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# How to save lives during the first 1000 days of life? Impact analysis of cash transfers on stunting. Evidence from Ecuador

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# How to save lives during the first 1000 days of life? Impact analysis of cash transfers on stunting

Evidence from Ecuador

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**Abstract:** This study examines the impact of Ecuador’s “*Bono 1,000 días*” (1,000 Days Bond), an unconditional cash transfer programme that includes a conditional component, aimed at reducing childhood stunting. Implemented in 2022, this programme targets pregnant women and children up to two years old living in poverty, providing them with financial assistance to improve early childhood nutrition and health outcomes. Using administrative data from July 2022 to June 2024 and applying a fuzzy regression discontinuity design, we analyse the programme’s effectiveness by estimating changes in height-for-age Z-scores among beneficiaries. Our findings suggest a statistically significant increase of approximately half of a standard deviation in height-for-age Z-scores for children identified as poor. These results underscore the critical importance of investing during the first 1,000 days of life to prevent stunting and improve children’s long-term health and developmental prospects. The insights gained from this research provide valuable implications for the design of effective cash transfer programmes in other countries.

**Key words:** childhood stunting, cash transfer programmes, 1,000 Days Bond, early childhood development, fuzzy regression discontinuity, Ecuador

**JEL classification:** I38, I15, C21, O15

**Note:** This paper, initially published on 13 November 2025, was subsequently replaced with a slightly revised version on 10 December 2025. The authors implemented several editorial modifications and corrections to the results tables to ensure complete consistency and accuracy of the analysis.

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# 1 Introduction

The World Health Organization (WHO) estimated that around 149 million children under the age of five suffered from stunting in 2022, globally (World Health Organization 2024). Stunting, a condition resulting from chronic malnutrition, can have severe consequences for children's physical and cognitive development (United Nations Children's Fund 2023b).

In Latin America, it was estimated for the year 2022 that 11.5% of children under 5 years old suffer from stunting, which is nearly three times lower than in Africa, two times less than Asia but four times higher than in Western Europe, representing 5.7 million children. Under the calculations for the year 2022 of Joint Child Malnutrition Estimates, Ecuador ranks among the top three countries in the region with the highest prevalence of stunting in children under five years old, below Guatemala and ahead of Haiti (United Nations Children's Fund 2023b).

In Ecuador, a specialized survey aims to generate indicators on children's nutrition: the National Survey on Children Undernutrition (*Encuesta Nacional sobre Desnutrición Infantil- ENDI*) which focuses on children under the age of five. The first round of the survey was conducted for the years 2022-2023 and the second round for the years 2023-2024. The main finding from the second round at the national level is that stunting prevalence is estimated to be 19.3%. In rural areas, the same indicator reaches 22.1%, which is 4.5 percentage points higher than in the urban areas (Instituto Ecuatoriano de Estadística y Censos (INEC) 2024).

The Ecuadorian government implemented a cash transfer policy called *Bono 1,000 días* to address this challenge. The background session describes the policy design and eligibility conditions. This paper examines whether *Bono 1,000 días* cash transfer reduced stunting among its beneficiaries. This is important because it contributes to a better understanding of inequality in child health outcomes in Ecuador but also contribute to broader debates on social and economic determinants of stunting in developing countries.

Applying a fuzzy regression discontinuity (FRD) design we examine whether the programme improved child nutritional outcomes. We find a statistically significant increase of about half of a standard deviation in height-for-age Z-scores (HAZ) among children identified as poor.

The implications of this study for public policy, extend beyond Ecuador, providing reference for designing cash transfer strategies with higher effectiveness in other countries.

To the best of our knowledge, there has been limited causal research conducted in this area; therefore, this study also contributes to the literature that includes impact analysis using cutting-edge methodologies applied to health. By leveraging a FRD, this research provides valuable insights into the design and implementation of effective cash transfer programmes to address stunting and promote child development.

The paper proceeds as follows: section 2 presents the programme background, section 3 reviews the literature, section 4 describes the data, section 5 outlines the methodology, section 6 reports the results, section 7 concludes with policy implications. An appendix provides additional material.

## 2 Programme background

On June 1, 2022, the Ecuadorian government implemented the *Bono 1,000 días* through Executive Decree No. 435, which established a programme designed to improve child health and nutrition, by delivering an unconditional cash transfer to pregnant mothers and children up to two years old. The programme includes a conditional component, which will be explained in the following paragraphs and aims to capitalize on the opportunity window that presented by the intervention during this life stage.

The preconditions are, among others, the following: a) children or mothers should be considered as poor or extremely poor; b) they should not be receiving any other social benefits or money transfer with any conditional component. This approach is included in the *Estrategia Nacional Ecuador Crece sin Desnutrición Crónica Infantil: Avances de la política pública orientada al abordaje de la desnutrición crónica infantil* (National Strategy Ecuador grows without Stunting). The strategy implementation and the bond tracking are carried out by the Ecuador Grows without Malnutrition Secretariat (STECSDI) in a coordinated work with the Ministry of Health (MSP), and the Ministry of Economic and Social Inclusion (MIES) (Secretaría Técnica Ecuador Crece sin Desnutrición Infantil 2023).

Among other conditions to meet, mothers must attend medical evaluations at a public facility so that the Ministry of Health can follow the child development. During the implementation of the programme, it is important to differentiate two roles: the beneficiary and the recipient. During gestation and after birth, the mother functions as the recipient, while the child is always the beneficiary. In some specific cases, the father can also be designated as recipient (Secretaría Técnica Ecuador Crece Sin Desnutrición 2024).

In the case under study, as of 1 February 2025, data from STECSDI indicate that 123,732 children under the age of two had benefited from the programme. Relying primarily on administrative records, the government identifies eligible children beginning from the prenatal stage.

Table 1 outlines the milestones that each pregnant woman or a mother of children up to 24 months old must accomplish to be considered as a recipient (Gobierno de Ecuador 2022):

**Table 1: Bono 1,000 días- milestones**

Milestone		Payment
Unconditional cash transfer based on the RS score during the first two years		50 US dollars
1	Prenatal care medical evaluations (at least 3) On- time civil registration of live birth (within the first 45 days after birth)	90 US dollars (10 US dollars each month of pregnancy)
2	Monthly medical evaluations- <i>Controles de niño sano</i> (at least 6)	120 US dollars (10 US dollars per each)
3	Monthly medical evaluations (at least 4)	120 US dollars (10 US dollars per each)

Note: the cash transfer programme comprises two types of money transfers: unconditional and conditional, the latter referred to as a “milestone”. The unconditional transfer is granted when the mother meets the required social registry (*registro social*- RS) score that ranks her as poor (Gobierno de Ecuador 2022).

Source: authors' compilation based on Gobierno de Ecuador (2022). *Decreto ejecutivo 435*.

For the first milestone, the mother will receive a total of 90 USD if she attends the prenatal care medical evaluations and registers the newborn at the Civil Registration Office. For the second and third milestones, recipients will receive 10 USD per month if they attend monthly medical evaluations for the child. A total of 120 USD will then be delivered cumulatively in a single payment. When the mother was not identified while pregnant, and the child is up to 45 days born, they will receive the same conditional benefits henceforth (Gobierno de Ecuador 2022).

In summary, our study hypothesizes that the 1,000 Days Bond cash transfer programme can effectively reduce stunting rates among children in Ecuador. To test this hypothesis, we implemented a fuzzy regression discontinuity (FRD) design, by using the data available in administrative records of the STECSDI, covering the period from July 2022 until June 2024. The dataset compiles socioeconomic information and has the information needed to rank people as poor to define the beneficiaries of social transfers and bonds. Personal data were anonymized, and the information was ethically analyzed.

### **3 Literature review**

To achieve the Sustainable Development Goal of Zero Hunger by 2030, governments must reverse the current trend and take immediate action. Regarding the strategies, scientific evidence suggests that early childhood interventions, such as appropriate nutrition, early childhood education, and healthcare, are crucial for promoting cognitive development, preventing disabilities and chronic diseases, and fostering healthy growth and social well-being (Alpugan 2024; Capitani et al. 2023; Montenegro et al. 2022; United Nations Children's Fund 2021a, 2021b).

Undernutrition has a significant impact on educational attainment, resulting in an average gap of two years of schooling. It is also associated with higher rates of grade repetition, particularly at the primary level, and is strongly linked to stunting. The most pronounced educational gap, however, becomes evident during secondary education. The consequences for countries include higher healthcare costs and lower productivity. In 2014, the cost of undernutrition was estimated to be 2.6% of the Ecuadorian GDP (Martinez et al. 2024).

Although the early childhood stage is considered from gestation to 8 years of age, it is during the first thousand days that children develop cognitive, language, motor, and social abilities, which will not happen at a later stage of their development. Therefore, the focus of interventions on this opportunity window is crucial (United Nations Children's Fund 2023a).

According to Alpugan (2024), the period between 0-2 years has key developmental milestones like the process of connections between neurons, together with other processes related to motor skills, emotional regulation, and cognitive functions also happen. Consequently, physical neglect can inhibit optimal brain development, develop chronic health problems, and truncate the children's physical and academic abilities.

The United Nations Children's Fund (UNICEF) designed a conceptual framework for a better understanding of the determinants for children's malnutrition. It divides them into three groups: enabling determinants, underlying determinants, and immediate determinants. The first group consists of governance, norms and resources; the second group includes food, practices and services; and the last one is related to diet and care (United Nations Children's Fund 2021b).

In particular, the underlying determinants relevant to the current study include poverty, children's relationships with their parents, and their living environment. These factors can relate to health problems during childhood and later in life (Alpugan 2024; Lopez et al. 2021). These elements play a main role in children's development, concerning care giving and nurturing. However, the environment in which children live is also associated with brain development over and above family-level resources, particularly in brain circuits that support executive function and emotion processing (Hyde et al. 2022).

Parents' education might influence children's risk of stunting; in particular, the mothers' education level (Mulyaningsih et al. 2021). For example, if the parents' education level is low (Belayneh et al. 2020), the risks become higher. Additionally, mother's characteristics such as education level, nutrition, and genetic factors, particularly height, must be taken into consideration to analyze stunting (A. Soliman et al. 2021; Young et al. 2018).

Even though genetics cannot be externally affected, better nutrition can improve children's growth (Saleh et al. 2021). Other relevant factors include maternal behaviour during pregnancy, dietary intake, exposure to risk factors such as tobacco smoke or pollution (N. Soliman et al. 2024), and maternal weight during pregnancy. (Escher et al. 2024).

Conversely, child nourishment is an immediate determinant of their nutritional status and can significantly increase the risk of stunting. This is particularly evident in the case of children who are not exclusively breastfed, as they face a higher risk of stunting (Belayneh et al. 2020; Coyne et al. 2024). In contrast, appropriate complementary feeding—characterized by timely introduction, well-selected foods, and proper food storage and preparation practices—can reduce the risk of stunting (Stewart et al. 2013). In fact, the intake of supplements, such as specialized nutritious foods during the first 1,000 days of life, is associated with a reduction in stunting (Soofi et al. 2024).

In the same vein, it has been proved that there is a strong association between stunting and the socioeconomic background (Mulyaningsih et al. 2021; Yani et al. 2023). To better understand the socioeconomic situation of families in the region, some poverty context needs to be provided. The Economic Commission for Latin America and the Caribbean (ECLAC) estimated that 29.1% of the Latin American population were living in poverty for the year 2023, and 11.4% were living in extreme poverty during the same year (Economic Commission for Latin America and the Caribbean (ECLAC), 2024).

On the other hand, national conditions also affect stunting. This can be considered as an enabling determinant of children's nutrition since developed countries have the resources to conduct programmes to reduce stunting. Evidence shows that higher-income countries tend to have lower rates of stunting among their populations. (Bommer et al. 2019; McGovern et al. 2017; Tamir et al. 2024). Accordingly, poverty increases the risk of stunting among children (Belayneh et al. 2020; N. Soliman et al. 2024), a relationship that is closely linked to household income. For instance, wealthier households are more likely to provide adequate nutrition, and reliable access to sanitation, clean water, and electricity (Mani 2014; Mulyaningsih et al. 2021). Meanwhile, low-income households are consistently associated with a higher risk of child stunting (Ijaiya et al. 2024; Rahma & Mutalazimah 2022).

Hence, governments have made efforts to guarantee children's health by increasing the households' income. The evidence is consistent in the region, as Mexico's *Oportunidades* programme, using a

logit method, proved that Conditional Cash Transfers (CCT) are associated with a higher Z score and lower prevalence of stunting (Fernald et al. 2008). Poverty alleviation due to CCTs of *Juntos* programme in Peru, resulted in an increase of the Z score in boys who benefited from the programme (Andersen et al. 2015), and a reduction in chronic malnutrition (Cahuana Lipa et al. 2024).

Regarding Brazil's *Bolsa Família* programme, evidence obtained using the Prais-Winsten regression method indicates a stationary trend in the results (Andrade-Silva et al. 2024). However, findings from this programme indicate that the caregiver's sex matters; male caregivers are associated with a higher risk of child stunting, even when other related determinants are accounted for (Khan & Patel 2024). Overall, cash transfers (CT) have been proven effective in addressing malnutrition issues (Zembe-Mkabile 2023), and have also emerged as a promising strategy for improving child health in various countries beyond Latin America. Evidence of this has been found not only in South Africa (Oyenubi & Rossouw 2024), India (Patwardhan 2023), in Syrian children living in Turkey (Kesgin et al. 2024), in Tanzania (Rukiko et al. 2023), but also in Kenya where nutrient ingestion has improved (Ongudi et al. 2024). Hence, it is evident that cash transfers have emerged as a promising strategy for improving child health and nutrition in various countries.

## 4 Data

The information used for this research relies on an anonymized analytical database processed by STECSDI, which is part of a monitoring system known as the *Sistema Unificado y Universal de Seguimiento Nominal Para la Lucha contra la DCI-SUUSEN*. This database is compiled from administrative records of various institutions, including the following:

- The General Directorate of Civil Registry, Identification, and Identification (DIGERCIC) which provides unique ID numbers and live birth records.
- The Ministry of Public Health (MSP) with records related to medical care, medical appointments attendance, vaccinations, and outpatient care.
- The Ministry of Economic and Social Inclusion (MIES), with a compilation of archives with information about development services and bond beneficiaries.
- The Social Registry Unit (RS) with information about family, household characteristics, poverty scores, integrating social, economic, and demographic information at the family level.

Historical data records about the beneficiaries of the STECSDI's Future Childhood Cash Transfer (*Bono Infancia Futuro 1,000 días*).

## 5 Methods

The identification strategy is based on a regression discontinuity design that compares the nutritional status of children from households that receive the *Bono 1,000 Días* with those of non-beneficiaries households, using a cutoff point of 29.77402 for extreme poverty, according to the Identification System for Beneficiaries of Social Programs (SELBEN) from the RS (Ministerio de Inclusión Económica y Social 2019).

The first group has a SELBEN index below 29.77402 (which denotes poverty), and the second comprises households just above the cutoff, who do not receive the cash transfer. The latter group serves as a valid counterfactual for estimating what the nutritional status of the beneficiary children would have been in the absence of the programme.

The assignment variable  $D_i$  is binary and takes the value of 1 if the household's SELBEN score is less than the cutoff (i.e., the household is classified as extremely poor), and 0 otherwise. Table 2 presents the distribution of children according to eligibility status and receipt of the *Bono 1,000 Días* around the threshold. We use a bandwidth of approximately  $\pm 5$  points in the SELEBN score, from 25 to 35. In the main analysis of the effects of the *Bono 1,000 Días*, including the parametric estimates, we restrict the sample to children with height-for-age in households scoring within this interval. This restriction yields a sample of 52,073 children, which constitutes our main analysis sample. For the non-parametric estimates, the bandwidth around the cutoff varies and is determined through data-driven bandwidth selection, using the mean squared error (MSE)-optimal bandwidth selector (Calonico et al. 2017).

Among those non-eligible, 24,032 children did not receive the treatment, while only 6 did. In contrast, among eligible households, 21,737 children did not receive the treatment and 6,298 did. This reveals a substantial group of eligible individuals who did not receive the transfer, suggesting imperfect compliance with the eligibility rule. In total, based on the treatment variable, we observe 45,769 untreated children and 6,304 treated children. Figure A1 and Table A1, in the appendix, present descriptive statistics of the outcome variable, the height-for-age Z-score. For untreated children, the mean Z-score is -0.9432, whereas for treated it is -0.7817. Furthermore, the kernel density estimate of the Z-score in Figure A1 shows that the distribution of treated units is slightly shifted to the right compared to the control group.

Due to this non-deterministic treatment assignment—where eligibility does not strictly determine treatment receipt—this study adopts a fuzzy regression discontinuity (FRD) design, allowing for a more accurate estimation of causal effects under these conditions.

The treatment  $D_i$  is assigned to those whose score  $X_i$  is below a cutoff  $x_o$  and not to those whose score is above that threshold.  $D_i$  takes the value of one for those below the cutoff and of zero for those who are above the cutoff. We can estimate a local average treatment effect (late) by using individuals with scores just above the threshold as counterfactuals for individuals with scores just below it (M. D. Cattaneo et al. 2017; M. Cattaneo & Titiunik 2022).

**Table 2: Relationship between the eligibility rule and the receipt of the *Bono 1,000 Días* around the threshold.**

Treatment status	Eligible		Total
	0.00	1.00	
0	24,032	21,737	45,769
1	6	6,298	6,304
Total	24,038	28,035	52,073

Source: authors' calculations based on anonymized data from STECSDI.

In this case, the treatment variable represents the probability of receiving the treatment. Based on various plausible assumptions, treatment levels that are close to the cutoff point can be considered

arbitrarily assigned. Although the cutoff point may be related to potential outcomes, this relationship is expected to be smooth, allowing effective comparison between groups just above and below the threshold (G. Imbens & Kalyanaraman 2012; G. W. Imbens & Lemieux 2008).

According to Lee and Card (2008), the regression discontinuity (RD) design is considered one of the methodologies with the highest internal validity among quasi-experimental methods. There are two types of designs:

- 1) The sharp design (SRD), which occurs when the treatment probability experiences an increasing discontinuity from 0 to 1 and the treatment status is a deterministic function of the assignment variable;
- 2) The fuzzy regression discontinuity (FRD), which occurs when the probability increases, but not from 0 to 1.

To achieve the research purpose, we implemented a fuzzy regression discontinuity (FRD) design to estimate the impact of the Bono 1,000 días on the stunting rate of poor Ecuadorian children under two years of age. As is characteristic of this type of methodology, treatment assignment is probabilistic rather than deterministic. This feature is clearly illustrated in Figure A3 of the appendix, which depicts the discontinuity in the probability of receiving the treatment at the threshold. The figure shows a clear and significant jump in treatment probability precisely at the cutoff: children from households just below the poverty threshold (the eligible group) exhibit a substantially higher likelihood of receiving the cash transfer compared with those just above the threshold (the non-eligible group).

A regression discontinuity (RD) design is suitable for studies in which a numerical score is assigned to a group of units, and treatment is administered based on a predetermined classification rule. This rule establishes a cutoff point, effectively dividing the units into treated and non-treated groups (Calonico et al. 2014; M. Cattaneo & Titiunik 2022). Two are the basic designs for the RD regression models: sharp and fuzzy (G. W. Imbens & Lemieux 2008; Lee & Lemieux 2010).

Equation (1) models the potential treatment effect as follows (G. W. Imbens & Lemieux 2008):

$$P(W_i = 1 | x_i) = \begin{cases} g_0(x_i), & \text{si } D_i = 0 \\ g_1(x_i), & \text{si } D_i = 1 \end{cases} \quad (1)$$

Where  $g(.)$  represents polynomial functions that are uniformly defined in the neighborhood  $(x_0 - h; x_0 + h)$  of the cutoff, with varying slopes on either side of the cutoff and  $g_1(x_i) \neq g_0(x_i)$ . It is expected that the variable  $D_i = 1 (x_i \geq x_0)$  is correlated with the treatment status  $W_i$  and the indicator variable can only affect outcomes through it. The values of  $D_i$  are considered locally random near the cutoff.

Therefore,  $D_i$  can be employed as an instrumental variable (IV) for  $W_i$ , and the local treatment effect can be estimated using the 2SLS approach. The first stage and reduced-form expressions are framed as follows in equations (2) and (3) (G. W. Imbens & Lemieux, 2008):

$$W_i = g(x_i) + \pi D_i + \mu_i \quad (2)$$

$$Y_i = f(x_i) + \rho D_i + \pi Z_i + v_i \quad (3)$$

Where  $g(\cdot)$  and  $f(\cdot)$  represent uniform functions of  $x_i$ , defined by low-order polynomials with varying slopes on either side of the cutoff. Additionally,  $Z_i$  represents a vector of covariates that controls the effects of pretreatment characteristics. The parameter  $\rho$  evaluates variations in the outcome for compliers closest to the cutoff, while  $\pi$  estimates the discontinuous jumps in the probabilities of being affected by the treatment at the cutoff (G. W. Imbens & Lemieux 2008).

Equation (4) models the **Local Average Treatment Effect (LATE)** around the cutoff point.

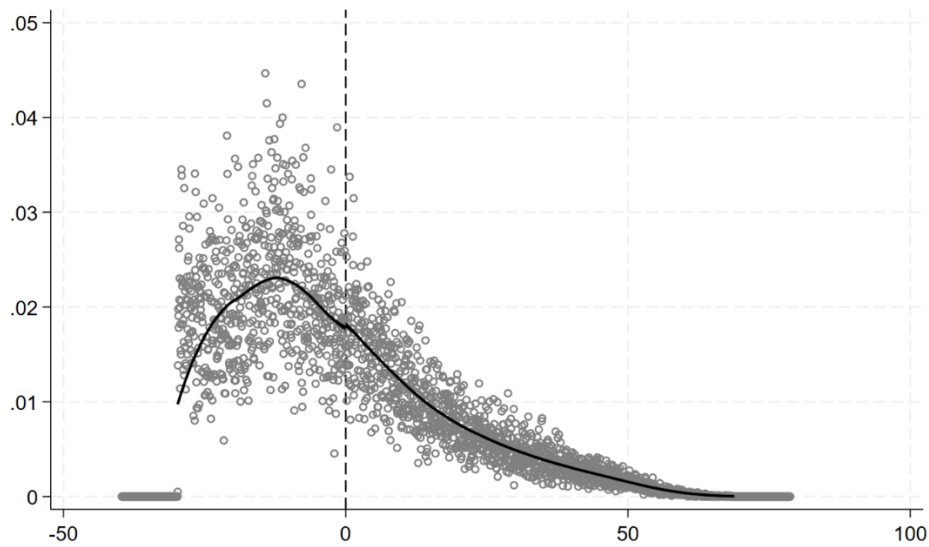
$$\tilde{\tau}_{FRD} = \frac{\lim_{x \downarrow x_0} E[Y_i | x_i = x] - \lim_{x \uparrow x_0} E[Y_i | x_i = x]}{\lim_{x \downarrow x_0} E[W_i | x_i = x] - \lim_{x \uparrow x_0} E[W_i | x_i = x]} \quad (4)$$

Where the numerator estimates the discontinuous variation in the outcome at the cutoff point, and the denominator estimates the jump in treatment levels at the cutoff point. The parameter  $\tilde{\tau}_{FRD}$  represents the local Wald estimator (LWE) for LATE, which estimates the average effect of a unit change in treatment levels (Lee & Lemieux 2010). Compliers are defined as individuals who receive treatment if their  $x_i$  is located at or below the cutoff point (see table 2).

Figure 1 shows the density of the assignment variable (RS Score) used to determine eligibility for the *Bono 1,000 Días*. Visual inspection of the graph suggests that there is no evident discontinuity in the distribution of observations around the cutoff. However, results from the formal McCrary (2008) density test indicate a statistically significant discontinuity at the threshold. This suggests that, despite the absence of a visible jump in the density plot, there may be some sorting or manipulation of the assignment variable around the cutoff.

In Figure A4 of the appendix, we present the balance test of observable characteristics around the threshold, using a bandwidth of  $\pm 5$  in the SELBEN score. The results show no statistically significant differences in the gender of the child (male), the mother's education, the proportion of the indigenous population, or the mother's age. These findings suggest that observable characteristics are balanced around the cutoff, providing support for the validity of the assignment rule as an instrument in the regression discontinuity design.

**Figure 1: McCrary manipulation test**



Note: with a bin size of 0.04 and a bandwidth of 9.85 the density of the assignment variable, the RS index, does not show significant differences around the cut-off.

Source: authors' calculations based on anonymized data from STECSDI.

The identification strategy relies on the assumption that the average outcome of individuals situated just above the cutoff provides a valid counterfactual for those positioned just below the cutoff (G. W. Imbens & Lemieux 2008). The outcome variable is the height-for-age Z-score (HAZ), which measures children's height or length, standardized by age. The covariates included in the model are the child's age, gender, and ethnicity, as well as the mother's age and educational attainment.

In addition to the parametric specifications, we implemented non-parametric fuzzy regression discontinuity estimates using local polynomial regressions with a triangular kernel and mean squared error (MSE)-optimal bandwidths on either side of the cutoff, as recommended by Calonico, Cattaneo, and Titiunik (2014). This approach provides bias-corrected and robust confidence intervals, enhancing the reliability of the estimates and reducing sensitivity to bandwidth selection. These non-parametric estimates allow for greater flexibility in modelling the relationship between the assignment variable and the outcome, reinforcing the internal validity of the design.

## 6 Results

**Table 3: Parametric estimates of the effect on the height-for-age Z-score**

	(1)	(2)	(3)	(4)
	HAZ	HAZ	HAZ	HAZ
b_mil	0.448*** (0.0920)	0.493*** (0.107)	0.499*** (0.107)	0.493*** (0.107)
rs	0.0420 (0.0413)	0.0509 (0.0431)	0.0494 (0.0430)	0.0487 (0.0430)
rs2	-0.000462 (0.000688)	-0.000623 (0.000717)	-0.000598 (0.000716)	-0.000590 (0.000716)

1.p_sexo	0 (.)	0 (.)	0 (.)	0 (.)
2.p_sexo	0.158*** (0.0101)	0.159*** (0.0105)	0.161*** (0.0105)	0.161*** (0.0105)
1.educ		0 (.)	0 (.)	0 (.)
2.educ		0.266 (0.341)	0.281 (0.341)	0.270 (0.342)
4.educ		0.0772 (0.0894)	0.0939 (0.0890)	0.0950 (0.0894)
5.educ		0.137 (0.0901)	0.148 (0.0897)	0.156 (0.0902)
6.educ		0.199* (0.0886)	0.211* (0.0882)	0.218* (0.0887)
7.educ		0.190* (0.0909)	0.201* (0.0905)	0.207* (0.0910)
8.educ		0.317*** (0.0908)	0.324*** (0.0904)	0.330*** (0.0909)
9.educ		0.282** (0.0899)	0.295*** (0.0895)	0.291** (0.0898)
10.educ		-0.0107 (0.275)	-0.00714 (0.274)	-0.0275 (0.273)
1.etnia			0 (.)	0 (.)
2.etnia			0.543*** (0.0412)	0.546*** (0.0412)
3.etnia			0.292*** (0.0312)	0.295*** (0.0312)
edad_madre				0.00322*** (0.000846)
_cons	-1.888** (0.621)	-2.204*** (0.653)	-2.490*** (0.653)	-2.565*** (0.652)
N	52073	47763	47763	47763

Standard errors in parentheses \* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001.

Note: the parametric estimates of the effect of the “Bono 1,000 Días” on HAZ are obtained using a bandwidth of  $\pm 5$  in the SELBEN score. The specifications progressively add controls: Column (1) controls for the child’s gender; Column (2) adds the mother’s education; Column (3) further includes the mother’s ethnicity; and Column (4) additionally controls for the mother’s age. These estimates are based on a fuzzy regression discontinuity design, using the assignment rule as an instrument for treatment.

Source: authors’ calculations based on anonymized data from STECSDI.

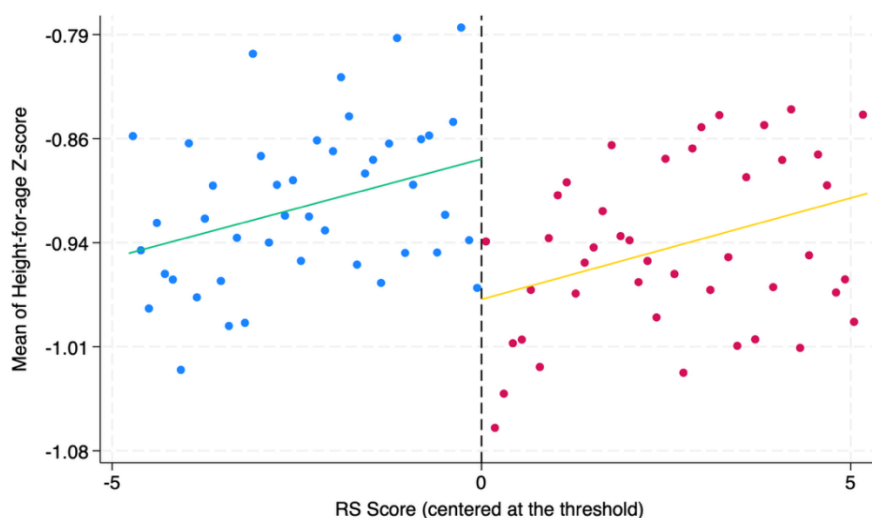
Table 3 presents the parametric estimates of the impact of the *Bono 1,000 Días* cash transfer programme on height-for-age Z-scores using a fuzzy regression discontinuity design. We focus on the

coefficient associated with the variable  $b\_mil$ . Across all specifications, the estimated effect remains robust, ranging from 0.448 to 0.499, and is statistically significant at the 0.1% level. The results are robust to the inclusion of children’s and mothers’ covariates. The most conservative estimates suggest an average increase of approximately half of a standard deviation in HAZ among children identified as poor and eligible for the transfer.

In line with the parametric estimates presented in Table 3, Figure 2 provides visual evidence of a discontinuity in the height-for-age Z-scores at the eligibility threshold. Specifically, we observe a clear upward shift in HAZ for children just below the cutoff point (eligible group), indicating better nutritional outcomes compared to those just above the threshold.

This jump aligns closely with the estimated average treatment effect, suggesting that the *Bono 1,000 Días* cash transfer programme is associated with a meaningful improvement in children’s growth among the targeted population. Figure A2 in the Appendix displays the discontinuity in HAZ at the exact eligibility cutoff, using a bandwidth of  $\pm 10$  points in the RS score. The figure provides visual support for the presence of a jump in the outcome variable around the threshold.

**Figure 2: Discontinuity of height-for-age Z-score at the threshold (bandwidth:  $\pm 5$  RS Score)**



Source: authors’ calculations based on anonymized data from STECSDI.

These findings are consistent with previous evidence on early childhood cash transfer programmes. For instance, Hoddinott et al. (2008) found that nutritional interventions in the first two years of life lead to lasting improvements in physical and cognitive development. Similarly, Attanasio et al. (2005) documented positive effects of Colombia’s *Familias en Acción* programme on child growth outcomes.

**Table 4: Non-parametric estimates of the effect on the height-for-age Z-score**

	(1)	(2)	(3)	(4)
	HAZ	HAZ	HAZ	HAZ
Conventional	0.438***	0.440***	0.446***	0.443***
	(0.0847)	(0.0964)	(0.0960)	(0.0960)
Bias-corrected	0.471***	0.465***	0.467***	0.464***
	(0.0847)	(0.0964)	(0.0960)	(0.0960)

Robust	0.471*** (0.0949)	0.465*** (0.108)	0.467*** (0.108)	0.464*** (0.108)
N	165,848	176,836	178,314	179,282

Standard errors in parentheses. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

Note: Table 4 reports the non-parametric fuzzy regression discontinuity estimates, following the approach proposed by Calonico, Cattaneo, and Titiunik (2014), of the effect of the “Bono 1,000 Días” on HAZ. The data-driven optimal bandwidths vary across specifications: 15.15 in Column (1), 17.50 in Column (2), 17.67 in Column (3), and 17.74 in Column (4). Consequently, the total number of observations included in the non-parametric analysis is much larger than in the parametric analysis, since the bandwidth employed is more than three times wider than that used in the main parametric specifications.

Source: authors’ calculations based on anonymized data from STECSDI.

Table 4 shows non-parametric estimates using local polynomial regressions. We found that the *Robust* specification which adjusts for bias and provides robust confidence intervals, yields an estimate of 0.464 (SE = 0.108, see column 4), confirming the parametric results. The consistency of this estimate across conventional, bias-corrected, and robust approaches reinforces the internal validity of the design and highlights the programme’s effectiveness.

The estimated effect size—an increase of approximately 0.5 standard deviations in height-for-age Z-score—is meaningful in the context of early childhood interventions. It aligns with global evidence that targeted financial support during the first 1,000 days is crucial for preventing stunting and promoting long-term development (Grantham-McGregor et al. 2007; Fernald et al. 2008). These results emphasize the value of unconditional cash transfers that incorporates a conditional component as a scalable policy tool to reduce child undernutrition in low- and middle-income countries.

## 7 Conclusions and discussion

The significant impact we found highlights the importance of these results. Investing during the first 1,000 days of a newborn life can prevent a child from falling below the two standard deviations that define stunting. An investment of around 1650-1980 USD per beneficiary can change the life of children and shape their future. The *Bono 1,000 Días* demonstrates that early childhood investments have a significant return on investment, both for individuals and society as a whole.

As stated before, eradicating stunting is still a goal to be achieved, it is a pending debt to children, with incidence on the growth of nations. The implications of this study for public policy could serve as a reference for designing more effective cash transfer strategies in other countries. Not much causality research has been conducted, therefore, this study also contributes to the literature that includes impact analysis using cutting-edge methodologies applied to health. This study provides valuable insights into the design and implementation of effective cash transfer programmes to address stunting and promote child development.

The findings of this study demonstrate the significant potential of cash transfer programmes like the *Bono 1,000 Días* to reduce stunting and improve child health and development in Ecuador. By investing in early childhood, governments can make a lasting impact on the lives of children and contribute to the sustainable development of their nations.

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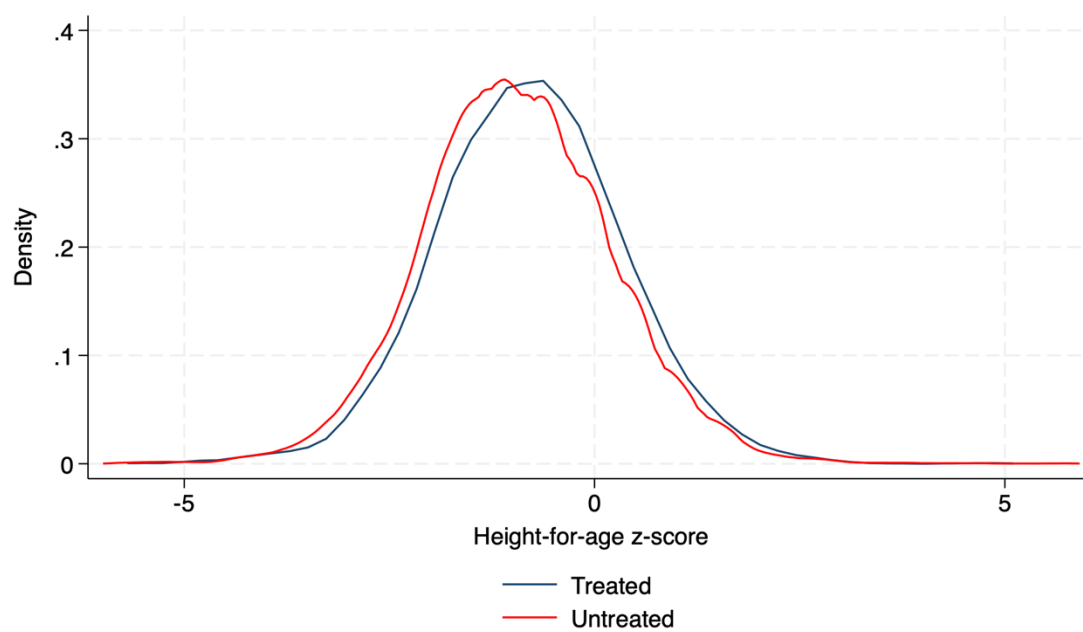
# APPENDIX

**Table A1: Descriptive statistics of height-for-age Z-score, around the threshold (Bandwidth:  $\pm 5$  RS Score), treated and untreated**

	Variable	obs	mean	std.dev	min	max
b_mil = 0	HAZ	45,769	-0.9432454	1.154743	-5.99	5.91
b_mil = 1	HAZ	6,304	-0.781737	1.133457	-5.52	4.93

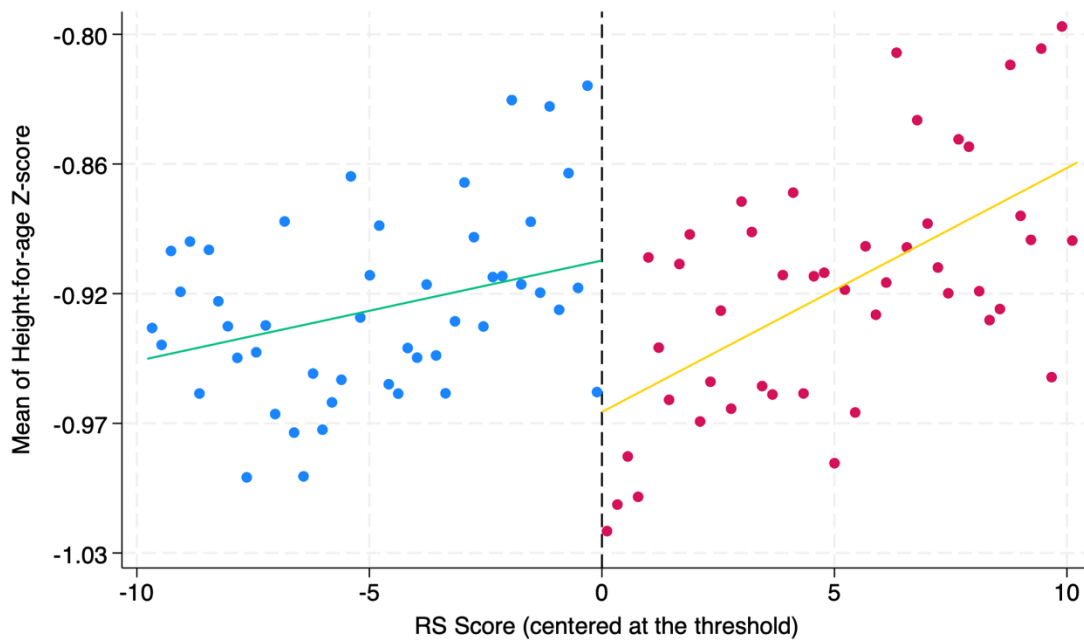
Source: authors' calculations based on anonymized data from STECSDI.

**Figure A1: Kernel density estimates of the distribution of height-for-age Z-scores, around the threshold (bandwidth:  $\pm 5$  RS Score), treated and untreated.**



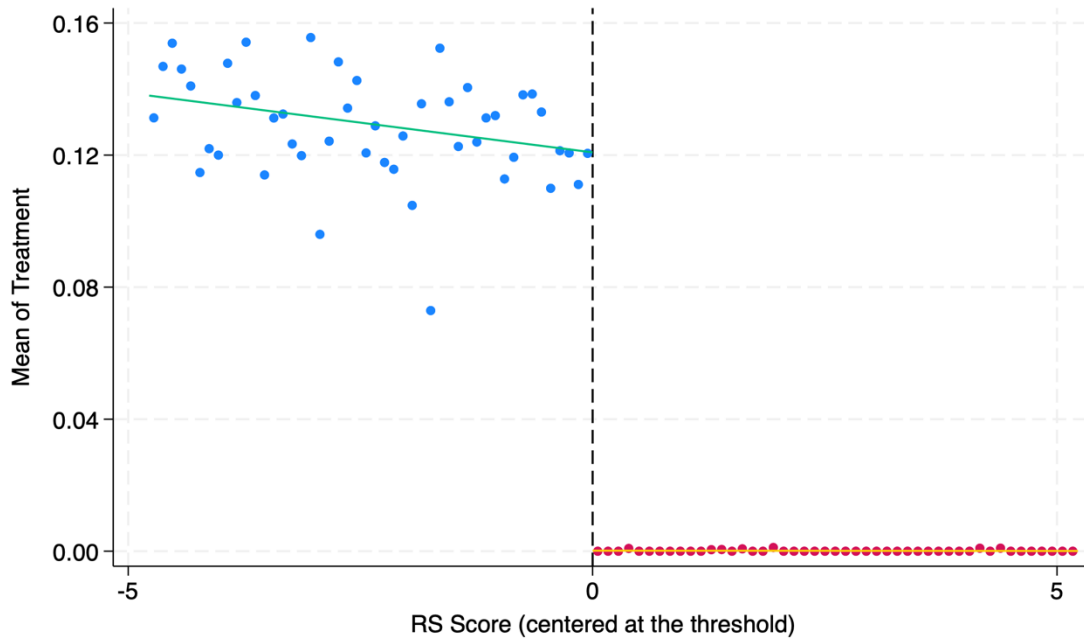
Source: authors' calculations based on anonymized data from STECSDI.

**Figure A2: Discontinuity of height-for-age Z-score at the threshold (Bandwidth:  $\pm 10$  RS Score)**



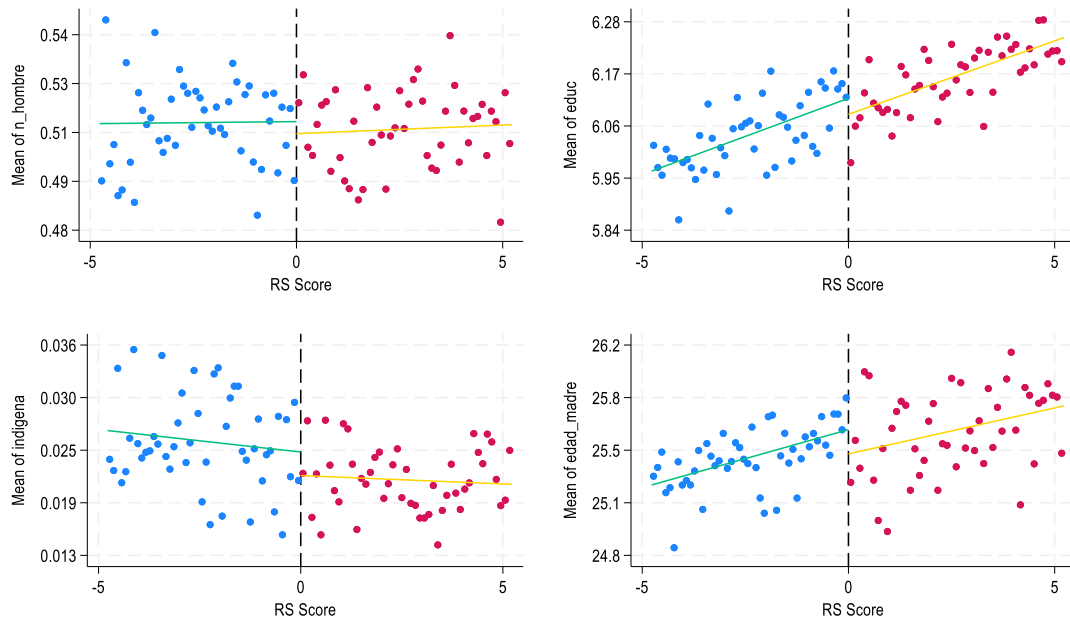
Source: authors' calculations based on anonymized data from STECSDI.

**Figure A3: Discontinuity of probability of treatment at the threshold (bandwidth:  $\pm 5$  RS Score)**



Source: authors' calculations based on anonymized data from STECSDI.

**Figure A4: Balance test of observable characteristics around the threshold (bandwidth:  $\pm 5$  RS Score)**



Source: authors' calculations based on anonymized data from STECSDI.