Patterns and Determinants of Poverty Transitions among Poor Urban Households in Nairobi, Kenya

By

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Abstract
We examine the patterns and determinants of household transitions into and out of poverty among the urban poor in two Nairobi informal settlements in Kenya between 2006 and 2009. We find worsening household poverty overtime, with the proportion of poor households increasing from 51.2 percent in 2006 to 54.9 percent by the end of 2009.Over the period, 34.5 percent of households remained in chronic poverty, 20.4 percent fell into poverty, 16.7 percent successfully escaped poverty and 28.4 percent fully remained out of poverty. We identify slum of residence, gender and marital status of household head, attainment of at least secondary education by household head, consistent engagement in formal employment, household size and the incidence of births within a household, among key determinants of household poverty transitions. Our results underscore the need for anti-poverty policy options around provision of economic opportunities, addressing disadvantages of female-headed households, promoting access to at least secondary education, smaller household norms and birth control among the urban poor. While the outcomes are consistent with some national trends, the need for the design and implementation of slum and sub-group specific anti-poverty policies are significantly evident.

Introduction

In sub-Saharan Africa, reports on the various dimensions of poverty are consistently bleak and widespread (nearly half of the population are living on less than 1 US dollar per day and three quarters on less than 2 US dollars per day), with gloomy prospects for improvement in the near future (World Bank, 2000/2001). Although most countries in the region have enjoyed steady economic growth since the mid-1990s, it has not been sufficient to make rapid progress in reducing poverty (DFID, 2007). According to the World Bank, sub-Saharan Africa's poverty level has increased since the early 1990s and will decrease only sluggishly in the next decade should current trends persist (World Bank, 2003). Following an increasing attention to address extreme poverty and hindrances to economic development by 2015 in line with the Millennium Development Goals, understanding both the dynamics and determinants of poverty have continued to be a relevant research agenda in the region. The role of the population factor on the region's poverty profiles has attracted increased research and policy attention in recent years. In particular, high fertility and unprecedented growth in the proportion of young people, as well as

the continued high levels of migration to urban destinations in the search for livelihood opportunities have been linked to high dependency ratio, increasing urbanization of poverty, and significant proportions of the urban population living in debilitating environments in over-crowded slums and sprawling shanty towns around major cities in the region (UN-HABITAT, 2003; APHRC, 2002).

In Kenya, development efforts since independence in 1963 has emphasized poverty reduction through economic growth, employment creation and the provision of basic social services (Kimalu et al. 2002). Although the basic commitment to fight poverty has remained strong, these efforts have not, for the most part, yielded the expected results with more than half of the country's population mired in poverty (Kristjanson, 2009). Nairobi, Kenya's capital city is growing at an estimated annual rate of 5 percent and apart from natural increase, much of this growth is linked to rural-urban migration, with many new migrants living in one of the city's many informal settlements (APHRC, 2002). The Kenya Bureau of Statistics conservative estimates indicate that 30 percent of the city's 3.1 million residents live in slums (Gulyani and Taludar, 2008). A corpus of recent studies have highlighted the debilitating living conditions of the city's poor and their significant disadvantages in health, reproductive health and living conditions relative to rural dwellers (APHRC, 2002; UN-Habitat, 2003; Zulu et al. 2002; Kyobtungi et al. 2008). Data from these studies have provided reasonably good accounts of who the urban poor are, where they live, the multifaceted nature of urban poverty, as well as the inadequacies, indignities and sufferings commonly experienced by the urban poor (Government of Kenya, 2007). Notwithstanding, significant knowledge gaps remain, particularly the critical questions of why some people succeed in escaping from poverty, while others are left behind,

and the reasons why people remain out of poverty, while others fall into poverty in a seemingly homogeneously poor and geographically compacted space?

Researchers in the region have also identified considerable deficit in the conceptualization, measurement, knowledge of determinants, and overall nature of poverty, with poverty alleviation programs frequently running into implementation crises due to weak conceptualization and inability to properly characterize the poor (Schultz, 2005). Addison et al. (2009) identified poverty dynamics and multidimensionality measurement of poverty as two of the fronts on which poverty research needs to focus, if we are to dramatically deepen our understanding of why poverty occurs, and significantly improve the effectiveness of poverty reduction policies. The need to focus on *poverty dynamics* — over the life-course and between different social groups, highlights a wide acceptance that static analyses have limited explanatory power and may conceal the processes that are central to chronic poverty and/or its elimination (Addison et al. 2009). Understanding these dynamics remains essential for Kenya in the renewed push to achieve the poverty reduction goals spelt out in the MDGs and Kenya's Vision 2030.

Also the need to move efforts to measure poverty dynamics beyond mere income and consumption to more *multidimensional concepts and measures* is now firmly embedded in the policy discourse, and Günther and Klasen (2007) have underscored the importance of non-income poverty dynamics in our understanding of chronic poverty. Barrett et al. (2006) provided empirical evidence that household welfare dynamics differ significantly depending on whether an income-based measure is used versus an asset-based welfare measure.

Building on the foregoing, this study investigates household poverty dynamics in terms of patterns of transitions in and out of poverty and their determinants in two of Nairobi's many informal settlements. We conceptualize poverty at the household level in terms of a composite

variable computed from a battery of wealth indicators obtained from the longitudinal Nairobi Urban Health and Demographic Surveillance System (NUHDSS) that include: asset ownership, expenditure on consumables, monetary income, and housing characteristics, using Principal Component Analysis (PCA).

The significance of our study is premised on the relatively little research on urban poverty in sub-Saharan Africa, which reflects in part the historical focus of both development agencies and policy makers on rural poverty, given that the majority of the population resided in rural areas, that rural residents are relatively worse-off socio-economically on average, and partly because of lack of empirical evidence on urban slum dwellers and the difficulties of collecting data in such settings (Greene and Merrick, 2005). Further, most analysis of poverty utilizes data from large scale national surveys such as the World Bank Living Standards Measurement Surveys, the DHS and MICS, which allow some level of disaggregation at regional level, but unable to allow distinctions between urban residents living in informal settlements (slums) from those living elsewhere. Using the longitudinal framework of the NUHDSS data to measure poverty provides a unique opportunity to particularly focus on the urban slums and allows for the calculation of relative household rankings as a time-varying outcome, with the strength of comparability of data from the same household at different points in time. Our use of a composite measure of poverty speaks to the fact that households' current living standards and deprivation levels do not only depend on the flow of income received per week, month, or even year but also on their command over resources (assets, wealth and other durables), as well as their ability to take advantage of economic opportunities particularly in the labor market (Addison et al. 2009). Given that poverty can be transitory or chronic; our study enables a distinction between the characteristics of households in transient poverty and those in chronic

poverty over a time period. This distinction is necessary because policies to address chronic poverty have been shown to be different from those aimed at reducing transient poverty and the duration of time spent in poverty has been linked to important implications for individual or household future strategies ((Addison et al. 2009; Carter and Barrett, 2006; Barrett, 2005).

Determinants of Poverty Transitions: Theoretical and Empirical Review

In a nationwide study that reconstructed the sequence of events preceding escape from poverty across Kenya, Kristjanson et al. (2010) identified diversification of income sources, which involved progress in small community-based enterprises, obtaining a job, most often in the informal sector, increasing land under cultivation, crop diversification and commercialization as the five category of factors associated with household escape from poverty in both urban and rural Kenya.

The relationships between family size, maternal health, child health and survival, and household economic welfare have long been a population theme in the demographic and development literature, and recently emphasized by the Millennium Development Goals (UNDP, 2003). Researchers have pointed to reduced fertility and improvements in adverse reproductive health indicators as most likely to lead to better economic outcomes. Merrick (2002) identified women with better education and smaller families as more likely to be healthier, engaged in income-generating activities and to invest in the education and health of their offspring. The hypothesized negative correlation between family size and welfare is thought to be a contributing factor in human capital formation and economic growth (Bloom and Canning, 2007). More recent investigations have indicated that rapid childbearing inhibits economic prosperity and that these effects tend to persist over the life course (Bloom and Canning, 2007; Aassve et al. 2005).

Several other studies have linked the high fertility levels in SSA to important consequences not only on the health and survival of children but also on the economic wellbeing of households and their descent into poverty (Kristjanson et al. 2010; Mason and Lee 2004; Merrick 2008; Rustein 2005).

Loss of employment is identified as a major reason for descending into poverty, particularly in urban areas, as well as the direct effects of health and related shocks, including the death of a bread winner. Studies in Kenya and Madagascar provided empirical support that health shocks related to HIV/AIDS, malaria, tuberculosis are the most common reason households become and stay poor (Barrett et al. 2006; Kristjanson et al. 2010). In urban Ethiopia, Gebremedhin (2006) found significant association between different socioeconomic characteristics and poverty levels, with households consisting of casual workers and female heads engaged in household business activities relatively poor, while households where the household head has completed college or university education suffer from the least incidence of poverty.

In traditional neoclassical growth theory, education is emphasized as the main source of human capital formation and ultimately a crucial tool for growth and poverty avoidance. Education remains the key not only to employment in the formal sector but also to various opportunities to better living conditions, though access to education remains uneven for both men and women (Ajakaiye & Adeyeye, 2001). It is expected, therefore, that living conditions of households will vary across different levels of educational attainment, with higher education more likely to predict better living standards across the life course and over time. It is important to note that in urban Kenya, while education was linked to formal sector employment in the

private or public sector, it had limited independent impact in household escape from poverty following the dearth of formal sector job opportunities (Kristjanson et al. 2010).

With increased opportunities for female educational attainment and consequent increased probability of female labor force participation in the region (Aromolaran, 2004), child birth and related child-care burdens is judged a potentially important issue for households, particularly if headed by women. Generally, child care is considered a major barrier to employment for most female heads of households and a major drain on earned income. In most two-parent households, child-care time and cost are shared by both parents and in an extended family system, relatives might aid child care. In single parent households, however, these responsibilities rest with the single parent alone particularly those headed by women in urban areas (Gage et al. 1997). Consequently, the structure of households and the number of young children who are wholly dependent on adults for accessing care and resources are found to significantly determine household poverty (Mberu, 2007).

Recognizing that the studies on which some of these indicators were found significant were cross sectional studies based on nation-wide surveys, our study contributes to the perspective that poverty is not static but changes as a result of seasonality, climate variability, household-level demographic shocks (such as illness and death), lifecycle changes and public policies. Consequently, we map the implications of education, household structure, fertility and mortality experiences within urban poor households for household poverty transitions over the period 2006 through 2009.

Data and Methods

To explore the trajectory of poverty and the underlying causes at the household level among the urban poor in Nairobi informal settlements, we use data from the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) implemented in 2 slums of Nairobi: Korogocho and Viwandani. The surveillance covers about 60,000 people living in about 23,000 households monitored since 2002. On average, about 56% of the population and 62% of households reside in Viwandani. The surveillance involves visits to all household once every four months to record all demographic events, including births, deaths and migratory moves. Additional data on household amenities and income are collected once a year for all households residing within the surveillance areas. These data include access to such basic households amenities as tap water, toilet facilities; ownership of livestock, durable household assets, as well as income and key expenditures. However, the annual expenditure surveys was implemented only since 2006, hence to reflect our focus on the multi-dimensionality of poverty, we use data collected on households between 2006 and 2009, which allows us to aggregate a composite measure of household poverty that includes annual household expenditure.

Following the high levels of population mobility within the settlements, our analysis utilizes household wealth information for 6,635 households where data was available for four consecutive years (2006, 2007, 2008 and 2009). To check for selection bias, we use simple regression to test the characteristics of households and their heads that fitted our selection criteria and those that were left out in the years they have relevant data. We found no significant differences in their characteristics, leading us to conclude that the 6,635 households selected for study is a true reflection of the households in the two informal settlements.

The main outcome variable is household poverty status (poor and non-poor), defined by a composite index computed from a battery of indicators that include: ownership of household

assets, expenditure on consumables, monetary income, and housing characteristics. A weighted value was computed from these wealth-related indicators using Principal Component Analysis (PCA). To identify a poor and non poor household, the generated weighted variable was categorized into two using a median score where all household with a score above the median were categorized as non poor and those that had scores below the median value were tagged poor.

Building on literature and available data, the predictor variables used in the study are divided into two groups: characteristics of households and their heads. Heads of households are chosen as reference persons following the pattern set by other studies in the region, and the assumption that the economic circumstances of the head of a household is the most single important indicator of household's economic status (McLanahan & Booth, 1989; Mberu, 2007). The characteristics of a household head includes: gender (male/female), age in years, education level, marital status between 2006-2009 (in union, widowed/divorced/separated, never married, other patterns), religion (Catholic, Protestant, Islam, Others, no religion), ethnicity (Kikuyu, Luhya, Luo, Kamba, Others) and type of economic activity over the period (own business, formal employment, informal work, Others). Household characteristics that were used in the analysis include: average household size between 2006-2009 (0-2, 3-4, 5+), total number of births in a household (0, 1+), the total number of deaths in a household over the period (0, 1+), and place of residence (Viwandani and Korogocho).

In our analysis of poverty dynamics, we use a poverty transition matrix to trace four patterns observed over the four years: remaining in chronic poverty, moving out of poverty, falling into poverty, and remaining consistently out of poverty. We use bivariate and multivariate

statistical tools to evaluate the effect of the characteristics of households and their heads on the observed household poverty trajectories.

Results

Overall, Table 1 shows that the number of households living in poverty in the period 2006-2009 rose in these communities. Among the 6,635 households studied, 51.2 percent were poor in 2006 but rose to 55 percent by the end of 2009. This outcome is driven by 34.5 percent of households that remained poor throughout the study period and the 20.4 per cent of households, who were non poor in 2006, but fell into poverty by 2009. Conversely out of the 3,238 (48.8 per cent) households who were non-poor in 2006, only 1,882 (28.4 per cent) consistently maintained the same status by 2009, while 1,111 (16.7 per cent) households who were poor in 2006 successfully escaped poverty by the end of 2009.

[Table 1 about here]

In terms of determinants, Table 2 shows significant higher levels of poverty in Korogocho than Viwandani slum. Among households living in Korogocho, 49.4% remained in chronic poverty relative to 14.2% of households in Viwandani over the period. Conversely, while over 50% of households in Viwandani remained out of poverty, only 12.3% of households in Korogocho remained out of poverty. Similarly, while higher proportions of households in Viwandani transited out of poverty, more of the households that fell into poverty were resident in Korogocho.

Consistent with previous findings of widespread feminization of income or consumption poverty in SSA linked to the economic disadvantages of female-headed households, we find that 58.7% of female headed households were chronically poor, relative to 27.5% of male headed

households between 2006 and 2009. Similarly, while 34.3% of male-headed households consistently remained out of poverty, such advantage was the privy of only 7.7% of female-headed households.

We identify an inversely linear relationship between the educational attainment and household transition in and out of poverty. As educational attainment increases, the proportion of households in chronic poverty monotonically decreased. Among households whose heads have no formal education, 53% of them remained in poverty over the entire four-year period. However, this proportion drops to 37.5% and 24.2% among households whose heads attained primary and secondary or higher education respectively. This pattern is fully reversed when we examine households that stayed out of poverty over the entire observation period. While only 10.8% of households whose heads has no formal education remained out of poverty, the proportion rose to 24.9% for those with primary education and further to 38.8% for heads with secondary education or higher.

We identified a notable variation between Christians and Muslims in terms of their transitions in and out of poverty. Over the 4 year period for which we have complete data, 54.6% of Muslim households were in chronic poverty relative to 31% of Christians of all denominations. Conversely only 7.7% of Muslim households remained out of poverty all through the period, relative to 31% of Christians.

[Table 2 about here]

On the one hand, the relationship between the age of head of household and persistent household poverty presents a u-shaped curve, with higher proportions of households with the youngest and oldest heads more likely to be chronically poor. On the other hand the relationship

between the age of a household head and consistently staying out of poverty over the entire period represents an inverted u-shaped curve.

Table 2 identified ethnic dimension of poverty among poor Nairobi households, with about 49% and 33% of Kikuyu and Luo households respectively in chronic poverty between 2006 and 2009, compared to only 18% of the Kamba. Conversely, the Kamba and the Luhya maintain greater advantage in staying out of poverty through the period of observation, with 47% and 31% of Kamba and Luhya households respectively relative to 17% of Kikuyu and 21% of Luo. The magnitude of transition out of poverty is generally low across all ethnic groups.

In terms of the role of household size, Table 2 shows evidence that large households constitute the highest proportion of the chronically poor and those that fell into poverty over the period, while smaller sized households constitute the majority of those who remained out of poverty. Table 2 also shows that households that experienced childbearing or mortality over the period were more likely to be in chronic poverty relative to those who had no births or deaths.

Further, the analysis identifies the potential protective role of marriage for household poverty; with households whose heads are currently in union the least likely in chronic poverty and more likely to remain out of poverty. This advantage is greatly enhanced when compared to households whose heads are widowed, divorced or separated, who are grossly over represented among households in chronic poverty over the observation period.

Finally, as expected households whose heads are engaged in own business and in the informal sector over the four year period are mostly in chronic poverty relative to households whose heads are in formal employment over the entire period. The reverse is the case among households that remained out of poverty, with 58% of heads in formal employment able to keep

their households out of poverty relative to 20% of those in own business and 24% of those in the informal sector over the four year period.

Multivariate Analyses Results

In Table 3, we present the net effects of key predictors of household poverty transitions. We fitted a repeated binary logistic regression model, for the four outcomes considered. In Model 1 we present the comparison between households in chronic poverty over the four years of observation and households that were poor at the beginning of the observation but transited out of poverty by the end of the period. Model 2 compares households that remained out of poverty throughout the observation period and those who were non poor in 2006 but fell into poverty by 2009. Model 3 compares households in chronic poverty and those that remained out of poverty over the period.

Transition out of poverty

Model 1 identifies slum of residence, ethnic origin, marital status, gender, and age of head of household as key independent predictors of household transition out of poverty over the four-year period.

Consistent with its strategic location near the major source of employment in the city (the industrial area) and being home to young low-income more educated industrial workers (Ezeh et al. 2006), households resident in Viwandani who were poor in 2006 are 4.6 times as likely to transit out of poverty in 2009 as those living in Korogocho slum.

The gender of the head of household is a significant net predictor of household transition out of poverty over the period. Male-headed households are 1.93 times more likely to transit out

of poverty than female-headed households. Other characteristics of household head- age and marital status- are also significant independent predictors. The propensity to move out of poverty consistently increased as the age of heads of households increased. In fact households whose heads were aged 30 years or less have a forty-one percent disadvantage in transiting out of poverty relative to households whose heads were aged 50 years and above. The marital status of heads of households, in terms of being widowed/divorced/separated or single, showed significant disadvantage for transiting out of poverty relative to heads who were in union over the period.

An important demographic predictor of household transition out of poverty is the fertility experience within a household over the four years. Households that were poor and experienced at least a birth are 0.19 times less likely to move out of poverty over the period relative to households that experienced no birth over the same period. Our analysis finds a net significant ethnic effect in household transition out of poverty. The Kamba households are 1.64 times as likely as the Kikuyu to transit out of poverty in the observation period. The Luhya and the Luo households are 1.43 and 1.34 times as likely as the Kikuyu to transit out of poverty as well.

[Table 3 about here]

Falling into Poverty

On falling into poverty, the result in Model 2 identified the slum of residence, ethnic origin, average household size, marital status, gender and age of head of household over the observation period as net predictors.

Relative to households that were non poor in 2006 and remained out of poverty over the observation period, the slum of residence is significantly a determinant of falling into poverty. Consistent with the finding in Model 1 households living in Viwandani slum are four times less likely to fall into poverty than those living in Korogocho slum. Similarly, male-headed

households are three times less likely to fall into poverty than female headed households. Also, there is a linear relationship between the age of household head and household propensity to fall into poverty, with younger ages a significant net disadvantage. Households of the youngest heads (30 years or less) are 2.04 times as likely to fall into poverty as the oldest reference category (51 years+). As in Model 1 the Kamba are the least likely to fall into poverty relative to the Kikuyu, the Luhya and the Luo ethnic groups. As expected, as household size increased, household propensity to fall into poverty increased. Relative to smaller households of 2 persons or less, households of 3-4 persons are 1.39 times and large households of 5 persons and above are 1.55 times as likely to fall into poverty over the four-year period. Finally, we find that households whose heads are single or widowed/divorced/separated are two times as likely to fall into poverty as where heads were married over the study years.

Staying out of poverty versus remaining in chronic poverty

In terms of staying out versus in chronic poverty over the period, Model 3 identified the place of residence, ethnic origin, average household size, educational attainment, marital status, gender, age, birth or otherwise within the household and the nature of employment of head of household over the period as independent predictors. Living in Viwandani gives households that were non-poor in 2006 a 15.2 times advantage of staying out of poverty over the four years period than living in Korogocho. Male-headed households have a 6.79 times advantage of staying out of poverty between 2006 and 2009 if they were non-poor at the beginning of observation. Having at least secondary education and being employed in the formal sector for the entire four years gives households a 1.24 times and 1.48 times propensity of staying out of poverty respectively, if they were non-poor at the beginning of 2006. Conversely being a Muslim

or having no religion, being among the youngest heads of households, belonging to a large household of 5 persons or more, giving birth to least one child relative to having none and being single, widowed or separated are independent disadvantages in staying out of poverty over the periods of our observation. Relative to Catholics, Muslims and household heads with no religion are about four and three times less likely to stay out of poverty over the observation period respectively. Though this outcome may require further and closer scrutiny, it may be a pointer to the advantages associated with religious social networks in the area of poverty alleviation. Relative to the oldest heads of households, heads that are aged 31-40 years are twice less likely to stay out of poverty or more likely to remain in chronic poverty over the period and the disadvantage increased to over three times for the youngest heads aged 30 years or less. As household size increased, the propensity to remain out of poverty increasingly slips away and this disadvantage stood at 44% for the largest households in the slums with five persons or more. We observe a 30% disadvantage on the propensity to stay out of poverty in the event that there is at least a birth within a household relative to if there was none over the four-year period. Finally the important implication of current marriage union in staying out of poverty was confirmed by the disadvantages of households whose heads were divorced, separated or single relative to those whose heads were in union over the study period.

Discussions and Conclusions

In this study, we use the unique longitudinal data from the Nairobi Urban Health Demographic Surveillance System to examine the patterns and determinants of household transitions into and out of poverty across two Nairobi informal settlements in Kenya between 2006 and 2009. Our study covered 6,635 households interviewed three times a year with household wealth data being

collected at least once in the year, whose records were complete across all multidimensional measures of poverty over every year of the study period. The main outcome variable is level of household poverty (poor and non-poor), measured by a composite variable computed from a battery of wealth indicators and weighted using the Principal Component Analysis. We employ repeated binary logistic regression models to examine four poverty trajectories over the four-year observation period: chronic poverty, transition into poverty, transition out of poverty and staying consistently out of poverty.

In general we identify both an increasing household poverty between 2006 and 2009. In terms of household transitions in and out of poverty presented in Models 1 and 2 of Table 3, we identified slum of residence, gender, age, marital status, average household size and ethnic origin of the head of household as key predictors. To these factors were added the birth or otherwise of at least a child in a household over the four-year period, educational attainment and religious affiliation of head, including whether a household head was consistently engaged in formal employment or otherwise, as determinants of whether a household consistently stayed out or remained in chronic poverty.

Our finding on the advantage of households resident in Viwandani slum relative to Korogocho is consistent with its strategic location near the major source of employment in the city (the industrial area) and being home to young low-income more educated industrial workers (Ezeh et al. 2006). This speaks unequivocally not really about physical location but to the primary role of economic opportunities in addressing urban poverty, particularly the positive role of location of industries in addressing local livelihood opportunities.

The significant disadvantage of female-headed households in staying in than out of chronic poverty and in the transition into than out of poverty, is consistent with the primary

outcomes of a growing body of research in the region, which underscores a significant degree of female disadvantage in household living conditions and associates the increasing concentration of poverty among women to the rise in the proportion of households headed or principally maintained by women (Gebremedhin, 2006; Lloyd & Gage-Brandon, 1993). Other studies have explained the strong and widespread feminization of income or consumption poverty by women having lower chances for independent escape from poverty, in part because of their large share of domestic commitments, which prevents them from seizing new and profitable opportunities as readily as men (Haddad, 1991). While these explanations were not specific for the urban poor, they shed crucial light on the enduring female economic disadvantage in the region and provide cues not only for broader studies of the socio-cultural barriers to women's climb out of poverty, but also for policy interventions to address them.

The consistency of the results of our analysis on the role of marital status speaks to the advantage linked to the role of spouses in pooling resources in terms of household amenities and possessions to provide household sustenance, particularly in an uncertain environment. This outcome is also consistent with the advantage of two-parent over marginal household structures found by previous studies in the region (Mberu, 2007). Household division of labor and complementarities in production between spouses will imply that the total product of a married couple is larger than the sum of the outputs of each produced separately and economies of scale in consumption suggest that a couple can achieve the same utility with less combined expenditure than the sum of their individual consumption if living apart (Becker, 1981).

Our findings show that the propensity to move out of poverty consistently increased as the age of heads of households increased, with households whose heads were aged 30 years or less having a forty-one percent disadvantage in transiting out of poverty relative to households

whose heads were aged 50 years and above. The higher vulnerability to poverty for younger heads of households may be partly related to conclusions by previous studies about the accumulated survival advantages and resilience of older heads over the life course in a generally debilitating and challenging economic environment (Mberu, 2006).

We identify significant net importance of ethnic origin in transition into and out of poverty, with the Kamba, followed closely by the Luhya, and then Luo households consistently in advantage than the Kikuyu. While this outcome is counter-intuitive in terms of the general perception about the economic advantage of the Kikuyu over other groups, previous studies have linked landlessness in places of origin to urban slum residence and poverty, a challenge more likely for Nairobi urban poor Kikuyu than other groups (Ezeh et al.2006).

While the size of households, which is a good proxy for economic dependency, did not show consistent significant results, all the outcomes point to the expected direction. Moreover, relative to smaller households of 2 persons or less, large households of 5 persons or more is both a significant predictor of falling in and remaining in chronic poverty and a hindrance to staying out of poverty. Similarly, households with at least a birth over the period are less likely to move out of poverty and less likely to remain out of poverty over the period relative to households with no births. While this may not be a sufficient basis to suggest that the poor should not give births, it is definitely a pointer that having at least a birth in a situation of significant poverty may compound household poverty by increasing both the vulnerability to chronic poverty and lesser prospects of moving out. This is an intuitive finding following the need for care and related expenditures associated with infant care.

The roles of education, consistent formal employment and religion were significant but marginal. While households whose heads attained at least secondary education are more likely to

escape poverty, the role of education was significant only in staying out of poverty over the entire study period. The overall weakness of education finds support in evidence from a previous nationwide study that though education was almost invariably associated with getting a formal sector job in Kenya, but relatively few formal jobs opportunities diminishes the independent role of education as a pathway out of poverty (Kristjanson et al. 2010). Muslims relative to Christians are less likely to be non-poor at the beginning of the study and that disadvantage is significantly less likely to be overcome over the four-year study period. While this outcome may reflect the economic reality of marginal groups, it may also be a pointer to the role of advantages associated with religious social networks in the area of poverty alleviation that requires closer scrutiny. Employment in the formal sector over the four year period shows a consistent and intuitive outcome in terms of transition in and out of poverty, although its effect was only significant for staying out of poverty over the entire observation period. In the context of dominant informal employment, low wages and the near total absence of social safety nets for vulnerable households, it is logical that households were most likely kept out of poverty, if heads were consistently engaged in the formal sector over the four years.

In conclusion, our study contributes to a nuanced understanding of the ups and downs of household welfare status among Kenya's urban poor. The varying levels of poverty across different informal settlements, linked to their different employment potentials and economic profiles, underscore the need for different and contextualized levels of policy and program interventions. While the outcomes are consistent with some national trends, many slum specific reasons are significantly evident, which reiterates the need for the design and implementation of sub-group differentiated anti-poverty policies. Further, our distinction between households in chronic poverty and those in transient poverty, who typically move into and/or out of poverty

over time, is also a positive platform for tailored policies. For those experiencing short spells of poverty, intervention programs may include unemployment insurance and benefits, re-skilling, microcredit, temporary social safety nets and health services, while addressing households in chronic poverty may be through deeper structural programs such as provision of access to education, addressing landlessness and infrastructural development (Addison et al. 2009).

Finally, that formal employment, education, family size and number of births in a household are significant predictors of moving into or out of poverty, highlights not only the demographic dimension of poverty dynamics but also the import of continued anti-poverty policy options that addresses the creation of employment, provision of education and family size reduction programs for the urban poor.

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Appendices

Table 1 Poverty Transition Patterns of Urban Poor Households, 2006-2009 (N: 6,635)

Poverty Transition Patterns	Year 2006	Total (n)	Year 2009	Total (n)
Poor -> Poor	51.2%	3,397	34.5%	2,287
Poor -> Non-Poor			16.7%	1,111
Non-Poor -> Poor			20.4 %	1,355
Non-poor -> Non-poor	48.8%	3,238	28.4 %	1,882

Source: Authors' Analysis of NUHDSS Data, 2006-2009

Table 2 Transitions in and out of poverty among the Nairobi urban poor, 2006 – 2009.

Transition patterns	Households in chronic poverty	Households moved out of poverty	Households that fell into poverty	Households that remained out of poverty	Total (%)
Slum Site* **					
Korogocho	49.4	15.6	22.7	12.3	3,817
Viwandani	14.2	18.4	17.3	50.1	2,818
Gender of Household Head* **					
Female	58.7	16.2	17.4	7.7	1,477
Male	27.5	16.9	21.3	34.3	5,158
Educational Attainment* **					
No education	53	23.3	12.9	10.8	583
Primary	37.5	16	21.6	24.9	3,676
Secondary+	24.2	16.4	20.6	38.8	2,312
Religion* **					
Catholic	32.3	16.7	20.2	30.7	1,991
Protestant	31.4	15.8	21.7	31.2	3,486
Islam	54.6	26.6	11.3	7.5	443
No Religion	46.5	13.7	21.9	18	183
Others	36.4	15.9	29.6	18.2	44
Age of Household Head* **					
30-	40.8	18.5	19	21.7	904
31-40	29.9	15.3	21.1	33.8	2,391
41-50	31.1	17	21.3	30.7	1,787
51+	41.8	17.7	19.3	21.3	1,553
Ethnic Origin* **					
Kikuyu	48.6	17	17.1	17.4	2,280
Luhya	28.3	15.9	25	30.9	946
Luo	33.2	13.1	32.9	20.7	1,051
Kamba	17.8	17	18.2	47	1,433
Others	33.3	20.8	13.2	32.8	925
Average Household Size* **					
Small Households (1-2)	34	17	18	30.9	2,856
Medium Households (3-4)	32.5	15.3	23	29.2	2,343
Large Households (5+)	38.4	18.7	21	21.9	1,436
Number of births					
None	34.0	16.7	19.9	29.4	4,302
1+	35.3	16.8	21.4	26.5	2,333
Number of Deaths* **					
None	33.9	16.8	20.4	28.9	6,212
1+	42.3	16.2	21.3	20.3	414

Marital Status* **					
In union	25.4	17.2	21.6	35.9	4,237
Widowed/Divorced	55.6	15.4	18.1	10.9	1,246
Single	47.3	16.7	17.2	18.9	863
Other patterns	38.1	16.7	20.4	28.4	289
Type of Employment * **					
Own Business	42.5	17.8	19.8	20.0	1,738
Formal sector employment	10.6	15.0	15.6	58.8	969
Informal sector employment	34.9	15.6	25.4	24.2	2,124
Others	39.1	18.1	17.8	25.1	1,804
Total	2287 (34.5)	1111 (16.7)	1355 (20.4)	1882 (28.4)	6635(100)

Source: Authors' Analysis of NUHDSS Data, 2006-2009. *** $\chi^2 < 0.001$.

Table 3 Logistic regression models predicting poverty dynamics in Nairobi Informal Settlements between 2006 and 2009.

Transition patterns	Transition out of poverty (Model 1)	Transition into Poverty (Model 2)	Non-Poor versus chronic poverty (Model3)
Slum Site of Residence			
Korogocho	1.00	1.00	1.00
Viwandani	4.56***	0.23***	15.2***
Gender of Household Head			
Female	1.00	1.00	1.00
Male	1.93**	0.33***	6.79***
Educational Attainment			
Primary or Less	1.00	1.00	1.00
Secondary+	1.09	0.98	1.24*
Religion			
Catholic	1.00	1.00	1.00
Protestants	0.95	0. 97	1.07
Muslim	0.85	1.61	0.20***
No Religion	0.61	1.53	0.48**
Others	1.21	0.84	1.34
Age of Household Head			
51+	1.00	1.00	1.00
41-50	1.05	1.08	1.08
31-40	0.75**	1.39**	0.70**
30-	0.60***	2.06***	0.25***
Ethnic Origin			
Kikuyu	1.00	1.00	1.00
Luhya	1.45**	0.80	2.87***
Luo	1.30*	1.12	2.63***
Kamba	1.656***	0.74**	2.88***
Others	1.59**	0.59***	2.59***
Average Household Size			
Small Households (0-2)	1.00	1.00	1.00
Medium Households (3-4)	0.98	1.39***	0.98
Large Households (5+)	0.97	1.55***	0.56***
No of births in household			
None	1.00	1.00	1.00
1+	0.81	1.09	0.71***
No of deaths in household			
None	1.00	1.00	1.00
1+	1.01	1.22	0.78
Marital Status of HH			
In union	1.00	1.00	1.00
Widowed/Separated	0.59***	1.51**	0.35***
Single	0.52***	1.50**	0.38***
Other patterns	0.82	1.47	0.94
Type of Employment			
Own Business	1.00	1.00	1.00
Formal sector employment	1.21	0.76	1.48*
Informal sector employment	0.92	1.20	0.93
Others	0.99	1.02	0.87
Log likelihood	-1874.18	-1832.25	-1618.00
N=	3, 393	3, 233	4, 161

p<0.05, ** p<0.01, ***p<0.001