

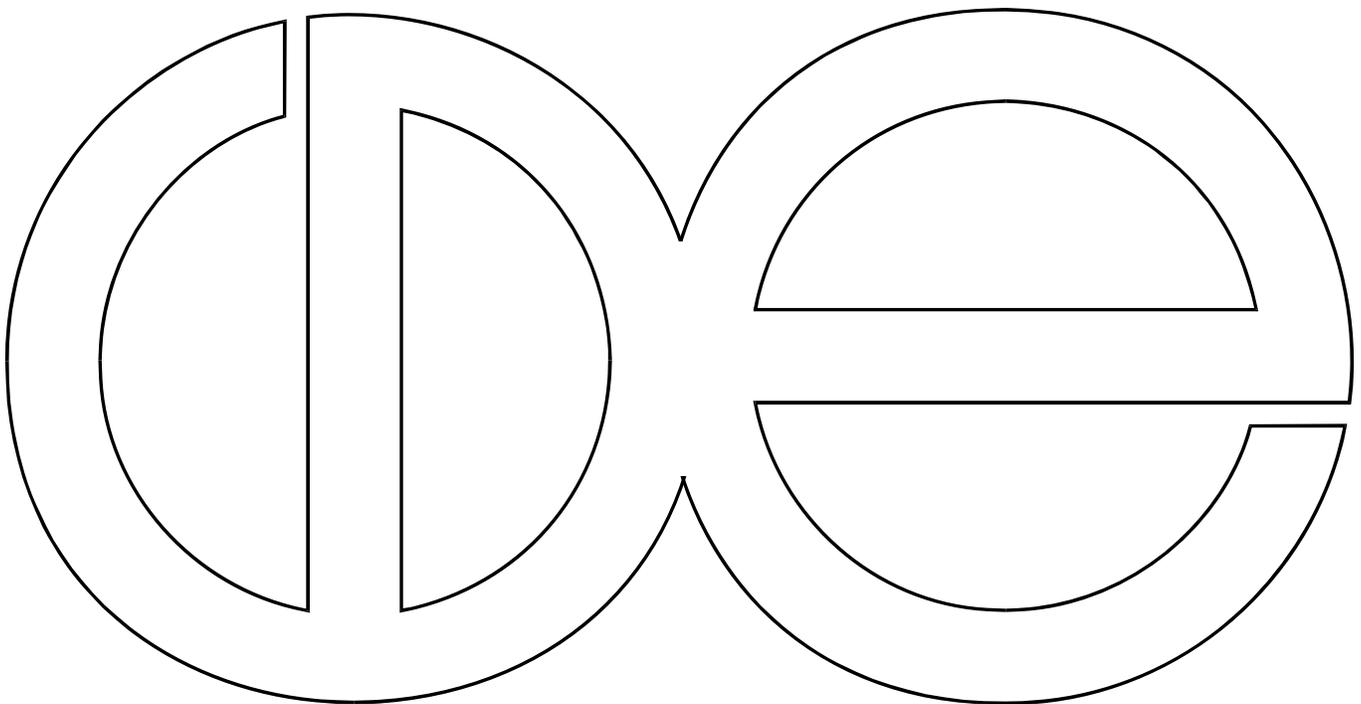
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**Family Structure and Child Health in Argentina**

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# FAMILY STRUCTURE AND CHILD HEALTH IN ARGENTINA

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## **FAMILY STRUCTURE AND CHILD HEALTH IN ARGENTINA**

We explore the influence of family structure on the nutritional status of Argentinian children aged 2-5 years with data drawn from the nationally representative National Survey of Health and Nutrition (2004-5).

We use logistic regressions to model two outcomes: stunting (low height-for-age) and overweight (excessive weight-for-height).

For the stunting model, we find that two-parent families have significantly better outcomes when they have relatives in residence with them and that single parenting per se does not have adverse effects. The beneficial role of relatives is reversed for overweight: Children living with one or two parents have significantly higher odds of being overweight when relatives are present in their household. Single parenting is associated with lower odds of overweight but only if relatives are not part of the residential family.

## INTRODUCTION

Family structures have deep cultural roots and are continuously shaped by demographic, social, and economic changes. In the United States, family patterns have been changing since the second half of the last century (Bianchi and Casper, 2000 and 2005), and in Latin America the diversification of family structures is ongoing at a very rapid pace (Ullmann et al., 2014).

The effect of family structure on offspring's well-being has earned a considerable amount of research in the U.S. (Cherlin, 1992; McLanahan, 2004; McLanahan and Sanderfur, 1994). A number of studies analyzed the influence of family type on outcomes such as children's educational achievement (Aquilino, 1996; Cavanagh et al., 2006), cognitive skills (Carlson and Corcoran, 2001), and overall well-being (Amato, 2005; Brown, 2004; Langton and Berger, 2011; Thomson and McLanahan, 2012). Of particular importance is the association between family structure and children's physical and mental health and their access to health care (Gorman and Braverman, 2008; Leininger and Ziol-Guest, 2008). According to Carr and Springer (2010), family is among the most powerful influences on health as it provides economic, social and psychological resources, along with strains, that can protect or may threaten, the health of its members.

In the United States, researchers have used a variety of datasets to analyze linkages between family and aspects of child health. American children are living in increasingly complex family structures, due in part to high rates of divorce and re-marriage and the high prevalence of "single" parents with serious cohabiting partners (Carr and Springer, 2010). Using data from the National Health Interview Survey 2001-2007, Blackwell found that children living in nuclear families—that is, two married adults and their children—were generally healthier, more likely to have access to health care, and less likely to have behavioral difficulties than children living in non-nuclear families. Children in single-parent families were more likely to have at least one chronic condition than children from other family types (Blackwell, 2010). Bramlett and Blumber used the 2003 National Survey on Children's Health and found that children living in step, single-mother, or grandparent only families had poorer health than children living with two biological parents, even adjusting for demographic differences. However children living in single-father families generally did as well or better, for mental and physical health respectively, than children living with both biological parents (Bramlett and Blumber, 2007). Schmeer used longitudinal U.S. data from the Fragile Families and Child Well-Being Study and found that children living with a mother who recently dissolved a union or who had been living without a partner for at least 2 years are at an increased risk of gaining excessive weight compared with those in stable married two-parent families. In addition, children living with single mothers who entered a new union had significantly healthier weight/height trajectories than those whose mothers remained single or who recently became single (Schmeer, 2012).

Existing research on the health of young children in less developed countries is focused on nutritional status. This is due to the fact that the combination of under-nutrition and infectious disease is the major health problem for lower income countries (Evans et al., 2005), while overweight is becoming one of the top causes of disease burden, especially in middle income countries (Caballero, 2005). Malnutrition occurs when a diet has either insufficient nutrients or

some gross imbalance/overabundance of certain nutrients so that it causes health problems. It is a category of disease that includes both under-nutrition and over-nutrition (Dimosthenopoulos, 2010), although malnutrition is frequently used to mean just under-nutrition. Commonly used measures of under-nutrition are stunting (short height-for-age) and wasting (low weight-for-length/height) (Martorell and Young, 2012). Overweight and obesity (excessive weight-for-height) are used as indicators and measures of over-nutrition.

Child health has been recognized to influence health and achievement across an individual's life course and nutritional status is a very important indicator of child health. The consequences of malnutrition before age five are diverse. Stunting often results in IQ deficits and poor school performance (Caulfield et al., 2006), poor psychological functioning in adolescence (Walker et al., 2007), and impaired health and educational and economic performance in adulthood (Dewey and Begum, 2011). Wasting is usually a consequence of a high incidence of infectious diseases, particularly diarrhea, or insufficient food intake and in turn undermines the functioning of the immune system (WHO, 1995). Overweight in children sets them up for obesity and other health risks throughout childhood and into adulthood (Reilly and Kelly, 2011). It is associated with several adverse health outcomes, including Type 2 diabetes and breathing disorders during sleep (Biro and Wein, 2010; Daniels et al., 2005; Daniels, 2006).

In Latin America and the Caribbean, the relationship between family structure and young children's nutritional status has been studied by relatively few researchers using datasets of varied size and representation. In this sparse research, though, Desai (1992) studied families from Brazil, Colombia, and the Dominican Republic. While taking Desai's results cautiously due to the small sample sizes, these results show that a mother's marital status matters for child nutrition even after controlling for family size, possessions, and parental education. In general, children whose mothers are in consensual unions are the most likely to be stunted; children living with legally married mothers are the least likely to be malnourished. Using 1996 data from Jamaica (765 children under age 5), Bronte-Tinkew and DeJong (2004) found that children living in a single-parent, cohabiting couple or extended households (as opposed to living in a married couple household) are at a greater risk of stunting. However, the negative effect of extended households—that is, head, partner, children and other relatives or non-relatives—on stunting is completely accounted for by household size, parents' education, and other socioeconomic indicators. Fernald and Neufeld used a rich dataset for rural, low income Mexican children collected in 2003 (7,555 children ages 2-6) that included the mother's characteristics (anthropometric, schooling, vocabulary). Using maternal characteristics and other standard controls, they found that both paternal absence and household size increased the risk of stunting as well as concurrent stunting and overweight but not of overweight. Parental marital status did not play any significant role (Fernald and Neufeld, 2007).

Like other Latin American countries, Argentina is going through sociocultural processes that affect family structure and composition and are consistent if not with all at least with some of the characteristics of the second demographic transition (Arriagada, 2004; Cabella et al., 2004). This transition is characterized by increases in divorce rates and cohabitation, diversification of residential arrangements, lower and delayed fertility, delayed marriage/cohabitation, and decreases in the prevalence of two-parent families (Esteve et al., 2012; Ullman et al., 2014).

In Argentina particularly, researchers have studied different aspects of child nutrition, including nutritional status (Bassett et al., 2013; Bejarano et al., 2005; Bolzán et al., 2005; Duran et al., 2011; Kovalskys et al., 2011; Oyhenart et al., 2007), its causes (Calvo et al., 2005), consequences on cognition, visual, and oral health (Lancuza, 2010; Acosta et al., 2009; Martínez and Lucas, 2004; Páez et al., 2008), and links to socioeconomic status (Mercer et al., 2005). However, we are unaware of any study that has analyzed the influence of family structure on the nutritional health of preschool-aged children. Our work aims at filling this gap and contributing to our understanding of the role of family structure as a social determinant of child nutrition in developing country settings.

This study uses a rich dataset and logistic regressions to assess the role of the family in preschool children's nutritional status in Argentina. Our analysis sample of slightly over 11,600 children ages 2-5 is drawn from the nationally representative 2004-5 National Survey of Nutrition and Health (Encuesta Nacional de Nutrición y Salud: ENNyS). Focusing on stunting and overweight, we explore whether single parenthood is associated with better or worse outcomes and whether relatives (overwhelmingly grandparents) reinforce or reverse such associations.

Briefly stated, we obtain two important results regarding the links between stunting and family type: Two-parent (couple) families have significantly better outcomes when they have relatives with them, and single parenting per se does not have adverse effects. The beneficial role of relatives is reversed for overweight: Children living with one or two parents have significantly higher odds of being overweight when relatives are present in their household. Single parenting decreases the odds of overweight –as compared to two-parent families- but only if relatives are not part of the residential family.

## **DATA AND MEASURES**

Data. We use data from the 2004-5 National Survey of Health and Nutrition (ENNyS) developed by the Argentine Ministry of Health. This rich dataset contains information on health, anthropometry, nutrition, and socioeconomic indicators for four groups: children 6-23 months, children 2-5 years, women 10-49 years, and pregnant women. The data were derived from a probabilistic, multistage sample designed to be representative at the national, regional or provincial level depending on the particular group and indicator. Only cities with at least 5,000 inhabitants were considered for the sample selection, and some of the children/women share the same household. Additional details about the sample procedure and data collections are provided in Ministerio de Salud (2007).

Our analysis focuses on children 2-5 years of age with information conducive to the identification of family structure. Although there are more than 15,000 preschool children with weight and height data in the ENNyS sample, family structure can be identified for only 12,363 children. Of these, 11,664 and 11,625 had complete data (including head of household's schooling) for our multivariate analysis of stunting and overweight, respectively. Prevalence

rates of stunting and overweight among children with complete data were not different than those among children for whom complete data were not available.

### Measures.

*Family and Household.* We use the concepts of *Household* and *Family* as defined by Argentina's National Institute of Statistics and Censuses (Instituto Nacional de Estadísticas y Censos: INDEC) (Torrado, 2005).

A *household* is a group of individuals (related by kinship or not) residing together and sharing food expenses or other "vital" expenditures. The definition excludes domestic workers and includes one-person households. The *Head of Household* is chosen by "recognition" by all other household members. A *family* consists of two or more individuals from the same *household* who are related by birth, marriage, or adoption. The definition is extended to include cohabiting couples.

The ENNyS data includes a residential household roster that we use to identify a child's family. This identification is only possible when a child in our dataset is the *Head of Household's* child, and consequently our analysis is restricted to these children (about 80% of total number of children ages 2-5 in the dataset). We also decided to exclude a very small number of children living in households that include non-relatives (150 cases).

As a result, all *households* in our analysis sample are *families*, and the two concepts can be used interchangeably. We use *household* to remain true to ENNyS terminology in all cases except when talking about a child's *family type*.

### *Family Type*

Research in the U.S. and in some developing countries found significant differences in health outcomes for children living with cohabiting versus married parents (Bronte-Tinkew and DeJong, 2004; Desai, 1992; DeVos, 2001; Schmeer, 2011). Unfortunately, our dataset does not have information regarding the legal status of cohabiting partners, and we are unable to distinguish between married and unmarried couples. We classify families in four groups (1) couple: head of household, partner and child/children, (2) couple and relative/s: head of household, partner, child/children and relative/s, (3) single parent: head of household and child/children, and (4) single parent and relative/s: head of household, child/children and relative/s. The category "relative" includes a child's grandparents, aunts/uncles and other kin (e.g., cousins, great grandparents).

### *Child nutrition/health*

Growth assessment using anthropometric indicators provides the best measurement of nutritional status for infants and preschool children since inadequate food intake combined with infections invariably affects growth (Shetty, 2002).

We use two indicators to measure very different aspects of nutrition and health: height-for-age and weight-for-height. A child's height-for-age is the result of genetics and net nutrition since birth. Deaton (2007) defines net nutrition as the difference between nutritional/food intake and

the losses to activities and disease. Periods of low net nutrition cause periods of slow growth that are often not followed by a complete catch-up once net nutrition returns to normal levels (Bronte-Tinkew and DeJong, 2004). Weight-for-height, on the other hand, is a measure of current nutritional status and also a net measure reflecting the balance between current intakes and claims on those intakes (Fogel, 1994). Appropriate height-for-age can measure long term growth, while appropriate weight-for-height reflects proper body proportion (WHO, 1986).

To compare children of different age and gender, we combine anthropometric data with date of birth to create a height-per-age z-score (*HAZ*) and weight for height z-score (*WHZ*) using the World Health Organization guidelines (WHO, 2006). A z-score of 0 is the median of the reference population of children from Brazil, Ghana, India, Norway, Oman, and the United States (the WHO Growth Standards median). A z-score of -1 indicates that the child is 1 standard deviation below the reference-population median for his/her gender and age.

A child is considered *stunted* (or with chronic malnutrition) if his/her z-score of height-for-age (*HAZ*) is less or equal to -2 and *overweight* if his/her z-score of weight-for-height (*WHZ*) is bigger or equal to 2 (WHO, 2006).

#### *Household Characteristics*

##### *Household size (adjusted)*

We adjust household size taking into consideration its demographic composition to obtain an “adult equivalent” measure or *Adjusted Household Size*. Following the guidelines from Argentina’s National Institute of Statistics and Censuses (INDEC), we use an equivalence scale that reflects age-gender specific energy/caloric needs (INDEC, 2012; Morales, 1998). We acknowledge that our measure is narrowly based on food consumption needs and that a more general equivalence scale could be used to capture the overall cost of supporting a household and the degree of economies of scale in consumption (O’Donell et al., 2008; Deaton and Zaidi, 2002, Gasparini et al., 2010).

##### *Head of Household Schooling*

Because in many cases the child’s mother cannot be identified with certainty, we use the head of household’s schooling as a proxy for the educational attainment of the person who will most likely make decisions affecting the entire household. Four standard education categories are considered: primary incomplete, primary complete, secondary incomplete, and secondary complete or more.

##### *Wealth Index/ Segments*

We construct a summary measure of a household’s economic well-being using information on housing characteristics and physical assets. Filmer and Pritchett (2001) have shown that such asset indexes are robust and reliable and provide good estimates of long run wealth since they are less sensitive to transitory fluctuations than are consumption expenditures. We follow their procedure to create a *Wealth Index* using information from the entire children’s dataset from the ENNyS (children ages 6 months to 5 years).

The following eight variables were used to construct the *Wealth Index*: dwelling type, floor material, number of people per room (excluding kitchen and bathroom), water source, toilet type, electricity, refrigerator, telephone (land line). Although our sample includes only urban areas, some dwellings are located in “villas de emergencias/asentamientos” (shanty towns with minimum or no access to standard city services). Consequently, these broad asset indicators capture quite well the variation in economic well-being within the sample.

We use the method of principal components to assign weights and construct an index with mean 0 and standard deviation of 1. For interpretation ease, we shift the index by 5 units so that all values are positive. Our resulting *Wealth Index* has a mean of 5 and a standard deviation of 1. We assign households in our sample of interest (children 2- 5 years) to quartiles to create four wealth segments. These wealth segments are not exactly balanced since there are a large number of repeated values making the cutoff points difficult.

#### *Food Assistance*

There were several government sponsored programs in place at the time of the data collection. These programs targeted children, women, and older adults providing food (in-kind), vouchers, milk, or access to meals in a community setting (Maceira and Stechina, 2008). A specific poverty measure was used as a qualifying criterion. There were also programs sponsored by NGO's, religious organizations, and others. Our variable is a dummy that has a value of 1 if someone in the household received any type of food assistance in the previous three months.

## **STATISTICAL METHODS**

Descriptive Statistics. Table 1 presents the descriptive statistics for the sample. There are 12,363 children ages 2-5 with identifiable family structure and either height-for-age or weight-for-height scores in our sample. Of these, 11,664 and 11,625 had complete data (including head of household schooling) for our multivariate analysis of stunting and overweight, respectively.

/Table 1 around here/

Prevalence rates of stunting and overweight are 7.5% and 9.2% respectively. Two other standard malnutrition indicators are underweight (WAZ<-2) and wasting (WHZ<-2), but the prevalence rates among these children are quite low (2.1% and 1.2 % respectively). Figure 1 shows the various prevalence rates for males and females.

/Figure 1 around here/

The fore mentioned stunting and overweight prevalence rates are slightly lower than the ones for the entire ENNyS's sample (ages 6 months-5 years), which are 8% and 10.4% respectively (Duran et al., 2009). Prevalence estimates of stunting and overweight for children five or younger are 13.9% and 7.1% for South America and, 15.7% and 6.9% for Latin America and the Caribbean respectively (de Onis et al., 2010 and 2012). Argentina has lower stunting and higher overweight rates among young children than its neighbors.

Researchers have also identified particular patterns of stunting and overweight in the region. Using data for all available South American countries around 2000, Duran et al. (2006) report a high prevalence of overweight in subgroups with both high and low prevalence of stunting. Fernald and Neufeld (2007) document high rates of concurrent overweight/stunting in rural low-income Mexican children (2-6 years). The prevalence rate of overweight with concurrent stunting in our sample is very low (0.67%), and we are unable to identify any patterns.

All children in our sample live with one or both parents, and their households do not include non-relatives. Relatives (mainly grandparents) reside with children and their parent/s in about 13% of the cases. The largest percentage of children (78%) live with just both parents (and siblings if any) and 10.4% with both parents and other relative/s. Slightly less than 9% of children live with just one parent and about 3% with one parent and relative/s.

Single parents with one or more children live with relative/s in higher percentages than couples do (25% versus 12%), and single parent families are headed by women in 88% of the cases. Two-parent families are overwhelmingly headed by men, for what may be due to cultural reasons since males are almost routinely designated as heads of household. The median-adjusted household size (in adult equivalent units) is 3.4, and about 39% of them receive some type of food aid.

Head of household schooling information is only available for 11,715 children. The large majority of them live in households where the head has at least some high school education, but 10% of them live in households where the head has not completed primary school.

The household wealth index captures important differences in economic well-being among households. We identified strong gradients for stunting and overweight prevalence that are not presented here: Stunting decreases with wealth while overweight increases.

Multivariate Analysis. Two logistic regression models are used to analyze the influence of family structure on the health of preschool children. In the first one the dependent variable indicates whether the child is stunted or not, while in the second it indicates whether he/she is overweight. The main independent variable is family type, and we adjust for age, sex, and household characteristics (size, head of household schooling, wealth, and food assistance). Because a household could contribute with more than one child, we correct for cluster effects. In addition, after fitting the models we obtain mean predicted probabilities over the estimation sample for different family types.

We have 11, 664 complete observations for the stunting model and 11,625 for the overweight model. Table 2 shows the odds ratios and standard errors for the two logistic regressions when

*couple* is the reference category for family type. The reference categories for head of household education and wealth segment are secondary complete or more and top wealth segment, respectively. Table 3 shows the odds ratios by family type when the reference categories are switched to *couples & relative/s* and *single*. Figure 2 shows our models' mean predicted probabilities (and 95% confidence intervals) by family type.

/Tables 2 and 3 around here/

We also ran models without adjusting by wealth and food assistance, which we do not present here but to which we refer in our discussion section.

Stunting. There are two important findings regarding the links between family types and stunting: Two- parent (couple) families have significantly better outcomes when they have relatives with them, and single parenting per se does not have adverse effects.

Children from two parent families with relative/s have significantly lower odds of stunting than those from single parent or two-parent families (36% and 27% lower respectively). Or, putting it differently, if a child was moved from a two parent family with relative/s to a single or two parent family, his/her odds of stunting would increase by 55% or 38% respectively.

A striking gradient by family type is predicted by our model (Figure 2). The average predicted probability of stunting if all children from our sample were living with both parents and relative/s is 5.8%; with a single parent and relative/s, 6.9%; with just two parents, 7.7%; and with only a single parent, 8.6%. This result suggests a beneficial effect on stunting of living with relative/s in both one- and two-parent families.

/Figure 2 around here/

Our results show that children in larger, less educated, and poorer households have higher odds of stunting. Belonging to a family with a head of household with primary incomplete (complete) instead of one whose head completed secondary school or more increases a child's odds of stunting by 57% (23%). Children in the lowest wealth segment have the highest odds of stunting, with 83% higher odds than those in the top segment.

Our results signal that food assistance (by the government or other organizations) is primarily going to the intended recipients (those in the lowest wealth segments). Receiving food assistance is a strong indicator of socioeconomic status and children in this category have 72% higher odds of stunting than those who do not receive food assistance.

Overweight. The beneficial effect of relative/s is reversed for the case of overweight, and residing with just one parent has a protective effect. Females and children from households receiving some form of food assistance have lower odds of overweight.

Being in a family with two parents and relative/s increases the odds of child overweight by 26% compared to children living with two parents and no relatives. Children living with only a single parent have significantly lower odds of being overweight, 29% lower than those living with two parents. Adding relatives to a single parent household increases the odds of a child being overweight by 53% and by 77% if a partner and relative/s are added.

Children in the lowest wealth segment have the lowest odds of overweight (21% lower odds than those in the top segment) and receiving food assistance decreases the odds by 20%.

The lack of an effect of head of household education on overweight suggests that the education effect is being captured by the other two indicators of socioeconomic status (wealth and food assistance). We confirm this by running a logistic regression (not reported here) without wealth or food assistance, and in this case all the education categories are significant.

A significant overweight gradient by family type is also predicted by our model (Figure 2). The average predicted probability of overweight if all children from our sample were living with both parents and relative/s is 11.3%; with a single parent and relative/s, 9.9%; with just two parents, 9.2%; and with only a single parent, 6.7%. This result suggests that living with relatives is associated with child overweight in both one- and two-parent families.

## **DISCUSSION**

This study investigated the associations between family structure and nutritional status among Argentinean preschool children. We examined two malnutrition indicators: stunting (for under-nutrition) and overweight (for over-nutrition).

Our main findings focused on the role of relatives and the advantage/disadvantage of single-parent families that in our sample are overwhelmingly female headed. We found that resident relatives in two-parent families have a mixed effect on child malnutrition: They decrease the odds of stunting but increase the odds of overweight. Resident relatives in single-parent families have no significant effect on stunting but increase the odds of overweight. Single-parent households –without relatives- were associated with lower odds of overweight and were not associated with higher odds of stunting (when compared to two-parent families).

Since a very high proportion of the relatives in our sample were grandparents (over 80% of families with relatives include at least one grandparent), we can relate our work to recent studies on grandparents and child nutrition. This topic has not been widely studied and comparisons with our work have to be taken cautiously due to differences in country settings, children's age, and sample size/characteristics.

Resident grandparents may play a variety of roles in a family, including preparing meals and providing informal childcare. Their attitudes and beliefs – that may or may not coincide with

those of the child parent/s – can influence young children’s nutrition and eating habits and their presence can have significant effects

Aubel’s review of the developing country literature suggests that grandparental presence may improve child nutrition by providing advice, care, and resources (Aubel, 2012). Using longitudinal data from Peru, Crookton et al. (2010) find that children who had grandparents in the home were more likely to demonstrate catch-up growth. Schmeer (2013) studied child anemia – another indicator of under-nutrition-- using longitudinal data for Mexican children (ages 3-12). She found that resident maternal grandparents have a significant beneficial effect on child anemia independent of family structure. The results from our stunting model are partially consistent with these findings since we identify a significant positive effect of relative/s on stunting but only when both parents are present.

Several hypothesis can be mentioned as possible explanations of our finding that resident relative/s increase the odds of an overweight child. Relatives (mainly grandparents) may associate heaviness at young age with optimal nutritional status, express love and caring through food and use food as an educational and emotional tool. A similar result is reported by Pearce et al. (2010) who studied a contemporary United Kingdom cohort and found an increased risk of overweight in children who are cared for by grandparents.

Our results indicated that children from single-parent families – female headed in over 86% of our cases- are not at a nutritional disadvantage compared to children from two-parent families. The findings of Bronte-Tinkew and DeJong (2004) for Jamaica and Fernald and Neufeld (2007) and Schmeer (2013) for Mexico indicate that this is not the case in their samples. Single parenting is associated with higher odds of stunting (Bronte-Tinkew and DeJong, 2004) and anemia (Schmeer, 2013). Father absence increases the relative risk of stunting and has no effect on overweight (Fernald and Neufeld, 2007). Further work is needed in this issue but a promising avenue points to the age effect since Schmeer (2013) reports that the single-mother family effects are significantly stronger in older (6-12) than younger children (under age 6) and to the socioeconomic representation of the sample.

In order to further explore the overlapping effects of family structure and economic resources on stunting, we ran our logistic regression without controlling for wealth and food assistance. The single parent category became significant in this case: Children from a single-parent family had 29% higher odds of stunting than those living with two parents and no relatives. Since the single-parent category lost significance after controlling for wealth and food assistance, we can hypothesize that the negative effect of a single-parent family on stunting is due more to its association with economic factors than single parenting per se.

We chose to use a wealth index obtained by principal component analysis as an indicator of long run economic status. We are, however, aware of its limitations, specially, that it can only be used to assess relative socioeconomic status within a population, the nationally representative children’s ENNyS sample in our case. In Argentina, families with children are over-represented in the lower socioeconomic segments; therefore our wealth segments cannot be directly matched to the country’s socioeconomic segments. Alternative indicators of well-being that are available

for our dataset (income or basic-needs satisfaction index, for example) have their own shortcomings. Howe et al. (2008), and Wagstaff and Watanabe (2003) address many of these issues.

The current study has several limitations. First, the standard limitation that although we included many controls, we cannot rule out unobserved factors that may select children into particular family types and be associated later with malnutrition. Therefore, no statements about causality can be made, and our findings should be interpreted as associations. Second, our single-parent category includes very different groups that we are unable to identify –never married, divorced, widowed – that may differ in their attitudes towards parenting and nutrition. Third, we did not study single-parent or two-parent families whose head of household was not the child’s parent or with resident non-relatives; thus, our findings cannot be generalized to these families. An additional limitation is that our sample is not nationally representative since we excluded from our analysis children from the previously mentioned family types.

Our findings provide strong evidence---based on a large and relatively recent national data -- that family structure plays a significant role in child nutrition in Argentina. This suggests that independent of wealth and education levels, having two parents and relative/s in the household can have significant effects on children’s nutritional status. The effect is a beneficial one for long term growth (adequate height-for-age) but a harmful one for body proportion (excessive weight-for-height). Our work could also contribute to the design of public health policy promoting children’s health. Our results suggest that appropriate nutritional information needs to be distributed not only to mothers/parents but also to others in the household who may be making decisions regarding food intake and preparing meals.

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**Table 1: Descriptive Statistics**

|  | N            | %    | Mean<br>(SD)   | Median | 10 <sup>th</sup><br>Percentile | 90 <sup>th</sup><br>Percentile |
|--|--------------|------|----------------|--------|--------------------------------|--------------------------------|
| Age (months)                             | 12363        |      | 43.9<br>(10.7) | 43.2   | 27.9                           | 57.7                           |
| HAZ score                                | 12321        |      | -0.5<br>(1.1)  | -0.5   | -1.8                           | 0.9                            |
| WHZ score                                | 12279        |      | 0.5<br>(1.1)   | 0.4    | -0.9                           | 1.9                            |
| Sex: male                                | 6218         | 50.3 |                |        |                                |                                |
| female                                   | 6145         | 49.7 |                |        |                                |                                |
| Stunted                                  | 925          | 7.5  |                |        |                                |                                |
| Overweight                               | 1126         | 9.2  |                |        |                                |                                |
| Stunted and Overweight                   | 82           | 0.7  |                |        |                                |                                |
| Underweight                              | 261          | 2.1  |                |        |                                |                                |
| Wasted                                   | 142          | 1.2  |                |        |                                |                                |
| <b><i>Family Type</i></b>                |              |      |                |        |                                |                                |
| Couple                                   | 9653         | 78.1 |                |        |                                |                                |
| (% female headed)                        | (10)         |      |                |        |                                |                                |
| Couple & relative/s                      | 1288         | 10.4 |                |        |                                |                                |
| (% female headed)                        | (15)         |      |                |        |                                |                                |
| Single parent                            | 1067         | 8.6  |                |        |                                |                                |
| (% female headed)                        | (89)         |      |                |        |                                |                                |
| Single parent & relative/s               | 355          | 2.9  |                |        |                                |                                |
| (% female headed)                        | (86)         |      |                |        |                                |                                |
| <b><i>Household Characteristics</i></b>  |              |      |                |        |                                |                                |
| <i>Household size (adjusted)</i>         | 12363        |      | 3.8<br>(1.5)   | 3.4    | 2.3                            | 5.7                            |
| <i>Head of Household Schooling</i>       | 11715        |      |                |        |                                |                                |
| Primary incomplete                       |              | 10.0 |                |        |                                |                                |
| Primary complete                         |              | 26.2 |                |        |                                |                                |
| Secondary incomplete                     |              | 23.9 |                |        |                                |                                |
| Secondary complete or more               |              | 39.8 |                |        |                                |                                |
| <i>Household Wealth Index</i>            | 12350        |      | 5.0<br>(1.0)   | 5.3    | 3.4                            | 5.8                            |
| 1 <sup>st</sup> Segment (top)            |              | 21.5 | 5.9<br>(0.2)   | 5.8    | 5.7                            | 6.1                            |
| 2 <sup>nd</sup> Segment                  |              | 26.4 | 5.6<br>(0.1)   | 5.6    | 5.5                            | 5.7                            |
| 3 <sup>rd</sup> Segment                  |              | 25.3 | 5.1<br>(0.2)   | 5.1    | 4.7                            | 5.3                            |
| 4 <sup>th</sup> Segment (bottom)         |              | 26.8 | 3.5<br>(0.9)   | 3.7    | 2.2                            | 4.4                            |
| <i>Food Assistance</i>                   |              |      |                |        |                                |                                |
| Receives some                            | 4771         | 38.6 |                |        |                                |                                |
| N. of observations full Stunting Model   | <b>11664</b> |      |                |        |                                |                                |
| N. of observations full Overweight Model | <b>11625</b> |      |                |        |                                |                                |

**Table 2: Logistic Regressions**

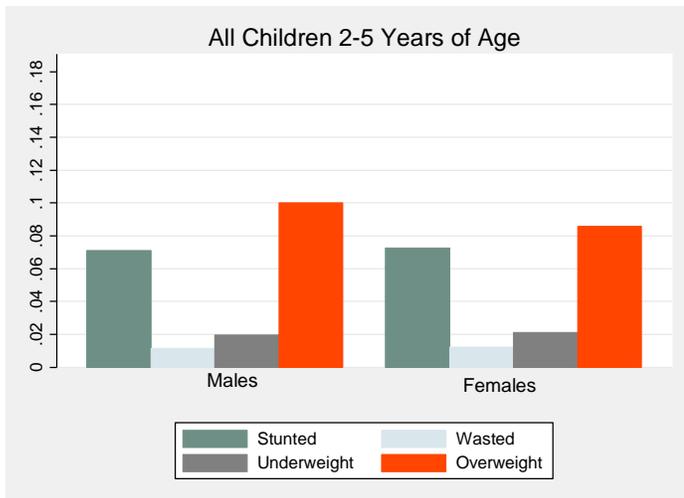
|                                    | Stunting   |           | Overweight |           |
|------------------------------------|------------|-----------|------------|-----------|
|                                    | Odds Ratio | Std. err. | Odds Ratio | Std. err. |
| Age (months)                       | 0.99*      | 0.003     | 1.01**     | 0.003     |
| Sex (1=female)                     | 1.00       | 0.07      | 0.77***    | 0.05      |
| <i>Family Type</i>                 |            |           |            |           |
| Couple & relatives                 | 0.73*      | 0.09      | 1.26*      | 0.14      |
| Single parent & relative/s         | 0.88       | 0.19      | 1.09       | 0.22      |
| Couple (ref)                       |            |           |            |           |
| Single parent                      | 1.13       | 0.14      | 0.71*      | 0.10      |
| <i>Household Characteristics</i>   |            |           |            |           |
| Household size (adjusted)          | 1.14***    | 0.03      | 0.93**     | 0.03      |
| <i>Head of Household Schooling</i> |            |           |            |           |
| Primary incomplete                 | 1.57***    | 0.19      | 0.90       | 0.12      |
| Primary complete                   | 1.23*      | 0.13      | 0.96       | 0.09      |
| Secondary incomplete               | 1.05       | 0.11      | 0.87       | 0.08      |
| Secondary complete or more(ref)    |            |           |            |           |
| <i>Household Wealth Index</i>      |            |           |            |           |
| Segment 1 (bottom)                 | 1.83***    | 0.25      | 0.79*      | 0.09      |
| Segment 2                          | 1.18       | 0.16      | 0.95       | 0.10      |
| Segment 3                          | 1.06       | 0.14      | 0.96       | 0.09      |
| Segment 4 (top) (ref)              |            |           |            |           |
| <i>Food Assistance</i>             |            |           |            |           |
| Receives some                      | 1.72***    | 0.14      | 0.80**     | 0.07      |
| N. of cases                        | 11664      |           | 11625      |           |

+ p<0.10, \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

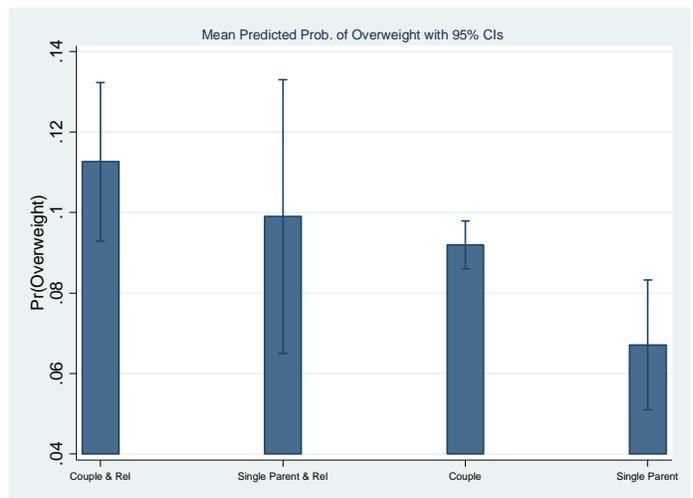
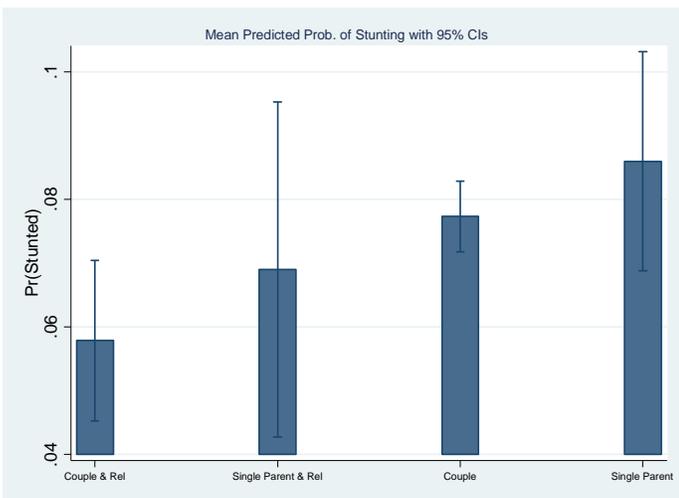
**Table 3: Differential Effects of Family Type**

| Family Type  | Odds of Stunting         |                    | Odds of Overweight       |                    |
|--------------|--------------------------|--------------------|--------------------------|--------------------|
|              | Compared to Couple & Rel | Compared to Single | Compared to Couple & Rel | Compared to Single |
| Couple & Rel |                          | 0.64*              |                          | 1.77**             |
| Single & Rel | 1.21                     | 0.78               | 0.86                     | 1.53 <sup>+</sup>  |
| Couple       | 1.38*                    | 0.89               | 0.80*                    | 1.41*              |
| Single       | 1.55*                    |                    | 0.56**                   |                    |

**Figure 1: Malnutrition Prevalence by Gender**



**Figure 2: Predicted Malnutrition by Family Type**



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