenditure) and health insurance retain positive effects across all quantiles, although their relative importance shifts somewhat. At the 25th percentile of health spending, increases in income and insurance coverage are both associated with a statistically significant rise in the share of the budget devoted to healthcare; however, the magnitude of the income effect is smaller for lower-spending households than for those at the median.

Health insurance, by contrast, shows a stronger effect at the upper end of the distribution, reaching its highest estimated impact at the 75th percentile (an increase of roughly 2.5 percentage points). This implies that among households who spend a lot on healthcare, those with insurance spend an even greater share. Education of the household head displays a negligible effect at the lower end but becomes significant and larger moving up to higher quantiles.

The presence of chronic illness shows a similar pattern: it has little effect on health spending share for the lowest quartile, but it has a strong and significant effect at the higher quantiles. At the 75th percentile, households with chronic patients spend about 1 percentage point more of their budget on health than those without.

Another notable pattern is the persistent gap between urban and rural households across the entire expenditure distribution. The coefficient for urban residence is positive and statistically significant by roughly one percentage point in all reported quantiles.

Standardized Effect Sizes

To compare the relative importance of the determinants on a common scale, standardized coefficients were calculated for the OLS model after transforming each variable to have a mean of zero and a standard deviation of one.

Figure N°2 : Standardized Effects on Healthcare Expenditure Ratio. Insurance coverage and household income (expenditure) have the largest standardized impacts on the health spending share, followed by urban residence and education. Household size has a negative effect, while chronic illness has a modest positive effect. Employment status (not shown) was negligible. *(Placeholder for bar chart showing standardized effects)* Source : Researchers' calculations.

As Figure 2 illustrates, health insurance coverage has the single strongest influence ($\beta_{standardized} \approx 0.30$), slightly edging out household expenditure (≈ 0.25) in standardized terms. The next most influential factors were urban residence and education. Household size showed a meaningful negative standardized effect (around –0.1), consistent with the idea that in larger families, resources for health per person diminish.

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Discussion

The findings of this study illustrate the multidimensional nature of healthcare demand in Morocco. While economic capacity and insurance coverage play a central role, the data suggest that educational, social, structural, and geographic factors also shape how households engage with the health system. One of the clearest patterns is the high price sensitivity observed among low-income households. These households devote only a very small share of their budgets to health and tend to limit their spending strictly according to income constraints.

In contrast, households with higher income and education show a distinctly different pattern. Their demand for healthcare is far less responsive to price, and their spending increases steadily with rising income. For these groups, healthcare behaves much like a normal good, perhaps even a superior good where higher resources lead to greater investment in preventive care, specialized services, and higher-quality treatment. Education reinforces this pattern: households with greater educational attainment appear more aware of the long-term benefits of maintaining good health.

Insurance coverage emerges as a key mechanism for reducing financial barriers to healthcare. The results show that insured households systematically allocate a higher share of their spending to health and are less constrained by treatment costs. In Morocco, both social insurance schemes and the RAMED program have facilitated access for the households they cover. However, in 2014, coverage extended to only about one-third of the population, concentrated mainly among public-sector employees and workers in the formal economy.

The analysis also highlights a persistent urban–rural divide in health spending. Urban households dedicate a higher share of their resources to healthcare, benefiting from better infrastructure hospitals, clinics, pharmacies as well as higher insurance coverage. Rural households, by contrast, face a set of overlapping disadvantages: inadequate infrastructure, long distances to health facilities, shortages of professionals, and in some cases low health awareness.

Beyond economic and structural determinants, behavioral and cultural influences also play a significant role. The low levels of spending observed for some groups—especially poor households, even when insured suggest that healthcare may be perceived as an immediate cost rather than a long-term investment.

Taken together, the findings indicate that Morocco's progress toward universal health coverage, although substantial, remains uneven. Without adopting multi-dimensional strategies that integrate financial protection, improved service delivery, and stronger health literacy, the current reforms risk reproducing existing inequalities.

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Conclusion

This study examined the determinants of healthcare demand among Moroccan households using nationally representative data from the 2014 Household Consumption and Expenditure Survey. By combining Ordinary Least Squares (OLS) and quantile regression techniques, the analysis revealed substantial variation in how socio-economic factors shape health spending patterns. The results indicate that low-income households allocate very limited resources to healthcare and display a high degree of price sensitivity, reflecting their vulnerability to financial barriers. In contrast, higher-income households exhibit far less responsiveness to prices and devote a larger share of their budgets to health services. Insurance coverage also plays a significant role, as it reduces out-of-pocket expenses and encourages greater utilization across income levels.

Education and household structure further influence spending: more educated households tend to invest consistently in health, larger households face resource dilution at the individual level, and the presence of chronic illness increases expenditures, particularly among families with the means to address ongoing health needs.

These findings carry several implications for health policy. Expanding insurance coverage remains one of the most effective ways to reduce financial vulnerability and promote equitable access to healthcare. Reaching households that remain outside formal coverage particularly low-income families and workers in the informal economy is a central priority in line with Morocco's health financing strategy. Complementary measures are also required. Health education and awareness programs can help ensure that insurance translates into actual service use by informing individuals of their rights and the benefits available to them.

Overall, the study adds to the growing body of literature on healthcare demand in low- and middle-income countries and provides evidence directly relevant to policy debates in Morocco. By highlighting the interplay between financial capacity, insurance, education, and geographic context, it offers a roadmap for designing more inclusive and effective health policies. These insights are especially pertinent as Morocco advances toward its ambitious goal of achieving universal health coverage by 2025, ensuring that this national commitment translates into fair and meaningful improvements in health for all segments of society.

Ethical Considerations

This study uses secondary data from the 2014 National Household Consumption and Expenditure Survey conducted by the High Commission for Planning. The dataset is publicly accessible, fully anonymized, and contains no personal identifiers, and the research did not involve any direct interaction with individuals. For these reasons, formal ethical approval was not required, and the High Commission for Planning granted an exemption.

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