Grandparent Co-residence, Grandchildren Development, and the Consequences of Increasing Adult Disability: Cross-National Evidence from DHS Data

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Abstract

In many modern populations, grandparents are increasingly becoming the primary caregivers of their grandchildren. This phenomenon has renewed interest in the role that grandparents play in within-family intergenerational transfers, their determinants, and their effects on family members, especially grandchildren. However, despite an extensive literature on the effects of grandparental care on their grandchildren survival and development, few studies have considered how forces driving the demographic and epidemiological transitions shape the demography of grandparenthood and intergenerational transfers. In particular, there are conditions in modern human populations that play an important role in reducing the potential supply and quality of grandparental care. This is that older adults may be exposed to an increased burden of disease and disability that compromises their health status and/or their physical capacity to provide support. In this study, we use cross-national DHS data from low- and middle-income countries to estimate, first, the association between grandparents' co-residence and grandchildren nutritional status for each country and year. Second, we employ multilevel models and country-year level data on the prevalence of chronic conditions from the Global Burden of Disease Study, to assess the degree to which geographic and temporal variation in the effect of grandparent's co-residence is associated with countries' demographic and epidemiological characteristics that may affect older adults and their capacity to care for grandchildren.

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Extended Abstract

Motivation and Purpose of the Study

The demography of grandparenthood is a topic increasingly studied within the literature of kinship size, composition, and relations among its members. An important part of this literature focuses on the likelihood, intensity, and quality of grandparental care as well as on other domains of intergenerational transfers between grandparents, children, and grandchildren (Margolis, 2016; Arpino et al., 2018; Puglisi, 2022). As a result of unprecedently rapid demographic and epidemiological changes, the demography of grandparenthood must be continuously updated to account for impacts of sudden shifts in family structure, changes in co-residence rules and practices, and redefinition of roles and functions of kin, especially grandparents, who co-reside (or not) within a household (Margolis & Wright, 2017).

Because in many modern populations, grandparents are increasingly becoming the primary caregivers of their grandchildren (Bengtson, 2001), an emerging topic within the demography of grandparenthood is the existence, nature, and size of transfers that flow from grandparents to grandchildren. However, despite a large body of literature on the effects of grandparental care on their grandchildren survival, growth, and development, only a handful of studies evaluate how modern demographic and epidemiological regimes shape the demography of grandparenthood and intergenerational transfers (Margolis & Wright, 2017). In this study, we use Demographic and Health Surveys (DHS) to examine the relationship between grandparent's co-residence and grandchildren early physical growth and development and investigate how this association varies across countries and over time. In particular, we assess whether geographic and temporal variation in the effect of grandparent's co-residence is associated with countries' demographic and epidemiological characteristics that may affect older adults and their capacity to care for grandchildren.

Theoretical Framework and Research Questions

There are two key demographic forces that shape the demography of grandparenthood and the association between grandparents' co-residence and grandchildren early physical growth and development: fertility decline (quantum and timing) and early and adult survival gains (Leopold and Skopek, 2015; Arpino et al., 2018). Through different mechanisms, both these determinants influence the fraction of grandchildren who avoid early death, the availability of grandparents, and the length of time these will survive past older adult ages and overlap with their grandchildren. On the one hand, lower fertility reduces the number of grandchildren in the family, raise the ratio of potential grandparents to surviving children, and postpone the timing of grandparenthood. On the other hand, lower mortality among grandchildren and grandparents translates into larger potential 'demand' for grandparental care and longer duration of grandparental 'supply' (Margolis, 2016; Arpino et al., 2018).

But modern demographic regimes also have a significant downside. Although some of the above described demographic determinants create potentially favorable environments for significant and sustained deployment of grandparental care, there are other conditions to which modern human populations are increasingly exposed that play an important role in *reducing* the potential supply and quality of grandparental care. This is that the older adult population in the post-demographic transition stage experience an increased burden of disease and disability that compromises their health status and/or their physical capacity to provide support (Margolis and Wright, 2017). In fact, we know that rapid emergence of obesogenic environments in modern human populations is the trigger behind the increase of child and adult obesity alike.

Furthermore, trailing behind the obesity epidemic is the rapid diffusion of adult chronic conditions directly linked to obesity, namely, Type 2 Diabetes (T2D), heart disease and stroke, and disability. Because grandparents' health is the material foundation on which intergenerational transfers involving them take place, it is unclear whether grandparental care is at all possible and/or beneficial for grandchildren under these modern epidemiological regimes.

It turns out that countries most affected by these environments overlap with those where grandparental effects on their grandchildren development are suspected to have been historically stronger. For example, during the last decades, the prevalence of adult female obesity has increased rapidly in most African countries as they attained levels of obesity prevalence exceeding 10 percent among adult females around 2015. Other low- and middle-income countries have reached even higher levels that hover in the range of 20 to 30 percent. Two decades ago, obesity was a rare trait in these populations, never exceeding 5 percent among adults. Worse yet, prospects are bleak, for the current children obesity epidemic will augment chances of future adult prevalence as child and adult obesity are highly correlated. The pathologies associated with obesity are manifested mostly during late adulthood and, particularly, at post reproductive ages. Although these pathologies do cause losses of years of life, their most insidious effect is increased disability and loss of healthy years of life post-reproduction.

There are multiple mechanisms by which grandchildren can benefit from grandparental care directly and indirectly. First, grandparents contribute directly by reducing exposure to risks and supplying assistance during caring situations such as child sickness and accidents. Second, they free parents from childcare duties and increase the time they can devote to other labor-intensive activities. The expected outcomes of this kin collaboration are reductions of early childhood mortality and improved child physical (and cognitive) growth trajectories and development (Lahdenpera et al., 2004). If indeed grandparents' care improves chances of grandchildren's development, then households where grandchildren and grandparents co-reside (or where there is regular, unobstructed contact between them) should experience better child development outcomes. Conversely, households where grandchildren and grandparents' co-residence and frequent contacts are preempted by cultural barriers, physical separation or impaired grandparental health and physical abilities should experience worst outcomes.

The existing body of literature on grandparental effects reveals mixed results suggesting that the effect of grandparents' co-residence varies across countries and over time (Lahdenpera et al., 2004; Sear et al., 2000; Sadruddin et al., 2019; Schrijner & Smits, 2018). Our main thesis is that this geographic and temporal variation may be the result of differential effects that depend on context-specific characteristics that adversely affect the older adult population, including the prevalence of chronic conditions and disability. In particular, we ask how and to what extent the increased obesity-related burden of chronic illness and disability among older adults affects the physical growth and development of grandchildren? Can the health and disability burden associated with modern human obesity weaken or reverse the benefits of grandparental care in low-income countries where it is still prevalent? And, in what populations is this alteration of traditional patterns most strongly manifested?

Data

We propose to use IPUMS-DHS data for all countries and years available in order to estimate the association between grandparents' co-residence and grandchildren physical growth and development across countries and over time. We seek to identify not only geographic

variability and time trends, but also determinants of this diversity across world regions. Of particular importance is the association between the grandparent's co-residence effect and obesity prevalence in the older adult population as well as of associated increased risks of chronic illness and disability to assess the potential impact on the persistence and efficacy of the grandparent's effect in populations where it is still prevalent. To investigate these relations, we merge country-year level data on the prevalence of chronic conditions from two the Global Burden of Disease Study with the IPUMS-DHS files.

Analytical Strategy

We compare grandchildren under five years old who are exposed to grandparents' co-residence with those who are not. Given the hierarchical structure of the data, we estimate multilevel models where grandchildren are nested within country-year combinations. The dependent variable is grandchildren nutritional status (severe or moderate stunting). The main predictor is grandparent co-residence. Additionally, we control for grandchildren demographics (sex and age) and household characteristics (area of residence and wealth index). At the country-year level, we use a number of controls but focus on the main indicator of older adult burden of disease, namely, the number of years lived with disability due to metabolic risk factors among the elderly (risk factors include diabetes, LDL cholesterol, obesity, systolic blood pressure, osteopenia, and kidney dysfunction).

First, we will estimate country-year specific coefficients and produce maps for the association (positive, negative, or null) between grandparents' co-residence and grandchildren nutritional status. Second, to examine the relation with the indicator of disability due to metabolic risk factors among the older adult population, we estimate a cross-level interaction between grandparent's co-residence and each population level indicator of disability.

Preliminary Results

Using IPUMS-DHS data from 30 African countries (81 country-years observations), Figures 1 and 2 show linear probability model estimates and 95% confidence intervals for the association between grandchild nutrition with grandmother and grandfather's co-residence, respectively. We find large variation across countries with coefficients ranging from -0.05 to 0.04, indicating a mix of negative, null, and positive associations. Among the countries that consistently show positive associations are Nigeria and Rwanda and countries with consistent negative associations include Zambia and Benin. In general, grandmother effects tend to be larger and more significant than grandfather effects, which is consistent with what prior studies have found in this region (Schrijner & Smits, 2018).

We then show in Figure 3 correlates between point estimates of the association between grandparent's co-residence and grandchild nutrition with the indicator of disability due to metabolic risk factors. We find a negative correlation (-0.22 for grandmother's co-residence and –0.25 for grandfather's co-residence), indicating that in populations with a higher number of years lived with disability among older adults, both the grandmother and grandfather effects tends to be negative. In contrast, for lower levels of years lived with disability, the grandmother and grandfather effects tend to be positive for grandchildren's nutrition. These preliminary results suggest that cross-national and temporal variation in the association between grandparent's co-residence and grandchild nutrition may be linked to context-specific conditions that affect older adults and their capacity to care for their grandchildren.

Figure 1. Association between grandmother's co-residence and grandchild's nutritional status (no stunting).

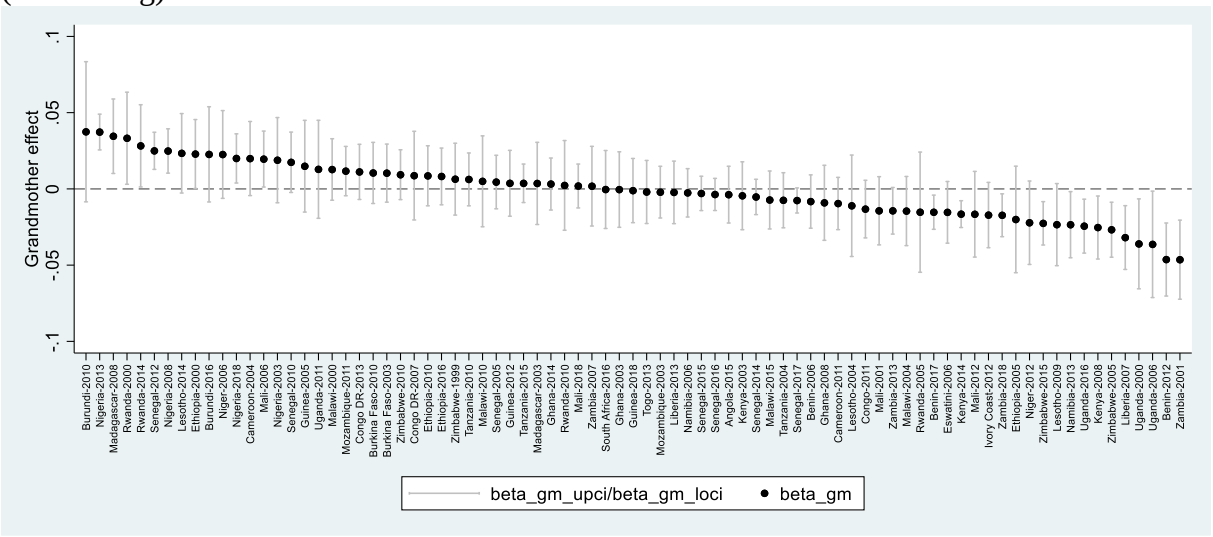


Figure 2. Association between grandfather's co-residence and grandchild's nutritional status (no stunting).

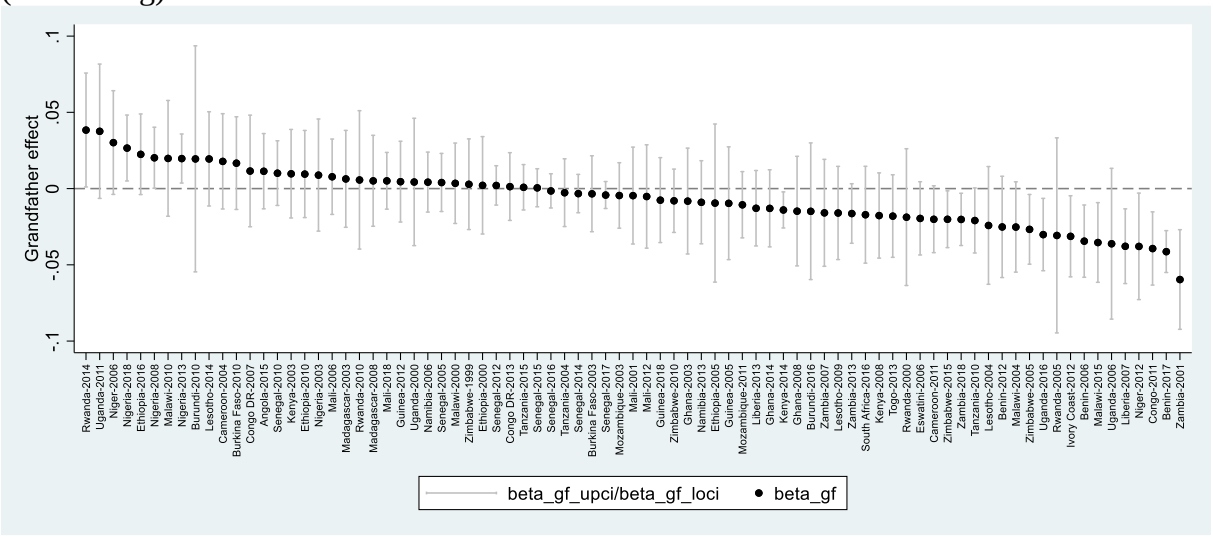
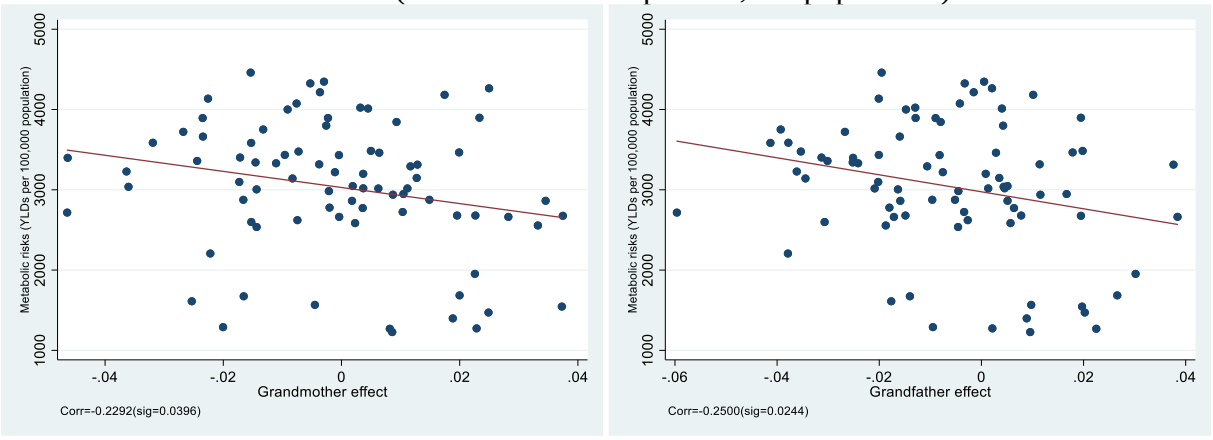


Figure 3. Correlation between the grandparent's effect and Years Lived with Disability (YLD) due to Metabolic Risk Factors (measured in YLD per 100,000 population).



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