Maternal employment and childhood nutrition in Ecuador

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Abstract

This study explores the association of maternal employment on childhood nutrition in Ecuador by understanding the trade-off between the maternal time devoted to work and childcaring. I use exogenous regional variation of the labor market as an instrument. Using the National Health and Nutrition Survey 2018, I estimate the causal effect of maternal labor supply on children's nutrition outcomes based on anthropometrics measurements. Maternal employment increases the probability of having stunted children, while I have not found any effect of maternal employment on children suffering from wasting, underweight and overweight. The results are robust and account for possible endogeneity sources.

Keywords: Maternal employment; Stunting; Wasting; Underweight; Overweight.

JEL classification: I15, J22, C21.

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1. Introduction

Child malnourishment is one of the most significant health problems that Ecuador has faced in the last three decades (INEC, 2019b) and understanding the impact of malnourishment on an individual's lifetime, and on a country's economic prosperity, is of paramount importance. Childhood stunting for instance not only leads to infections, developmental deficits, brain damage, adult non-communicable diseases and early mortality, but also leads to poorer school performance, lower productivity and income as an adult (Black et al., 2008; Guerrant et al., 2013; Sudfeld et al., 2015). Additionally, children born to stunted adults are more likely to suffer from stunting themselves (Addo et al., 2015).

Despite of the public expenditure devoted to healthcare has increased dramatically in Ecuador in the last decade (The World Bank, 2020a), important child health indicators have not improved as expected. This is the case of malnutrition where the Ecuadorian National Statistical Office reported a percentage of children under five (U5) years old with stunting (children considered too short for their age) of 25% in 2012, while slightly falling to 23% in 2018. Similarly with wasting and underweight (Freire et al., 2014; INEC, 2019b), while the percentage of U5 years old children with overweight has increased in the same period. Among Latin American countries, Ecuador presents the highest value of stunting after Guatemala (FAO et al., 2018), with rates comparable to sub-Saharan countries (The World Bank, 2020b).

Policy responses that aim to tackle malnutrition in Ecuador have not succeed in reducing this health issue significantly. Government interventions such as *Programa Aliméntate Ecuador* (MIES, 2020) which includes provision of micronutrients as Iron, Zinc, Vitamin A, Folic Acid among others, have not been a structural solution to reduce malnutrition among U5 years old children. Among potential reasons, Rivera (2019) suggests an insufficient institutional articulation (e.g. nutrition and primary health programs work separately) limiting the efficient allocation of resources and management capacities between the central and local governments to tackle childhood malnourishment. In addition, the lack of government policy evaluations has restricted the analysis of the success or failure of these policies, the transparency during the policy processes and the efficient targeting intervention.

On the other hand, the participation in the labor market in the last decade has raised more remarkably among women (INEC, 2020). Here, the question of whether maternal employment is a detrimental factor for child health remains fundamental. In this context, maternal employment can provide higher levels of income to the household. This clearly allows improving families' wellbeing and therefore children nutrition and health status. However, simultaneously mothers will not be able to spend enough time to child caring, worsening children's nutrition outcomes. Further analysis of the trade-off between mothers generating additional income or providing maternal time is crucial in terms of understanding the net effect of maternal employment on children's nutritional status, which is not obvious a priori.

In addition, adverse socio-economic conditions may not allow mothers to decide whether to work or take care of their children. Surely, they are forced to work in order to provide enough income to at least escape from poverty. For these cases, the importance of capturing the effects of maternal labor supply on children nutrition is fundamental. Therefore, in this study I attempt to provide empirical evidence of the effect of maternal labor supply on children's nutritional status considering the desire of mothers to be involved in the labor force or remain economically inactive. The main objective of this study is however to find a causal effect between maternal employment and children nutritional outcomes (i.e. stunting, underweight, wasting, and overweight) accounting for possible endogeneity problems.

Previous research in this area has identified mixed effects of maternal employment on child nutritional status. On one hand, the literature identifies a positive causal effect of maternal employment on child nutritional status, after accounting for endogeneity (Anderson et al., 2003; Datar et al., 2014; Meyer, 2016); that is, maternal employment increases the probability of malnourished children. In the same line, van der Meulen Rodgers (2011) suggests that maternal employment affects children's nutrition negatively. In other words, maternal employment increases the probability to have a child with small size at birth, stunting and wasting (low weight for height). Similarly, Rashad & Sharaf (2019) provide empirical evidence regarding the causal effect of maternal labor supply on children with stunting and wasting. On the other hand, Bishop (2011) has found that working mothers improve their children's health status, relative to not working mothers. However, Mocan et al. (2015) and Greve (2011) did not observe effects of maternal employment on the nutritional status of children. Overall, while there exist a large literature documenting different findings regarding the consequences of maternal employment on children's nutrition, there is however no evidence, as long as we are concerned, on this relationship for children in Ecuador.

Based on the *Encuesta Nacional de Salud y Nutrición* (ENSANUT) conducted in 2018 and 2019 by the National Institute of Statistics and Censuses (INEC) and in line with existing literature, I find that the relationship between maternal employment and every children's malnutrition outcome, estimated by ordinary least squares (OLS), is negligible. However, these correlations do not necessarily represent a causal effect since maternal employment is endogenous due to the presence of unobserved characteristics which are correlated with the decision to work faced by the mother or simultaneity issues (Anderson et al., 2003; Bishop, 2011; Cavapozzi et al., 2021; Morrill, 2011). Therefore, I use an Instrumental Variable (IV) approach, particularly a two stage least squares (2SLS) strategy in order to estimate the causal effect of maternal labor supply on children's nutrition, considering working age mothers (active and inactive) as the population of reference in the sample. In this context, I use women's employment rate at the local-area or cantonal level as the instrument.

I argue that the women's employment rate at the cantonal level presents enough variation in maternal employment and potentially it is exogenous to the child's nutrition outcomes. Nevertheless, I provide further discussion in section 3 regarding the validity of the instrument. I also investigate whether there is a heterogeneous effect between moderate and severe stunted children caused by working mothers. Then I discuss the validity of the local average treatment effect estimated based on IV – 2SLS specification and supported by Seemingly Unrelated Regression (SUR) Bivariate Probit strategy.

My main estimates suggest that the probability of having a stunted U5 child is 25 percentage points (pp) higher for employed mothers than for unemployed or inactive mothers. This estimate is large and significant, while I do not find any evidence of the impact of maternal employment on wasting, underweight and overweight. In addition, the effect size of maternal employment is much larger for moderated stunted than severe stunted children. The IV – 2SLS results indicate that, in contrast to the OLS strategy, maternal employment increases to a larger extent the child's risk to experience stunting.

The remainder of the study is structured as follows. Section 2 discusses the empirical findings from the existing literature regarding the effects of maternal labor supply on children's health status. Section 3 details the empirical specification and methodology. Section 4 outlines the characteristics of the data used. Section 5 presents the empirical results. Section 6 presents some robustness checks, and Section 7 offers some discussion and concluding remarks.

2. Literature review

The main theoretical framework employed to analyze the relationship between parental labor supply and a child health status is the health production function developed by Becker (1965), Grossman (1972) and Jacobson (2000). Based on the micro foundations of economic theory, these authors show how households produce health outcomes via health inputs and time allocation to healthy activities through a maximization process. By adopting this theoretical framework, several studies have focused on how parental labor supply affects different child health indicators. For instance, Morrill (2011) estimates the effects of maternal employment on the health of school-age children measured as overnight hospitalizations, asthma episodes, injuries, and poisonings. In order to show causal effects, she uses an instrumental variable approach where the instrument for maternal labor supply is the exogenous variation in each child's youngest sibling's eligibility for kindergarten, since the decision to work might be inconsistent and unbiased due to unobserved characteristics (general ability level, motivation, inclinations, skill at caretaking, etc.) correlated with this variable. She finds significant and large estimates suggesting that maternal employment increases the probability of a child presenting a negative health episode.

In the present study, the main outcomes to measure children's health are related to their nutritional status. Many of the related debates have focused on their overweight status and have sought to identify maternal employment as a causal effect on this outcome. The results, however, are heterogeneous. For example, Meyer (2016) uses an IV strategy to identify the impact of maternal employment on the risk of childhood overweight in Germany, considering the number of younger siblings in the household as an instrument. She argues that the probability of being overweight increases due to maternal full-time employment. Thus, she attributes to the unhealthy dietary and activity behavior of children as a consequence of the reduced amount of maternal time devoted to them. In the same line, Anderson et al. (2003) adopting an IV strategy, suggest that American mothers that work more hours per week are more likely to have an overweighted child. Similarly, Datar et al. (2014) investigate the relationship between mother's working hours, child body mass index (BMI) and obesity using an IV approach where the instrument is the maternal work based on state-level variation in labor market conditions. The results of this research show a positive association between maternal working hours and child BMI and obesity, particularly in households with higher socioeconomic levels.

While the negative effects of maternal working on child nutrition has been established in recent studies, Leslie (1988) claims that there is little evidence of a negative effect of maternal employment on child nutrition. Indeed, Bishop (2011), using IV (economic conditions in the mother's area) and sibling-difference models for Australia, finds that part-time or full-time maternal work decreases the excess body weight in youths, relative to their not working at all. Notwithstanding, a higher income does not appear to be responsible for this effect. Furthermore, Mocan et al. (2015) study the impact of maternal earnings determined by both hours of work and wages on birth weight and gestational age of infants in the U.S. within an IV framework. They conclude that earnings have a positive but small effect on birth weight and gestational age of the newborns of low-skilled mothers, while an increase in earnings of high-skilled mothers does not have any effect on the health of newborns. On the other hand, Greve (2011) finds no effect of maternal working hours on a child overweight status in Denmark, contradicting all relevant literature from other countries.

The trade-off between maternal working time and time devoted to childcare seems to be important in a child overweight status. In this context, Cawley & Liu (2012) develop an ordinary least square (OLS) model that relates maternal employment and childhood obesity. The main finding of this study suggests that maternal employment is associated with less time spent in grocery shopping, cooking, eating with children, playing with children, supervising children and caring for children, particularly for mothers with young children (under five years old). This sheds light on the causes of childhood obesity when the mother is involved in the labor market.

Aside from overweight status, there are other indicators regarding the nutritional status of children. Most of them come from anthropometric measures and include stunting, wasting, and underweight. While a large set of the literature has focused on overweight, others study the impact of maternal employment on stunting, wasting and the underweight status of children. These studies have been carried out specially in developing countries. For instance, Rastogi & Dwivedi (2014) examine the impact of maternal employment on the nutritional status of children born in poorer and richer sections across the largest cities in India. The authors conduct a multiple logistic regression analysis to show that maternal employment in the service sector in households located in poorer areas are associated with a higher likelihood of having underweighted children as are mothers working in the agricultural sector in the richer areas. Further research provides evidence of the relationship between maternal working status and small size at birth, stunting and wasting among children under five years old in Asian countries[1] (van der Meulen Rodgers, 2011). This empirical evidence suggests a negative impact of working mothers on children's nutrition and it can be partially attributed to differences in their mother's socio-economic condition.

Finally, the most similar study to the one conducted herein is Rashad & Sharaf (2019), who investigate the impact of maternal employment on nutritional indicators, including stunting, wasting, and being underweight and overweight, among under-five-year-old children in Egypt. Due to their concern regarding the endogeneity of maternal employment, the authors perform different strategies to address this problem. Since an OLS model provides inconsistent estimates, they introduce propensity score matching (PSM) and instrumental variable techniques. This second strategy is the one which detects a causal effect of maternal labor supply on malnourished children. In line with the work of Bishop (2011) and Datar et al. (2014), the authors use the local employment condition as their instrument. This current body of evidence points towards a stronger causal effect of maternal employment on the probability of being stunted or wasted.

As pointed out by several studies, the endogeneity of maternal employment when estimating the causal effect on child nutritional outcomes has become the main concern in this stream of the literature (see, for example, Anderson et al., 2003; Bishop, 2011; Datar et al., 2014; Glick, 2003; Greve, 2011; Rashad & Sharaf, 2019). In order to address this issue, and therefore reduce the bias associated to unobserved characteristics and simultaneity in this relationship, it is noteworthy that most of the literature has implemented instrumental variable methods. This study is no exception, and section 3 discusses the empirical strategy based on this approach to find the causal effect of maternal labor supply on the probability of having a malnourished child.

[1] Bangladesh, India, Maldives, Pakistan, Nepal, Cambodia, Indonesia, the Philippines and Timor-Leste.

3. Empirical specification and methodology

3.1. Child health production function

The empirical framework of this paper is based on the child health production function, which has its foundations beginning with Becker (1965) proposing the theory of the allocation of time between work and household good's production. Therefore, households are consumers and producers and produce these goods by combining inputs and time in line with the microeconomic theory. A more general framework regarding the health production function was developed by Grossman (1972), creating a model of the demand for the commodity "good health". Jacobson (2000) extended the work of Grossman (1972) by proposing a model where the family is the producer of health. In this sense, each family member will produce not only its own but also others family members health by investing resources in health until the rate of marginal consumption benefits equals the rate of marginal net effective costs of health capital. From an empirical standpoint, Rosenzweig & Schultz (1983) use exogenous variations in health in order to conclude that the correlation between inputs and health outcomes of a hybrid[2] health production function may not be considered as causal effects. In this sense, they estimate a health production function that comes from a behavioral model in which health inputs are considered as choices as well. Hence, consistent estimates of the effect of endogenous health inputs can be achieved due to the presence of health heterogeneity. Particularly, OLS estimates may lead to a substantial underestimation of the effect of parental care on the birth weight, while IV strategy can provide consistent estimates of this effect. Similarly, Cebu Study Team (1992) addresses the unobserved heterogeneity when modeling and estimating a production function based on health input demands and health outcomes. Thus, longitudinal data methods along with IV strategy are used to provide consistent estimates and alleviating therefore, heterogeneity and endogeneity problems of important explanatory variables.

Several researchers (Bishop, 2011; Glick, 2003; Greve, 2011; Ruhm, 2008) have used this framework in order to estimate a child health production function when analyzing the relation between parental labor supply and child health. Under the child production function theory, households invest time and goods (inputs) to produce child health (output). Hence, they maximize their utility by allocating parental time and income to improve health activities such as devoting quality time to their kids, preparing healthy and nutritious food and medical care. Since time and income are scarce commodities, two different effects appear to emerge when parents, particularly the mother, face the decision to work. If mothers reduce the investment of time taking care of her children, this can be detrimental for the child health capital stock, while an increase in the time devoted to work, mothers are able to earn income and purchase more and better quality health inputs, therefore, increasing child health output. The trade-off between these two effects leads to a theoretically ambiguous net effect (Bishop, 2011).

Delimiting this framework to this study, the nutrition production function should be considered. As put by Glick (2003), this function relates the child nutritional status, measured by anthropometric indicators, to a set of health inputs such as nutrient intake, whether the child is breastfed, preventive and curative medical care, and quantity and quality of time spent by the mother or others in care-related activities. Overall, mother's time devoted to child caring activities depends on her age, experience, education, own health status as well as environmental and family factors.

[2] Hybrid-type health equation: health equations that contain one or two health inputs and prices and income variables on the right-hand side (Rosenzweig & Schultz, 1983).

3.2. *Econometric model*

In order to estimate the effect of the mother's labor status on their children's health outcomes, the key specification of this relationship is the following structural equation:

$$ChildH_{ij} = \alpha + \beta MLS_{ij} + \gamma X_{ij} + \varepsilon_{ij} \quad (1)$$

where $ChildH_{ij}$ represents the health outcomes of interest of child i of mother j, i.e., stunting, wasting, underweight and overweight. MLS_{ij} is a binary indicator of maternal labor supply for every child and X_{ij} is a vector of social, economic, and demographic characteristics of the child, mother and his/her family. ε_{ij} is the error term of the equation. Notice that parameter β in equation (1) is the parameter of interest or the effect of mother's employment on child malnutrition. Estimating this model using OLS or binary response models will yield inconsistent and biased estimates, capturing only a correlation between child health and maternal employment. The presence of omitted variables and simultaneity issues makes MLS an endogenous regressor. In other words, due to these two econometric challenges, the error term and the MLS covariate are correlated (i.e., $cov(MLS, \varepsilon) \neq 0$), producing thus inconsistent OLS estimates.

One strategy to address this problem and therefore to obtain consistent and unbiased estimates of β is estimating this parameter under the instrumental variables (IV) framework (Wooldridge, 2003). This is, introducing an exogenous covariate or instrument Z which partially determines maternal labor status but at the same time it is not correlated with the error term (ε) of equation (1). In particular, a two stage least square (2SLS) model will be used. The first stage estimates the endogenous variable MLS on the instrument Z and all the remaining exogenous covariates of the structural equation (1).

$$MLS_{ij} = \alpha_1 + \beta_1 Z_{ij} + \gamma_1 X_{ij} + \mu_{ij} \quad (2)$$

The instrument Z is valid as far as it holds two main assumptions. The first is the relevance condition which stablishes the correlation between the MLS and Z is different from zero, $cov(Z, MLS) \neq 0$. The second stablishes that the instrument and the error term in equation (1) are uncorrelated, $cov(Z, \varepsilon) = 0$. If these assumptions are met, it can be said that the instrument Z is "exogenous" in equation (1). The second stage is the OLS regression of equation (1), but instead of using MLS as itself, we include its prediction ($\widehat{MLS}$) from the first stage estimation. Thus, the second stage equation is the following:

$$ChildH_{ij} = \alpha + \beta_{IV} \widehat{MLS}_{ij} + \gamma X_{ij} + \omega_{ij} \quad (3)$$

In this case, if the assumptions related to the instrument described before hold, parameter β_{IV} is consistent and unbiased and becomes the causal effect of the maternal labor supply on child malnutrition outcomes (i.e., stunting, wasting, underweight, and overweight). Since the endogenous MLS covariate is instrumented with one instrument only, the model in equation (1) is exactly identified. Hence, the parameter β_{IV} is equivalent to the ratio of the parameter associated to Z of the "reduced form" equation, i.e., the regression of the outcome against the instrument and the X covariates (equation 4) and the parameter β_1 of the first stage ($\beta_{IV} = \beta_{RF}/\beta_1$).

$$ChildH_{ij} = \alpha_{RF} + \beta_{RF} Z_{ij} + \gamma_{RF} X_{ij} + \vartheta_{ij} \quad (4)$$

The outcome variables analyzed in this study are all dichotomous, taking the value of one if the child experienced stunting, wasting, underweight or overweight and zero otherwise. In this context, it is important to give special attention to the 2SLS strategy when using this kind of variables, since 2SLS relies on the assumption that the dependent variable in the second stage is continuous. In this sense, the estimates from linear models when the dependent variable is binary would be inadequate if the sample size is small and the dependent variable is skewed (Cleary & Angel, 1984). However, in this study the sample size is moderately large, and the mean of the outcome variables are not too skewed. Furthermore, Angrist (2001) suggests that the estimation of causal effects using IV, generate similar average effects whether the model is linear or not. On top of this, another concern would be the binary nature of the key endogenous variable (maternal employment). Hence, the first stage will perform a regression where the dependent variable is dichotomous. Nevertheless, Angrist (2001) argues that conventional 2SLS estimates using a linear probability model are consistent whether or not the first stage is linear. Thus, there is no concern to use a first stage linear model in this case.

Despite the fact that I use linear models in order to determine the causal effect of maternal labor status on child malnutrition, I alternatively run the seemingly unrelated regression (SUR) bivariate probit model (Greene 2018; Christofides et al., 1997). This model considers the first equation as the structural one where the nutritional outcomes are regressed on maternal labor supply and all other covariates. The second equation is the first stage specification of the IV – 2SLS where the maternal labor supply is regressed on the instrument and all other covariates. In this case, both equations are estimated together based on a binary choice probit model, allowing the errors of both equations to be correlated (i.e., $E(\varepsilon) = E(\mu) = 0, var(\varepsilon) = var(\mu) = 1, cov(\varepsilon, \mu) = \rho$). Note that, when ρ is equal to zero, then the parameter associated to MLS estimated with a probit model may be inconsistently estimated. In contrast, if ρ is statistically different from zero, indicating the existence of unobservable factors related to both maternal employment and children malnutrition, then the bivariate probit will provide consistent and unbiased estimates of the effect of maternal labor supply.

3.3.Maternal employment endogeneity

Maternal labor supply is endogenous when analyzing its association with child heath in equation (1). As mentioned before, this is due to two main issues. The first one has to do with the presence of unobserved characteristics that are correlated with the maternal labor supply and the child health outcomes. Note for example, maternal motivation and ability as unobserved characteristics because working woman might have less interest (motivation) or skills (ability) in taking care and raising of their kids, keeping all other constant (Anderson et al., 2003; Bishop, 2011). Similarly, Morrill (2011) argues that unobserved characteristics related to mother's preferences and skills might influence the choice of whether to work or not. For instance, if a mother's decision towards the labor market has to do with her general ability, motivation, or skills at caretaking, then the sample of working mothers will lead to a bias due to selection in the mother's sample.

More interestingly, Cavapozzi et al. (2021) argue that unobserved cultural norms may affect female labor market behavior through two channels, the first is information or social learning and the second is social pressure or conformity. In particular, gender norms may shape the labor market behavior of mothers with young children. For example, a mother decision to work can be determined by the gender role in her household. A woman whose peers present a gender-egalitarian behavior is more likely to work compared to a woman with more traditional peers.

Further unobserved characteristics that might be correlated with maternal employment are related to parental inputs such as the decision to continue a pregnancy (wantedness), the taste for risky behaviors and the maternal health endowment (Reichman et al., 2009). Again, not accounting for these factors in the structural equation of the infant health production function may lead to biased estimates associated to paternal inputs. For instance, Reichman et al., (2009) in terms of wantedness argue that pregnant women who take care of themselves promptly because they want to continue with their pregnancy would be more susceptible to eat more nutritiously, avoid large amounts of stress and potentially harmful substances, and engage in the appropriate exercise. Therefore, the child's nutrition will be better off due to the mother's wantedness. In contrast, the taste for risky prenatal behavior (i.e., cigarette smoking, alcohol consumption, and illicit drug use) leads to inadequate parental care and consequently a detrimental child health status. Finally, maternal health endowment previous and during the pregnancy may clearly impact child nutritional status. That is, mothers who suffer from cardiac disease, hypertension, chronic diabetes and other health conditions may affect the mother's expected birth outcomes and hence future children's nutrition.

The second issue is related to the reverse causality of the relationship between mother's employment and child health. This is the case when the mother chooses whether to work or not based on her child health status, or decide to quit her job to care her child who suffer detrimental health conditions, inducing a negative correlation between employment and child health through reverse causality (Bishop, 2011). Furthermore, several studies have analyzed the effect of child's health on mother's labor supply (Kuhlthau & Perrin, 2001; Mork et al., 2014; Tambi & Nkwelle, 2013), suggesting how child health status influence parental working decisions.

3.4. The instrument

As is standard in the literature, the variable to instrument mother's employment is the average working status among women measured at the regional or cantonal level. This exogenous instrument is motivated by the fact that it captures local labor market conditions and the demand of labor for women. The intuition behind this instrument is that higher average employment rates in a particular area makes it easier for resident mothers to find a work. On the contrary, higher rates of unemployment in a cluster is a barrier to find a job. This variable represents an external factor to mothers and households, and it is determined exogenously by the local economic conditions (Rashad & Sharaf, 2019).

Note that solely self-employed women working outside the home has been included in the definition of maternal employment, to avoid earning income and devoting time to childcaring at the same time. Thus, I am avoiding an in-built association. Additionally, the population of reference to calculate the instrument is all working age women (15+), including women economically active (employed and unemployed) and inactive. It is assumed that the possibility offered by the local labor market to find a job affects not only the mothers who are already employed but also those who are looking for a job and those who have decided to study or stay at home looking forward new opportunities to enter into the economically active population. Previous literature has used this instrument to avoid endogeneity problems in the attempt to find causal relationships between mother's labor supply and child health status (Anderson et al., 2003; Datar et al., 2014; Greve, 2011; Rashad & Sharaf, 2019). Based on the Demographic and Health Survey used in this study, the instrument is defined at the canton level. Thus, 206 cantons of the country are considered to compute the instrument of local labor market conditions.

In this context, female local employment rate should be a good instrument once controlled for mother's income and education since there exists variation in labor demand conditions and this variation is positively correlated with the maternal labor supply in my sample. In addition, to assure exogeneity of the instrument in the structural equation, I include other cantonal-level defined covariates[3] in the second stage (equation 1) which should be correlated to child health conditions such as poverty, and inequality measured as the Gini index. Thus, I address potential heterogeneity over cantons that might confound the IV estimates. Therefore, the instrument should be correlated to mother's working behavior, but it will not be able to affect directly the probability of a children to be malnourished, holding the relevance condition and the exclusion restriction.

4. Data and variables

To analyze the impact of maternal employment on children's nutrition, I use the *Encuesta Nacional de Salud y Nutricion* (ENSANUT) 2018 for Ecuador, which is part of the Demographic and Health Survey (DHS) program and produced by the National Institute of Statistics and Censuses (INEC). This is a cross-section survey that started in 2012,[4] and is intended to generate indicators regarding the main health situation of the Ecuadorian population in order to provide appropriate evidence for health and nutritional public policy (INEC, 2019a). The data requirements are extensive, providing rich information related to anthropometrics, children and women's health information, parent's socioeconomic variables and other household information.

The sample design implemented in ENSANUT 2018 is a two-stages probabilistic stratified sample. The first stage stratifies the sample by means of primary sampling units (PSU), while the second stage considers randomly a certain number of dwellings (in average, 18 dwellings) per PSU (INEC, 2019c). Thus, the survey investigated a total of 2.591 clusters and 43,311 dwellings, hence, the total sample size was 168,747 individuals (INEC, 2019b). The ENSANUT 2018 includes canton of residence identifiers. This allows to estimate more precisely the regional labor market condition. Finally, the sample used in this study considers 17,587 mothers and 20,204 U5 years old children.

4.1.Child nutritional outcomes and controls

Anthropometric indicators might be a good measure to understand child health status since they can be used to assess compromised health or nutrition well-being (O'Donnell et al., 2007). This information can shed light on assessing interventions responses on children who present nutritional deficits. In this context, to proxy child nutritional and health status, I use anthropometric measures available in a particular section in the ENSANUT 2018. The importance of using anthropometric measures lays on the assessment of children's physical status since these measures are good predictors of adequacy of diet and growth in infancy. Further, the interpretation of anthropometric indicators on an entire population is a relevant concern for public health purposes. Thus, these instruments may allow policy makers to follow and improve nutritional status of the population of interest (World Health Organization, 1995).

Anthropometric measurements include sex and age in days of children U5 years old as well as their weight in kilograms (kg) and height/length in centimeters (cm). Using this information and

[3] Cantonal-level covariates included in equation 2 has been compared to cantonal-level covariates estimated from the Labor Force Survey (*Encuesta Nacional de Empleo, Desempleo y Subempleo*, ENEMDU 2018) to assure the consistency of these covariates, this comparation is depicted in Figure A2 in the appendix.
[4] There are some methodological and content differences with respect to the version of 2018. In particular, differences regarding the sample size and survey questionnaire (INEC, 2019a).

the child growth standards developed by the WHO (de Onis et al., 2006), anthropometric indicators are estimated. The most common and used index in the literature is the standard deviation (SD) score (Z-score), which is calculated as the difference between the anthropometric value (weight, height/length) for a child and the median value of the reference population (WHO child growth standards) for the same sex and age, divided by the SD of the reference population (O'Donnell et al., 2007; World Health Organization, 1995). Therefore, I use three Z-scores (continuous variables and normally distributed) in order to define the anthropometric indicators, height-for-age Z-score[5] (HAZ), weight-for-age Z-score (WAZ) and weight-for -height Z-score (WHZ).

In this context and according to the World Health Organisation (2006), I consider a wasted child for extreme cases of low weight/height for age. In this case, the WHZ should be lower than -2 SD in the distribution. Furthermore, when the HAZ is lower than -2 SD, I consider the child as stunted. Underweighted child is considered as a severe deficit of weight for age (WAZ lower than -2 SD), while overweight child is considered if his WAZ is larger than +2 SD. This study follows the World Health Organization (WHO) recommendations of dropping the values out of the range of plausible Z-scores[6] (World Health Organisation, 2006).

Length, height and weight values of individuals were measured following a particular procedure (INEC, 2018). Each individual was measured using a weight scale and stadiometer two times, restarting the medical devise every time.[7] A third measure was taken when the difference between the two first measurements was larger than ±0.5 kg/cm. For the purposes of this study the final value of length, height and weight is computed as the average of the two first measurements if the differences between them are smaller than ±0.5 kg/cm. In contrast, if the difference between them is larger, the third anthropometric measurement is considered, and the final value will be the average between the two closest measures. The aim of following this strategy is to minimize any possible measurement error due to the specific measurement procedure applied during the interview.

4.2. Data variables

Firstly, the key independent variable of this analysis is maternal employment which is a dichotomous variable that equals 1 for wage earners mothers and self-employed mothers working outside the household; and 0 otherwise. As in this survey, maternal employment is measured contemporaneously, the estimated effects are limited by the influence of current household conditions on health nutritional outcomes. In addition, I use a large set of controls in order to explain the variability of the nutritional outcomes of children. All of them are taken from the ENSANUT 2018 from different sections of the survey. These covariates are defined as characteristics of the children, their mothers, and the environment where they live (household and family).

As children's characteristics I include the sex of child, his/her age in months as well as the squared age since the relationship of child age and the dependent variable is non-linear. In fact, age square allows to model the effect considering differentiation in ages than assuming that the effect is linear

[5] $HAZ = \frac{H_i - H_m}{SD_H}$, where H_i represents the height of the child, H_m is the median height of the reference population for the same sex and age and SD_H is the standard deviation of the height in the reference population. All other Z-scores follow the same criterion.

[6] The recommendation for implausibility data based on the (World Health Organisation, 2006) standard is the following: data is excluded if a child's HAZ is below –6 SD or above +6 SD, WAZ is below –6 SD or above +5 SD, WHZ is below –5 SD or above +5 SD.

[7] In the case of children younger than 2 years old, they were measured in the supine position using a specific stadiometer.

for all ages. Moreover, I use the early initiation of breastfeeding which is a dichotomous variable that equals 1 if the child was born in the last 12 months and was put to the breast within one hour of birth since the first milk produced in the first days, also called colostrum, is an important source of nutrition and immune protection for the newborn (World Health Organization, 2010). Regarding the mother's characteristics, I introduce their age as well as the age square based on the same rationality of child age. Further, I include the height of the mother in order to control somehow the possible genetic heritage. In what respect to the social and demographic features of the mother I use their educational attainment level, their marital status, and their ethnicity. The latter plays an important role in childhood nutrition since different ethnic groups in Ecuador may have diverse food intake culture and traditions.

The environmental characteristics of children also matter when analyzing their health status. In this sense, I consider the familiar income level divided by quintiles, this is one of the most relevant determinants of nutritional status of children according to the health production function framework discussed in section 2. In addition to this, paternal employment, number of U5 years old children and area of residence (urban/rural) are accounted for. It is important to control for the number of women[8] living in the household because they can be a substitute of childcaring when mothers work out home. Finally, I include dwelling features such as overcrowding, not appropriate excreta disposal and not safe water to drink that might be relevant in the nutrition of children. Table A1 shows a description for the key variables used in this study, while Tables A2 and A3 depicted in the appendix show the descriptive statistics of these variables.[9]

5. Empirical results

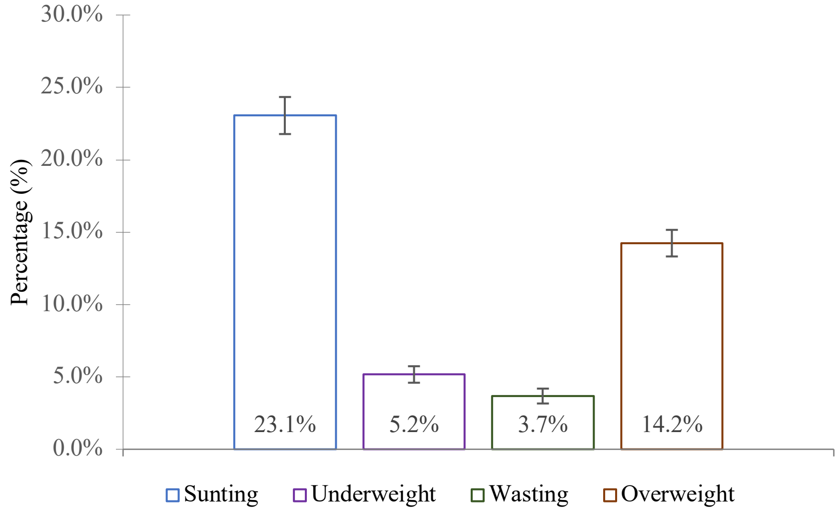
5.1. Descriptive statistics

According to the data, long-term and chronic malnutrition in Ecuador is reveled to be a public health challenge of first order in comparison to short-term malnutrition. For instance, the prevalence of stunting among U5 years old children living together with their mothers is as high as 23.1%, while a much-reduced prevalence of 3.7% and 5.2% is for wasting and underweight, respectively. Furthermore, the percentage of children overweighted rises to 14.2%, which is not trivial, and it is also becoming an important health issue in the country (see Figure 1). In the region (South America), Ecuador presents the highest percentage of stunting according to UNICEF. Neighboring countries present a much better nutritional condition, for instance, in 2015-2016 Colombia reached a 12.7% stunting rate. More recently, by 2019, Peru presented a 12.2% of stunting (UNICEF et al., 2021).

The socio-economic characterization of these malnourished children is shown in Table 1. Note that boys have poorer nutritional outcomes than girls, except for overweight where the percentage of children with this status is almost the same. Further analysis suggests that stunting seems to be larger for low educated mothers, but interestingly, the share of children with overweight is much larger for mothers with high education than with low or intermediate education. As expected, it is noteworthy to verify that the share of stunted children living in poor households is higher than the one in richer households. A significant difference of 16.3 percentage points in the prevalence of stunting is found between the lowest and the highest family income quintile. The phenomenon is the same for the underweighted children. In contrast, the percentage of overweight children is lightly higher in the richest households compared to children living in the poorest households.

[8] Women between 15 to 65 years old living in the same household of the children.
[9] Note that survey weights are utilized for all mean calculations and the standard errors are corrected for the clustering effect.

Figure 1. Nutritional and health outcomes for children under five



Source: ENSANUT 2018. Notes: Figures presented here are estimated considering the sample of children living with their mothers only and survey weights.

Table 1. Child malnutrition by socio-economic characteristics

Variable	Stunting	Underweight	Wasting	Overweight
Child's sex				
Male	24.8%	6.0%	4.2%	14.2%
Female	21.2%	4.3%	3.1%	14.3%
Mothers' education				
No education/Primary	29.0%	6.4%	3.1%	13.3%
Secondary	22.7%	5.3%	4.1%	13.5%
Tertiary	17.1%	3.6%	3.1%	17.1%
Family income quintile				
Lowest	32.3%	7.1%	3.6%	15.2%
Second	23.9%	5.7%	3.7%	12.7%
Middle	22.6%	5.7%	3.5%	13.9%
Fourth	20.2%	5.1%	4.9%	13.6%
Highest	16.1%	2.2%	2.6%	15.7%

Source: ENSANUT 2018

High levels of stunting are located mostly in the Amazon region and in the center highlands of the country. Nevertheless, the province reporting the highest percentage of stunting belong to the coastal region. Moreover, the south of the country is more affected by the prevalence of overweight, while the highest prevalence of wasting and underweight is mostly located in one particular province in the coast region (Esmeraldas) and in the Amazon as well (see Figure A1 in the appendix).

Table 2 shows differences in the structure of the maternal labor activity condition over relevant socio-economic background. It is noteworthy that in Ecuador the economically inactive group of mothers, regardless the residence area, are larger than the economically active mothers' group (employed and unemployed). Interestingly, the presence of inactive mothers within the non or primary education group is much higher, whereas mothers with tertiary education are more involved in the labor force. For instance, the 64.3% of the total working age mothers are employed whereas the 5.2% are unemployed.

In addition, Table 2 reveals that the share of employed (unemployed) mothers raises (falls) with the level of their family income. This is obvious since mothers who work earn more money for their households. Finally, single mothers are more likely to be unemployed with respect to the other mothers with different marital status. In contrast, divorced mothers present a higher propensity to be employed. Married or mother in union are more involved in the inactivity.

Table 2. Maternal activity condition by socio-economic characteristics

Variable	Employed	Unemployed	Inactive
Region of residence			
Urban	41.5%	3.4%	55.1%
Rural	44.6%	5.3%	50.2%
Mothers' education			
No education/Primary	38.6%	2.8%	58.6%
Secondary	37.5%	5.3%	57.2%
Tertiary	64.3%	5.2%	30.5%
Household income quintile			
Lowest	34.3%	7.5%	58.3%
Second	26.9%	5.6%	67.5%
Middle	30.8%	4.6%	64.6%
Fourth	50.5%	3.8%	45.7%
Highest	75.3%	2.0%	22.7%
Mothers' marital status			
Married or union	40.8%	3.2%	55.9%
Divorced	56.6%	8.7%	34.7%
Single	52.2%	12.0%	35.7%

Source: ENSANUT 2018

This descriptive evidence points towards the existence of a high share of stunted children concentrated among socio-economic vulnerable households, particularly those with low education skills and poor mothers. On the contrary, overweight children are more likely to live in households with high skilled and rich mothers. There is not much variation of wasted and underweighted children over the socio-economic background. Overall, most mothers are out of the labor market or inactive, especially those married or in union with low education and with medium family income. In contrast, high educated mothers with the highest family income are more involved in the labor force as employed mothers.

5.2. OLS estimates

The first step to empirically analyze the relationship between maternal labor supply and nutritional status of children is to run an ordinary OLS model estimation. Therefore, I estimate a linear probability model where not only stunting but also underweight, wasting and overweight are the outcomes of interest. The OLS results are presented in Table 3.

The baseline model takes into account up to four specifications with a wide set of observed characteristics. Note for instance in column (1) of Table 3, when controlling for child's characteristics only, the coefficient associated to maternal employment is not significant. However, when I control for mother's characteristics, the coefficient of maternal employment becomes positive and significant at 5% level. This coefficient increases slightly, and it remains significant when household environment controls are accounted for. This implies that controlling for maternal education, anthropometrics, household composition, family income and other factors, children of working mothers increases on average the likelihood of being stunted by 1.6 pp with respect to children whose mothers do not work (they can be unemployed or economically inactive). Finally, when the ethnic group of the mother is included as a control (preferred specification), the maternal employment coefficient falls and becomes statistically negligible.

In respect to the coefficients associated to the covariates (see Table 3), most of them are highly significant with the expected sign. For example, mothers with secondary and tertiary education are less likely to have stunted children compared with mothers with non- or primary education. Similarly, children living in richer households have lower chances to be stunted in comparison to those living in poorer households. Interestingly, the higher is the number of U5 children residing in the household, the higher is the probability that a child can be stunted. Moreover, the taller the mother (a sign of past health status and prosperity), the lower the probability of having stunted children. Column (4) of Table 3 shows that mothers belonging to the ethnic group of indigenous, increases the probability of having stunted children compared to mothers with mestizo's cultural trace. The coefficients associated to each control do not change dramatically over specifications.

Column (5) of Table 3 reports a negative and significant at 10% coefficient of maternal employment for underweight children, considering children's characteristics only. This suggests that maternal employment is negatively related with having an underweight child. In contrast, the coefficient of maternal employment associated to overweight for the same specification is positive at 5% level of significance (see column (13) of Table 3). In this case, maternal employment increases the likelihood by 1 pp that a child suffers from overweight. However, after adding more controls, the maternal employment estimate becomes not significant at any conventional level of statistical significance. The results for being underweight and wasting are in the same direction. The latter is not significant in any specification.

As discussed above, the estimates of maternal employment on all children nutritional outcomes based on an OLS framework can be problematic since the mother's choice to work could be driven by unobserved characteristics that are also correlated to children's likelihood to be stunted, underweighted, wasted or overweighted. Therefore, it is important to test whether the relationship of maternal employment and nutritional outcomes are exogenous. Thus, next subsection addresses this particular issue considering the Durbin–Wu–Hausman testing approach.

Table 3. OLS baseline model of the impact of mother's employment on child nutritional status

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	Stunting				**Underweight**				**Wasting**				**Overweight**			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Maternal employment	-0.001	0.015**	0.016**	0.006	-0.006*	-0.003	-0.001	-0.001	0.000	0.001	0.001	0.002	0.010**	0.008	0.004	0.001
	(0.007)	(0.007)	(0.007)	(0.007)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.006)	(0.006)	(0.006)
Child's sex (male)	0.042***	0.043***	0.042***	0.042***	0.013***	0.013***	0.012***	0.012***	0.007**	0.006**	0.006**	0.006**	0.017***	0.017***	0.018***	0.017***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)
Child's age in months	0.002*	0.002*	0.002**	0.002*	-0.001	-0.001	-0.001	-0.001	-0.003***	-0.002***	-0.002***	-0.002***	-0.006***	-0.006***	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Child's age in months square	-0.000***	-0.000***	-0.000***	-0.000***	0.000	0.000	0.000	0.000	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Early initiation breastfeeding	-0.053***	-0.062***	-0.067***	-0.070***	0.006	0.006	0.005	0.005	0.002	0.006	0.006	0.007	0.000	-0.001	0.002	0.001
	(0.014)	(0.014)	(0.014)	(0.014)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.012)	(0.012)	(0.012)	(0.012)
Mother's age		-0.005	-0.006	-0.005		-0.002	-0.002	-0.002		-0.001	-0.002	-0.002		-0.002	0.001	0.001
		(0.003)	(0.004)	(0.004)		(0.002)	(0.002)	(0.002)		(0.001)	(0.002)	(0.002)		(0.003)	(0.003)	(0.003)
Mother's age square		0.000	0.000	0.000		0.000	0.000	0.000		0.000	0.000	0.000		0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Mother's height		-0.010***	-0.009***	-0.009***		-0.002***	-0.002***	-0.002***		0.000**	0.001**	0.000**		0.002***	0.002***	0.002***
		(0.001)	(0.001)	(0.001)		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)
Education (non- or primary education)																
Secondary education		-0.062***	-0.034***	-0.034***		-0.012***	-0.007	-0.006		0.001	0.002	0.002		0.002	0.001	0.001
		(0.009)	(0.009)	(0.009)		(0.004)	(0.005)	(0.005)		(0.003)	(0.004)	(0.004)		(0.007)	(0.007)	(0.007)
Secondary education		-0.102***	-0.054***	-0.052***		-0.024***	-0.010*	-0.010*		-0.001	0.005	0.005		0.018**	0.009	0.009
		(0.010)	(0.011)	(0.011)		(0.005)	(0.006)	(0.006)		(0.004)	(0.005)	(0.005)		(0.008)	(0.010)	(0.010)
Marital status (married or in union)																
Divorced		-0.027**	-0.017	-0.013		0.006	0.005	0.005		-0.006	0.001	0.001		-0.009	0.007	0.008
		(0.011)	(0.015)	(0.015)		(0.006)	(0.009)	(0.009)		(0.004)	(0.007)	(0.007)		(0.009)	(0.012)	(0.012)
Single		0.010	0.022	0.024		0.012**	0.013	0.013		-0.001	0.006	0.006		0.012	0.023*	0.025*
		(0.011)	(0.015)	(0.015)		(0.006)	(0.008)	(0.008)		(0.005)	(0.007)	(0.007)		(0.009)	(0.013)	(0.013)
Paternal employment			0.008	0.006			-0.000	-0.000			0.010*	0.010*			0.018*	0.017*
			(0.012)	(0.012)			(0.007)	(0.007)			(0.005)	(0.005)			(0.010)	(0.010)
Children in the household			0.036***	0.032***			0.006	0.006			-0.006*	-0.005*			0.005	0.003
			(0.007)	(0.007)			(0.004)	(0.004)			(0.003)	(0.003)			(0.006)	(0.006)
Women in the household			-0.003	-0.003			-0.001	-0.001			0.001	0.001			0.007*	0.007*
			(0.005)	(0.005)			(0.002)	(0.002)			(0.002)	(0.002)			(0.004)	(0.004)

Area of residence (urban)			-0.033***	-0.022***			-0.001	-0.001			-0.002	-0.004			-0.007	-0.004
			(0.008)	(0.008)			(0.004)	(0.004)			(0.003)	(0.003)			(0.007)	(0.007)
Overcrowding			0.014*	0.014*			0.004	0.004			-0.001	-0.001			-0.008	-0.008
			(0.008)	(0.008)			(0.004)	(0.004)			(0.004)	(0.004)			(0.007)	(0.007)
Not appropriate excreta disposal			0.032***	0.028***			0.016***	0.015***			0.002	0.003			-0.007	-0.009
			(0.008)	(0.008)			(0.004)	(0.004)			(0.003)	(0.003)			(0.007)	(0.007)
Safe water to drink			0.001	0.003			-0.001	-0.001			-0.000	-0.000			-0.008	-0.008
			(0.007)	(0.007)			(0.004)	(0.004)			(0.003)	(0.003)			(0.006)	(0.006)
Family income quintile (poorest)																
Second			-0.051***	-0.042***			-0.013**	-0.013**			-0.006	-0.007			0.000	0.002
			(0.010)	(0.010)			(0.006)	(0.006)			(0.004)	(0.004)			(0.008)	(0.009)
Middle			-0.053***	-0.044***			-0.008	-0.007			-0.006	-0.006			-0.006	-0.004
			(0.011)	(0.011)			(0.006)	(0.006)			(0.005)	(0.005)			(0.009)	(0.009)
Fourth			-0.054***	-0.046***			-0.009	-0.008			-0.006	-0.007			-0.001	0.001
			(0.011)	(0.011)			(0.006)	(0.006)			(0.005)	(0.005)			(0.009)	(0.009)
Highest			-0.050***	-0.041***			-0.021***	-0.020***			-0.013**	-0.013***			0.016	0.018*
			(0.012)	(0.012)			(0.006)	(0.006)			(0.005)	(0.005)			(0.011)	(0.011)
Ethnicity (mestizo)																
Indigenous				0.068***				0.002				-0.005				0.020**
				(0.012)				(0.006)				(0.004)				(0.010)
Black				-0.036**				0.017*				0.009				-0.029**
				(0.015)				(0.010)				(0.008)				(0.013)
Montubio				-0.035**				-0.001				-0.005				-0.006
				(0.016)				(0.008)				(0.007)				(0.013)
White				-0.023				0.013				0.005				0.013
				(0.028)				(0.015)				(0.014)				(0.028)
Constant	0.253***	1.898***	1.768***	1.664***	0.057***	0.367***	0.341***	0.348***	0.075***	0.013	0.005	0.016	0.229***	-0.039	-0.077	-0.114
	(0.015)	(0.100)	(0.105)	(0.105)	(0.008)	(0.048)	(0.053)	(0.055)	(0.008)	(0.039)	(0.042)	(0.042)	(0.013)	(0.081)	(0.086)	(0.087)
Observations	18,902	18,369	18,060	18,060	18,947	18,410	18,099	18,099	18,268	17,747	17,450	17,450	18,891	18,355	18,046	18,046
R-squared adjusted	0.0102	0.0454	0.0554	0.0585	0.00163	0.00667	0.00914	0.00920	0.00748	0.00707	0.00743	0.00743	0.0103	0.0122	0.0126	0.0130

Notes: Standard errors in parentheses clustered by primary sampling units[10], *** p<0.01, ** p<0.05, * p<0.1

[10] Since the survey presents a complex sampling design, the standard errors should consider the stratification and the sample selection stages. In this context, in all specifications presented in this study, the standard errors are clustered by the PSU since the sample is subdivided into smaller-sized groups (PSU). This avoids possible inconsistent estimates of the standard errors because of correlations within groups. In other words, this procedure addresses the heteroskedasticity problem providing right estimates of standard errors of each specification (Cameron et al, 2015).

5.3. *Testing for maternal labor supply exogeneity*

The Durbin–Wu–Hausman (DWH) test evaluates the consistency of the maternal employment estimator when compared to an alternative model, which is consistently estimated. In this case, I use the IV model as the alternative one to identify whether the regressor associated to maternal employment is exogenous or not. The results suggest that maternal employment in the OLS framework for children being stunted is endogenous since the DWH test rejects the null hypothesis of exogeneity (F-statistic = 43.9461, p-value = 0.0000). Thus, the estimates of maternal labor supply presented in Table 3 regarding the stunting model are inconsistent and biased. Hence in this case, IV strategy will be a better approach to find causal effects of the association between maternal employment and stunted children.

On the other hand, the exogeneity tests for the regressor of maternal employment for underweight, wasting and overweight models do not reject the null hypothesis of maternal employment exogeneity (F-statistic = 0.4406, p-value = 0.5068; F-statistic = 0.0453, p-value = 0.8315; F-statistic = 0.4442, p-value = 0.5051; respectively). These results indicate that OLS will provide consistent estimates of maternal employment on all nutritional outcomes except for stunting. Notwithstanding of the DWH test results, the related literature strongly suggests the presence of unobserved characteristics correlated to maternal decision on whether to work or not when they have under five years old children with malnutrition problems. Then, next section will address the estimates of the causal effect of maternal labor supply on the children's nutrition based on the IV framework.

5.4. *Instrumental Variable estimates*

In order to account for the endogeneity of maternal labor supply when analyzing its impact on children's nutritional status, I consider the IV – 2SLS approach discussed in section 3. The first stage regression (shown in Table A4 in the appendix), regresses maternal employment on the instrument (local labor market employment) and all the remaining exogenous covariates. The findings indicate that the instrument is strongly correlated with maternal employment. Note that this reduced form equation includes two cantonal-level variables (poverty and inequality) to ensure the exogeneity of the instrument and thus satisfy the validity condition. Furthermore, at the bottom of Table 4 it is reported the p-value of the test of weak instruments: in all cases the null hypothesis of weak instrument is rejected. Therefore, the relevance condition is satisfied.

The IV – 2SLS estimates shows a large raise of the impact of maternal employment on children's stunting, becoming the coefficient highly significant. According to column (1) in Table 4 when controlling for observed (preferred specification), unobserved characteristics and reverse causality, maternal employment increases the probability of having a stunted child by roughly 25 pp with respect to unemployed and inactive mothers. In contrast, the effect of maternal employment on underweighted, wasted, and overweighted children is not significant at any conventional level of significance. This suggests that maternal employment in Ecuador might not have any impact on these nutritional and health outcomes. On the other hand, it seems that the OLS model may underestimate the effect of maternal labor supply on stunted children in a large extent.

Focusing on the IV – 2SLS baseline model of the impact of mother's employment on child stunting status, boys present poorer nutritional conditions rather than girls. All other coefficients associated to the main covariates have the expected sign and are significant. In this sense, children who live with low educated and poor mothers are more likely to be stunted, compared to high educated and richer mothers. Anthropometric characteristics also play an important role in predicting child stunting, i.e., the shorter the mother, the higher the probability of having a stunted child. In addition, this empirical evidence suggests that early initiation of breastfeeding decreases the probability to being stunting.

Table 4. IV – 2SLS baseline model of the impact of mother's employment on child nutritional status

Variables	(1) **Stunting**	(2) **Underweight**	(3) **Wasting**	(4) **Overweight**
	Model 5	Model 5	Model 5	Model 5
Maternal employment	0.254***	0.012	-0.002	0.022
	(0.043)	(0.022)	(0.017)	(0.034)
Child's sex (male)	0.041***	0.012***	0.006**	0.017***
	(0.006)	(0.003)	(0.003)	(0.005)
Child's age in months	0.001	-0.001	-0.002***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Child's age in months square	-0.000***	0.000	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Early initiation breastfeeding	-0.071***	0.005	0.007	0.001
	(0.014)	(0.007)	(0.007)	(0.012)
Mother's age	-0.017***	-0.002	-0.001	-0.000
	(0.004)	(0.002)	(0.002)	(0.004)
Mother's age square	0.000***	0.000	0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Mother's height	-0.008***	-0.002***	0.000**	0.002***
	(0.001)	(0.000)	(0.000)	(0.000)
Education (non- or primary education)				
Secondary education	-0.032***	-0.006	0.002	0.001
	(0.009)	(0.005)	(0.004)	(0.007)
Tertiary education	-0.073***	-0.011*	0.005	0.008
	(0.012)	(0.006)	(0.005)	(0.010)
Marital status (married or in union)				
Divorced	-0.060***	0.003	0.002	0.004
	(0.018)	(0.009)	(0.007)	(0.014)
Single	-0.018	0.011	0.006	0.021
	(0.017)	(0.009)	(0.008)	(0.014)
Paternal employment	0.025*	0.001	0.010*	0.019*
	(0.013)	(0.007)	(0.006)	(0.010)
Children in the household	0.034***	0.006	-0.005*	0.004
	(0.008)	(0.004)	(0.003)	(0.006)
Women in the household	0.001	-0.001	0.001	0.007*
	(0.005)	(0.002)	(0.002)	(0.004)
Area of residence (urban)	-0.006	0.002	-0.004	-0.004
	(0.009)	(0.004)	(0.003)	(0.007)
Overcrowding	0.009	0.003	-0.001	-0.008
	(0.009)	(0.004)	(0.004)	(0.007)
Not appropriate excreta disposal	0.027***	0.014***	0.003	-0.008
	(0.009)	(0.005)	(0.003)	(0.007)
Safe water to drink	0.006	-0.001	-0.000	-0.008

	(0.007)	(0.004)	(0.003)	(0.006)
Family income quintile (poorest)				
Second	-0.033***	-0.011*	-0.007*	0.000
	(0.011)	(0.006)	(0.004)	(0.009)
Middle	-0.049***	-0.005	-0.006	-0.007
	(0.011)	(0.006)	(0.005)	(0.009)
Fourth	-0.085***	-0.008	-0.007	-0.006
	(0.014)	(0.007)	(0.006)	(0.011)
Highest	-0.127***	-0.021**	-0.012	0.007
	(0.020)	(0.010)	(0.008)	(0.016)
Ethnicity (mestizo)				
Indigenous	0.007	-0.003	-0.004	0.019
	(0.016)	(0.007)	(0.005)	(0.012)
Black	-0.035**	0.016	0.010	-0.026**
	(0.015)	(0.010)	(0.008)	(0.013)
Montubio	-0.007	-0.001	-0.006	-0.003
	(0.017)	(0.008)	(0.007)	(0.014)
White	-0.020	0.013	0.005	0.013
	(0.030)	(0.015)	(0.013)	(0.028)
Cantonal-level poverty	0.038	0.033***	-0.002	-0.025
	(0.027)	(0.012)	(0.010)	(0.021)
Cantonal-level inequality	0.021	-0.017	-0.010	-0.035
	(0.049)	(0.024)	(0.019)	(0.040)
Constant	1.719***	0.340***	0.021	-0.074
	(0.115)	(0.055)	(0.043)	(0.089)
Observations	18,060	18,099	17,450	18,046
Test of weak instruments - p-value	0.000	0.000	0.000	0.000

Notes: Standard errors in parentheses clustered by primary sampling units; *** p<0.01, ** p<0.05, * p<0.1.

6. Robustness checks

Table 5 explores the robustness of the main findings from three different approaches. The first has to do with using a different sample criterion, while the second considers the same sample of the baseline scenario but instead to perform an IV – 2SLS, I perform a Seemingly Unrelated Regression (SUR) Bivariate Probit model. Finally, in the third check, I perform an IV – 2SLS on the outcomes of moderate and severe stunted children. Notice that all these estimates are based on the preferred specification.

In the first sensibility analysis, I restrict the sample to mothers involved in the labor force only (mothers economically active) comprising a much-reduced sample size. Therefore, the analysis now focuses on the trade-off between maternal employment and unemployment, in both cases mothers desire and are able to work.

In this sense, results reported in column (1) of Table 5 are similar to the OLS estimates based on the complete sample, which considers economically active and inactive mothers. Nonetheless, when the IV – 2SLS strategy is applied, the effect of maternal employment on stunting experiences a huge increase compared to the baseline estimates (column (2) of Table 5). Here, the interpretation may differ from the results presented in section 5 since, in this case, the base category of maternal employment is composed by all unemployed mothers only. Thus, when inactive mothers are accounted for, then children's health penalty paid by employed mothers is much reduced (the positive causal effect is lower) since these mothers have more time to care their children compared to just unemployed mothers who desire to be in the labor force.

In this context, the fact that a mother works, dramatically increases the probability of having a stunted child by 135.6 percentage points with respect to those mothers who are unemployed. This is interesting in itself since mothers in unemployment perhaps are looking for a job because they need more income to improve the health of their children. Overall, they are more socio-economic vulnerable mothers as described in the previous subsection (see Table 2). On the other hand, the coefficients of maternal employment based on the restricted sample associated to underweight, wasting and overweight are not significant neither for the OLS, nor for the IV – 2SLS regression models. This is roughly similar to the results obtained under the baseline scenario.

Table 5. Effect of maternal employment on children's nutritional outcomes

	(1)	(2)	(3)
Nutritional outcome	**Labor force sample**		**Working age sample**
	OLS	**IV - 2SLS**	**Bivariate Probit**
Stunting	0.028*	1.356***	0.215***
Underweight	0.007	0.115	-0.004
Wasting	0.005	-0.088	0.000
Overweight	0.006	0.025	0.022

Notes: Regressions run based on the preferred specification. Standard errors have been clustered by primary sampling units. The coefficient obtained from the SUR bivariate probit model has been computed as the average partial effect. *** p<0.01, ** p<0.05, * p<0.1.

The second robustness check considers the complete sample of working age mothers or baseline scenario. However, because the dependent variable is binary, I use a binary choice model with endogenous regressors. In particular, a SUR Bivariate Probit model is fitted, which is an extension of the Probit model that allows for two probit equations with correlated disturbance terms assumed to come from a joint or bivariate normal distribution (Greene, 2018). Column (3) of Table 5, therefore, reports the average effect of maternal employment on nutritional outcomes. In the case of stunting, as expected the coefficient is positive and highly significant suggesting that maternal employment raises the probability of having a stunted child by 21.5 pp, this coefficient (average partial effect) is similar to the impact found using the IV – 2SLS model. Furthermore, it is important to check whether the error terms of both probit equations are correlated. In this context, a Wald test of ρ (-0.4260) suggests that in the case of the stunting model the null hypothesis is rejected (chi2 = 44.7321, p-value = 0.0000), providing evidence that maternal employment is endogenous. In other words, there may be unobservable characteristics of individuals that adversely influence stunted children and employed mothers. Consequently, the SUR Bivariate Probit model is recommended in order to obtain consistent estimates of the structural equation parameters.

The average effects of maternal employment on underweighted, wasted and overweighted children are not significant neither consistent as expected since in these cases the null hypothesis of correlation between error terms cannot be rejected (p-value = 0.883; p-value = 0.898; p-value = 0.490 respectively). Hence, the SUR Bivariate Probit is not necessary. This conclusion is also achieved when analyzing the test of endogeneity of DWH in section 5.

6.1. Maternal labor supply impact on severe and moderate stunting

In this sub section, I present a robustness check that is an extension of the IV – 2SLS baseline model to analyze the causal effect of maternal employment on children who suffer from moderate and severe stunting[11]. Table 6 shows the results based on the preferred specification. We evidence that the coefficient of maternal employment is positive and significant at 1% and 5% level of significance respectively. Maternal employment leads to an increase in the probability of having a moderated stunted child by 19.1 pp compared with maternal unemployment and inactivity. In a lower extent, the probability to have a severe stunted child is 6.9 pp higher for working mothers than unemployed and inactive mothers. Overall, the effect of maternal employment on having a child with moderate stunting is much higher with respect to child with severe stunting in 12.2 points.

Further analysis suggests that the probability to be stunted increases more for boys rather than for girls, as was reported in the baseline model. Here, for both moderate and severe stunting, the coefficients associated to the sex of the child are very similar. In contrast, a raise in the number of U5 children living in the household, increases in a larger extent the likelihood of being moderated stunted compared to severe stunted.

Regarding the socio-economic characteristics of the mother, children to mothers with no education or primary education have a higher risk to be moderate or severe stunted, with respect to those who live with mothers with tertiary education attainment. Nevertheless, findings related to household income are very different. Note that mothers located in the poorest family income quintile present a higher probability to have a moderate stunted child in comparison to all richer quintiles, while there is no difference in the probability of having a severe stunted child between the poorest mothers with respect to higher income quintiles, except to the fourth quintile where the coefficient is significant at 10% level only.

Regarding marital status, married (or in union) mothers are more likely to have a moderate stunted child compared to divorced mothers. There is not statistically difference with respect to single mothers. In the case of severe stunted children, the coefficients associated to the marital status of the mother is negligible which means that there is no differences on the probability to have a severe stunted child for married or in union, divorced or single mothers. Interestingly, only severe stunted children whose mothers are indigenous increases the risk to suffer this problem with respect to the larger ethnic group, mestizos. On the other hand, being a black mother decreases the probability to have a severe stunted child with respect to mestizo's mothers.

Table 6. IV – 2SLS baseline model of the impact of mother's employment on stunting

Variables	(1) **Moderate**	(2) **Severe**
	Model 5	Model 5
Maternal employment	0.191***	0.069**
	(0.037)	(0.029)
Child's sex (male)	0.020***	0.021***
	(0.006)	(0.004)

[11] Moderate stunting: height/length for age z-score in the range of [-2 SD, -3 SD]. Severe stunting: height/length for age z-score in the range of (-2 SD, -6 SD]. Definitions taken from a consensus reached among experts in children health (World Health Organization, 1995).

Child's age in months	0.003***	-0.002***
	(0.001)	(0.001)
Child's age in months square	-0.000***	0.000
	(0.000)	(0.000)
Early initiation breastfeeding	-0.050***	-0.021**
	(0.011)	(0.010)
Mother's age	-0.012***	-0.006**
	(0.004)	(0.003)
Mother's age square	0.000**	0.000
	(0.000)	(0.000)
Mother's height	-0.007***	-0.001***
	(0.000)	(0.000)
Education (non- or primary education)		
Secondary education	-0.011	-0.020***
	(0.008)	(0.006)
Tertiary education	-0.035***	-0.037***
	(0.010)	(0.008)
Marital status (married or in union)		
Divorced	-0.060***	-0.002
	(0.015)	(0.011)
Single	-0.021	0.005
	(0.015)	(0.011)
Paternal employment	0.010	0.016**
	(0.011)	(0.008)
Children in the household	0.021***	0.013**
	(0.006)	(0.005)
Women in the household	0.002	-0.000
	(0.004)	(0.003)
Area of residence (urban)	-0.000	-0.006
	(0.007)	(0.005)
Overcrowding	0.002	0.009
	(0.007)	(0.006)
Not appropriate excreta disposal	0.016**	0.013**
	(0.007)	(0.006)
Safe water to drink	0.006	0.000
	(0.006)	(0.004)
Family income quintile (poorest)		
Second	-0.030***	-0.003
	(0.009)	(0.007)
Middle	-0.045***	-0.004
	(0.010)	(0.007)
Fourth	-0.069***	-0.015*
	(0.012)	(0.009)
Highest	-0.112***	-0.017
	(0.017)	(0.013)
Ethnicity (mestizo)		
Indigenous	-0.013	0.019*
	(0.014)	(0.011)
	-0.016	-0.020**

Black	(0.013)	(0.009)
Montubio	0.001	-0.011
	(0.014)	(0.011)
White	-0.004	-0.018
	(0.025)	(0.016)
Cantonal-level poverty	0.021	0.016
	(0.023)	(0.017)
Cantonal-level inequality	0.037	-0.018
	(0.040)	(0.032)
Constant	1.306***	0.425***
	(0.095)	(0.073)
Observations	18,061	18,061

Notes: Standard errors in parentheses clustered by primary sampling units; *** p<0.01, ** p<0.05, * p<0.1.

In all, I find strong evidence that maternal employment leads to an increase in the probability of having stunted children. I do not find significant evidence of causal effects of maternal employment on the probability of having underweighted, wasted, and overweighted children. In addition, the gap between the employed and unemployed mothers is huge in terms of the impact on children stunting status. Finally, maternal employment seems to have a larger impact in moderate stunted children rather than in severe stunted children.

7. Discussion and conclusions

This study sought to determine whether maternal employment influences malnutrition in Ecuadorian U5 years old children. Children's nutritional outcomes has been computed using anthropometric measurements that are well suited in this study due to their simplicity of the collection and interpretation. In this sense, anthropometric measurements play a crucial role for the purpose of program planning, implementation, and evaluation public health policies. The empirical evidence suggests that after accounting for maternal employment endogeneity, working mothers increase the probability to have stunted or chronic malnourished children by 25.4 pp with respect to unemployed and inactive mothers. This result suggests that the maternal time devoted to childcaring input and hence avoided is more important for children's health than the additional income that a working mother may obtain. Even though Ecuador has been classified as upper-middle income economy according to the World Bank (2020c), the impact of maternal employment on stunted children is slightly higher than those for low and lower-middle income countries. For instance, in Ethiopia unemployed mothers were 23 pp (p-value < 0.01) less likely to have a stunted child compared with employed mothers (Amaha & Woldeamanuel, 2021). Similarly, in Egypt the probability of being stunted is 18.6 pp (p-value < 0.05) higher for children whose mothers are employed (Rashad & Sharaf, 2019).

I did not find empirical evidence related to the impact of maternal employment on children suffering from wasting, underweight, and overweight. Even after controlling for endogeneity, the effects are negligible in both OLS and IV – 2SLS specifications. In contrast, when the effect of maternal employment is analyzed on children with stunting, I noticed that OLS specification underestimates the effect of interest. In this case, based on the Durbin–Wu–Hausman test, I argue that the IV – 2SLS strategy provides consistent estimates, while the OLS provides inconsistent and biased estimates. Further analysis suggests that the results are robust since the Seemingly Unrelated Regression Bivariate Probit supports my estimates for all children's nutritional outcomes.

When chronic malnutrition was disaggregated by severity, I also found that maternal employment was an equally remarkable determinant of a child's risk of experience both moderate and severe stunting once accounted for endogeneity. While a working mother increases the likelihood of having a moderate stunted child by 19.1 pp, the likelihood of having a severe stunted child raises by 6.9 pp. In addition, the probability to suffer malnourishment is associated to mothers with deficient socio-economic levels. Mothers located in the poorest family income quintile and with lower or non-education seems to increase the probability to have a child with malnourishment problems. Interestingly, boys present a higher risk of being malnourished than girls. This provides evidence that children's environment matters in terms of suffering detrimental effects in their health status due to malnutrition.

Results provided by this study shed lights on the importance of governmental interventions in order to tackle the adverse impact of maternal employment on children's nutrition. On the one hand, I showed that early initiation of breastfeeding plays a crucial role in the risk of children being stunted. In this sense, labor policies devoted to mothers after the delivery such as extending the breastfeeding period or developing laws to encourage breastfeeding in the workplace should be relevant to children's health. Consequently, Ecuadorian public health authorities should explore different mechanisms to improve legal support for all working mothers wishing to breastfeed.

More importantly, my estimates suggest that the socio-economic gradient matters in terms of malnourished children. That is, children whose mothers present lower socio-economic levels are more likely to suffer stunting. Similar evidence has been documented by previous literature (Case et al., 2002, 2005; Currie, 2009). In this sense policies should be focused on that particular demographic group because poor and low-skilled mothers tend to spend more time working rather than taking care of their children if they want to meet the basic needs of their households. Thus, the government should design policies to provide conditional monetary transfers or free high-quality childcaring services and therefore, help vulnerable mothers not only to reduce working time but also to increase the time devoted to their children.

The main findings of this study are an important contribution to understand how the participation of mothers in the labor market might impact on children's nutrition in the short run. Nevertheless, notice that the results presented here do not show any long-term consequences of maternal employment on children's malnourishment. In fact, it could be the case that maternal employment leads to a positive net effect on children's health stock in the long run. A deeper understanding of this effect is needed. Also, it is important to be aware that the estimates documented here are based on a cross-section analysis. This implies that surely some time invariant unobserved characteristics are not accounted for, despite the IV – 2SLS strategy is used. The cross-section nature of the data is a limitation here, making impossible to develop a longitudinal analysis.

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Appendix

Table A1. Key variables description

Variable	Description
Stunting	Equals 1 if HAZ is lower than -2 SD, 0 otherwise.
Wasting	Equals 1 if WHZ is lower than -2 SD, 0 otherwise.
Underweight	Equals 1 if WAZ is lower than -2 SD, 0 otherwise.
Overweight	Equals 1 if WAZ is higher than +2 SD, 0 otherwise.
Maternal employment	Equals 1 for wage earners mothers and self-employed mothers working outside the household; and 0 otherwise.
Child's age in months	Determined from date of birth and date of interview.
Early breastfeeding	Equals 1 if the child had an early initiation of breastfeeding, 0 otherwise.
Mother's age	Determined from date of birth and date of interview.
Children in the household	The sum of all under-five years old children living in the household.
Women in the household	The sum of all women between 15 to 65 years old living in the same household of the children.

Table A2. Descriptive statistics, means

Variable	Obs.	Weight	Mean	Std. Error	Min	Max
Child characteristics						
Stunting	18,921	1243697	0.231	0.006	0.000	1.000
Underweight	18,966	1244480	0.052	0.003	0.000	1.000
Wasting	18,286	1203377	0.037	0.003	0.000	1.000
Overweight	18,910	1240977	0.142	0.005	0.000	1.000
Sex (male)	20,204	1311403	0.514	0.006	0.000	1.000
Age in months	20,204	1311403	29.406	0.207	0.000	59.000
Early initiation breastfeeding	20,204	1311403	0.138	0.004	0.000	1.000
Mother's characteristics						
Age	20,204	1311403	28.565	0.091	11.000	71.000
Height	19,117	1240977	154.147	0.108	110.500	199.000
Household characteristics						
Paternal employment	18,921	1243697	0.747	0.007	0.000	1.000
Children in the household	18,339	1204357	1.267	0.008	0.000	4.000
Women in the household	18,921	1243697	1.452	0.010	0.000	8.000
Area of residence (urban)	18,921	1243697	0.683	0.007	0.000	1.000
Overcrowding	18,921	1243697	0.254	0.007	0.000	1.000
Not appropriate excreta disposal	18,921	1243697	0.236	0.009	0.000	1.000
Safe water to drink	18,828	1239204	0.342	0.008	0.000	1.000

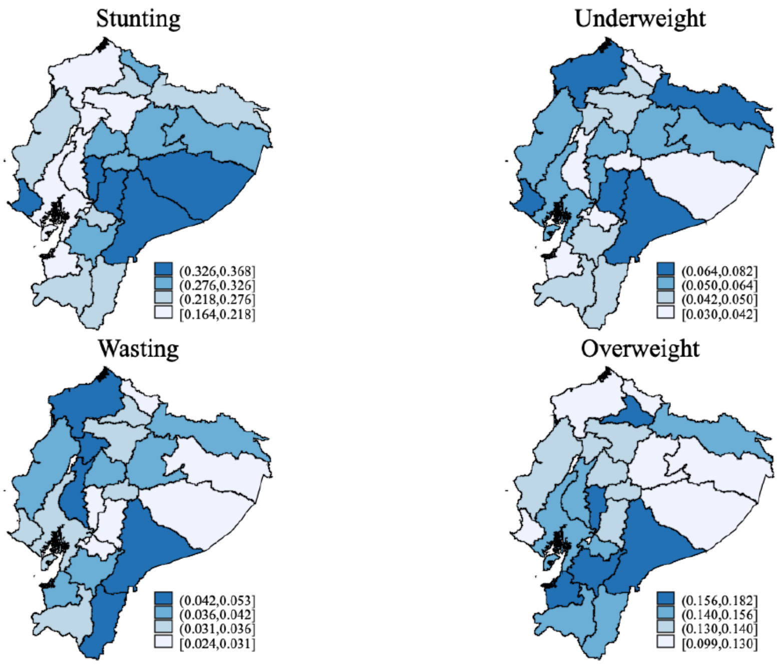
Source: ENSANUT 2018

Table A3. Descriptive statistics, proportions

Variable	Obs.	Weight	Mean	Std. Error
Activity condition				
Employed	20,204	1311403	0.435	0.007
Unemployed	20,204	1311403	0.047	0.003
Inactive	20,204	1311403	0.517	0.007
Level of education				
Non-education/primary	20,204	1311403	0.244	0.006
Secondary	20,204	1311403	0.540	0.007
Tertiary	20,204	1311403	0.216	0.006
Marital status				
Married or union	20,201	1311350	0.798	0.006
Divorced	20,201	1311350	0.102	0.005
Single	20,201	1311350	0.100	0.004
Familiar income quintile				
Lowest	20,199	1310726	0.201	0.006
Second	20,199	1310726	0.204	0.006
Middle	20,199	1310726	0.196	0.005
Fourth	20,199	1310726	0.200	0.005
Highest	20,199	1310726	0.200	0.006
Ethnicity				
Indigenous	20,204	1311403	0.090	0.004
Black	20,204	1311403	0.042	0.003
Montubio	20,204	1311403	0.051	0.003
Mestizo	20,204	1311403	0.803	0.006
White	20,204	1311403	0.014	0.002

Source: ENSANUT 2018

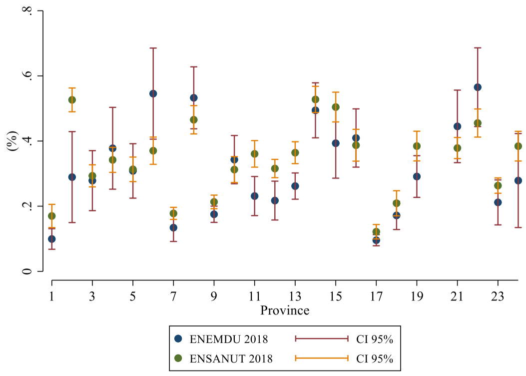
Figure A1. Malnutritional outcomes over province, ENSANUT 2018



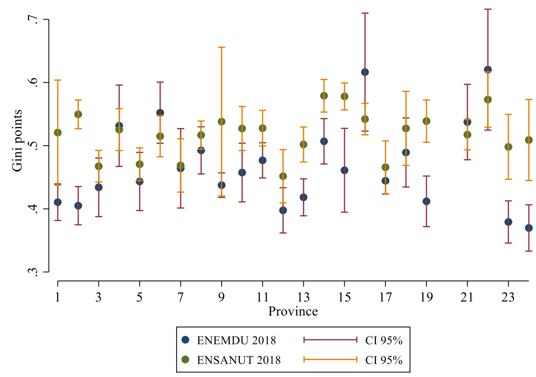
Source: ENEMDU 2018

Figure A2. Provincial-level covariates comparison ENSANUT 2018 vs ENEMDU 2018

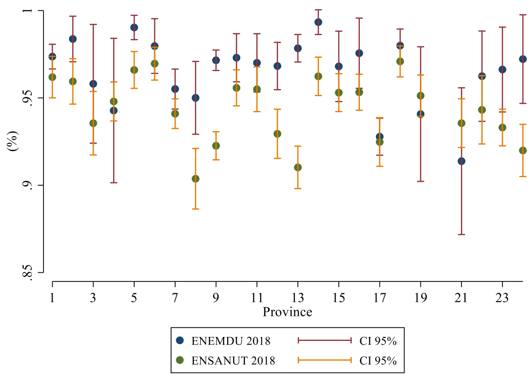
Panel A: Employment rate



Panel B: Gini coefficient index



Panel C: Poverty rate



Source: ENEMDU 2018, ENSANUT 2018

Table A4. First stage of the IV-2SLS: baseline specification

Variables	(1) **Maternal employment** Model 5
Instrument (cantonal-level women employment)	0.859*** (0.033)
Child's sex (male)	0.005 (0.006)
Child's age in months	0.005*** (0.001)
Child's age in months square	-0.000*** (0.000)
Early breastfeeding	-0.002 (0.014)
Mother's age	0.050*** (0.004)
Mother's age square	-0.001*** (0.000)
Mother's height	-0.001** (0.001)
Education (non- or primary education)	
Secondary education	-0.003 (0.008)
Tertiary education	0.079*** (0.012)

Marital status (married or in union)	
Divorced	0.202***
	(0.016)
Single	0.146***
	(0.016)
Paternal employment	-0.069***
	(0.013)
Children in the household	-0.009
	(0.007)
Women in the household	-0.016***
	(0.005)
Area of residence (urban)	-0.035***
	(0.008)
Overcrowding	0.029***
	(0.008)
Not appropriate excreta disposal	0.026***
	(0.008)
Safe water to drink	-0.016**
	(0.007)
Family income quintile (poorest)	
Second	-0.024**
	(0.010)
Middle	0.032***
	(0.011)
Fourth	0.156***
	(0.011)
Highest	0.341***
	(0.012)
Ethnicity (mestizo)	
Indigenous	0.173***
	(0.011)
Black	-0.013
	(0.017)
Montubio	-0.031*
	(0.017)
White	0.005
	(0.029)
Cantonal-level poverty	0.264***
	(0.027)
Cantonal-level inequality	-0.127***
	(0.045)
Constant	-0.789***
	(0.104)
Observations	18,060
R-squared	0.232

Notes: Standard errors in parentheses clustered by primary sampling units. *** p<0.01, ** p<0.05, * p<0.1. The IV – 2SLS first stage is the same for all nutritional outcomes (i.e., stunting, underweight, wasting, and overweight).