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The Impact of Health Conditionalities in Conditional Cash Transfer Programmes: the case of the AUH in Argentina

El impacto de las condicionalidades de salud en los programas de transferencias condicionadas de dinero: el caso de la AUH en Argentina

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Abstract

The Universal Child Allowance (AUH) is an Argentine cash transfer programme that conditions payment to parents on the fulfilment of health and education conditions for their children. While the impact of the AUH on education is well known, its effects on health have been less explored. This paper assesses the direct effect of the programme on children attending routine medical exams and receiving scheduled vaccinations, the health conditions of the programme, along with indirect health-related outcomes to explore the wider potential effects on child health. Using microdata from the Argentine Social Debt Survey (EDSA), a quasi-experimental design is implemented to determine the average treatment effect on AUH recipients. The AUH is found to have no effect on the behaviours on which it is conditioned or on dental visits, but it does increase

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food security. The paper discusses the implications of these findings for the design and implementation of programme conditionalities.

Key words: Maternal and child health; Vaccination; Food Security; Evaluation; Argentina.

JEL Classification: H51; H53.

Resumen

La Asignación Universal por Hijo (AUH) es una transferencia monetaria argentina que condiciona el pago al cumplimiento de condicionalidades en salud y educación de los niños. Mientras que el impacto de la AUH en la educación es bien conocido, los de salud han sido menos explorados. El objetivo del documento es evaluar el efecto directo del programa sobre la realización de exámenes médicos y la vacunación, junto con resultados indirectos relacionados con la salud para explorar los efectos más amplios de la AUH. Utilizando microdatos de la *Encuesta de Deuda Social Argentina* (EDSA), se implementó un diseño cuasiexperimental para determinar el efecto del tratamiento promedio de la AUH. La AUH no tiene efecto sobre los comportamientos en los que está condicionada ni sobre las visitas odontológicas, pero aumenta la seguridad alimentaria. El documento discute las implicaciones de estos resultados para el diseño y la implementación de las condicionalidades del programa.

Palabras clave: salud materno-infantil; vacunación; seguridad alimentaria; evaluación; Argentina.

Clasificación JEL: H51; H53.

Introduction

Conditional cash transfer (CCT) programmes are aimed at breaking the intergenerational cycle of poverty by encouraging parents or caregivers to invest in the human capital of children. Payments are awarded to parents for keeping their children in compliance with health and educational conditions established by the programme. Compliance with these conditions is the vehicle for human capital investment, so the conditions are often related to child health and education, such as receiving vaccinations or attending school.

Argentina's CCT is the Universal Child Allowance (AUH), which was enacted through presidential decree in November 2009. The goal of the AUH was to complement existing social protection programmes such that every child in Argentina be eligible for direct financial assistance from the government (Bertranou and Maurizio, 2012).

This paper focuses on the health conditionalities established by the AUH. The programme establishes two direct health conditions for children: attend age-appropriate medical exams and keep up-to-date with the immunisation schedule. Children six years old or younger are also required to enrol in a specific government healthcare plan, *Plan Nacer / Programa SUMAR*. This condition is not a direct investment in the human capital of the child, but rather it allows a restructuring of the financial relationship between the government, hospitals, and uninsured women and children (Cortez and Romero, 2013). While many evaluations have been carried out on the efficacy of this healthcare plan, few have addressed the health outcomes of the AUH, whose outcomes are particularly relevant given the health conditionalities established by the programme. This paper closes that gap in the literature.

In addition to evaluating the two health outcomes directly tied to the AUH, this paper also considers secondary outcomes that may result from AUH use: specifically, annual visits to the dentist and food security. Dental visits are included in order to represent additional healthcare consumption unrelated to the design of the AUH. While a negative result for dental visits would not indicate that no additional consumption of medical services results from the AUH, a positive result would suggest that the AUH does stimulate additional healthcare consumption. An increase in dental exams alongside an increase in medical exams would indicate that health conditionalities in CCT programmes could result in positive spill-over effects in healthcare consumption. Such a finding would open a novel field of research for future impact evaluations of CCT programmes. Food security refers to whether a family is forced to reduce their food consumption due to economic hardship. Dietary reduction would be detrimental to a child's nutrition and caloric intake. The AUH may alleviate the economic hardship that leads to dietary reduction.

This paper offers both a qualitative and a quantitative analysis of the AUH health conditions. The qualitative analysis scrutinises the legislative charter that sets out the health conditions and explores issues related to the implementation of an enforcement regime for the conditionalities. In the quantitative analysis, a quasi-experimental model is used to determine the

effect of the AUH on the abovementioned health outcomes. The quasi-experiment utilises propensity score matching (PSM) and regression analysis to arrive at an average treatment effect on the group of AUH-recipient children for each outcome. Through PSM, a control group and a treatment group are created synthetically by matching eligible children that have the same propensity for using the AUH based on baseline sociodemographic characteristics. If otherwise similar children exhibit different behaviour depending on whether or not they claim the AUH, then that difference can be attributed to the programme. That difference is then further examined by sociodemographic subgroup, assessing possible heterogeneity of the treatment effect.

The lack of research into the effect of Argentina's cash transfer programme on recipient health is possibly due to the lack of applicable public data. This paper uses data from the *Encuesta de la Deuda Social Argentina* (EDSA), an annual survey conducted by the *Observatorio de la Deuda Social Argentina* (ODSA) that is specifically designed to measure human and social development and includes a module dedicated to child development. Relevant trends in the EDSA data are presented in annual reports (Tuñón, 2016; 2017). These data have also been used previously in impact evaluations of the AUH (Salvia, Tuñón & Poy, 2015).

The paper is structured as follows. The first section details the features of the AUH and examines the legislative charter governing the programme. The second section presents a literature review of the health effects of other CCT programmes. The third section describes the data and the methodology used in this evaluation. The fourth section presents the results of the quasi-experimental impact evaluation. The fifth section discusses these results, critically examines the role of health conditions in CCT programmes, and suggests areas of further research. The final section is a conclusion and summary of the paper.

The AUH: Programme Summary and Health Conditionalities

The AUH is a national CCT programme that has been running continually since its creation by presidential decree in November of 2009[4]. The programme paid AR$1,246 (US$72) per child per month in August of 2017. Each month 80 per cent of the full monthly transfer amount is paid out, and the remaining 20

4 Law 24.717.

per cent accumulates and is released once a year in a lump sum 30-60 days after the child is shown to be compliant with the programme conditions. The payment amount is adjusted periodically for inflation. The payment is given preferentially to mothers. According to the National Administration of Social Security (ANSES), which oversees the programme, by August 2016, the AUH covered 3.9 million children under the age of 18.

A child is eligible for the AUH if neither parent is formally employed—specifically, if neither parent figures in the database of individuals who make social security contributions through their employment. Parents of eligible children may be unemployed, employed in the informal economy, self-employed, or temporary or domestic workers. In the case of the informally employed, wages must be lower than the minimum wage; however, there is no way for ANSES to means test on wages gained in the informal economy. Only five children per adult transfer recipient are eligible for the allowance. Both parent and child must have been Argentine residents for at least three years, and both must have national identity cards.

Eligibility is not the only requirement for receiving cash transfers through the AUH. Parents must also certify that their child is compliant with the health and educational conditions established by the programme. Parents of children of all ages must demonstrate that their child is up-to-date with the immunisation schedule and attending age-appropriate medical exams. Additionally, parents of children six years old and younger must prove that their child is enrolled in a government healthcare plan, and parents of children 5-17 years of age must prove that their child is attending school. Compliance is certified annually by presenting a booklet signed by the relevant authorities at the health establishment or school to ANSES. Failure to certify compliance results in suspension from the programme. The suspension not only prevents parents from receiving the monthly payments for which their child is eligible, but it also triggers the forfeiture of the accumulated yearly lump-sum transfer that would have been paid out if the child were shown to have complied with the conditions.

Since the AUH legislation was passed in 2009, there have been several changes to the health conditionalities. Initially, there were two health conditions: routine medical exams and compliance with the immunisation schedule. By 2011, a third condition was added: enrolment in *Plan Nacer*, a government healthcare plan for children under six years old. In August 2012, *Plan Nacer* was expanded to include children aged up to 19, and this expansion was renamed *Programa SUMAR*. Official AUH material now states that children

under six must be enrolled in *Plan Nacer | Programa SUMAR* despite the latter programme covering children older than six years old.

Additionally, the age to which these conditions correspond has changed over time. In 2009, the health conditions applied to children four years old and younger. By 2011, the health conditions applied to children six years old and younger. In fact, the language used to refer to the ages to which each health condition corresponds is still imprecise. Differences between the way in which the conditions are set out in the legislative charter and how the programme is implemented could affect the ability of the conditionalities to achieve their desired effect.

The legislative charter and implementation materials also confuse or omit important details. For example, the immunisation condition appears to apply only to children under six years of age, but the obligatory immunisation schedule published by the Ministry of Health and cited by ANSES in official AUH material includes vaccinations for 11-year-olds and children 15-18 years old. Further, in contrast to what happens with the immunisation condition, there is no calendar referenced for the frequency of medical exams. In 2017, the Ministry of Health published an exam calendar on its official website for the first time[5]. The calendar recommended a check every month for the first six months of life, and up to 20 visits during the first three years. Since the AUH programme booklet requires the signature of the healthcare professional that sees the child, at least one visit a year is required, but such a frequency appears inappropriate for new-borns and young children.

Salient issues with the AUH health conditionalities include the late addition of a new condition, changes to the conditions over time, vagueness in describing the programme conditions, and the omission of details relevant to the conditions. Identifying these issues provides context for the evaluation that follows. Further context is provided in the next section through a literature review of CCT programme health outcomes.

Literature Review: Health Outcomes for CCT Programmes

CCT programmes have gained tremendous popularity over the past two decades, and the use of these programmes continues to increase. The World Bank (2015)

5 Ministerio de Salud webpage, accessed June 8, 2018: https://www.argentina.gob.ar/salud/crecerconsalud/primermes/controlesdesalud

identifies CCT programmes in 64 countries, up from just two countries in 1997 and 27 countries in 2008. In a comprehensive review of impact evaluation studies, Fiszbein and Schady (2009) conclude that CCTs helped lift families out of monetary poverty and improved some health and educational outcomes of the beneficiary children. This section reviews the health outcomes of CCT programmes similar to Argentina's AUH.

There is a wealth of research on the effect of health conditionalities on the healthcare consumption of children younger than six years old, but less research has been conducted on how cash transfer programmes affect the use of healthcare by older children. With regard to the former, studies by Attanasio et al. (2005a) and Akresh et al. (2012) on Colombia's *Famlias en Acción* and Burkina Faso's cash transfer pilot project, respectively, find that health conditions increased healthcare use by young children, specifically preventative healthcare visits. Similarly, Perova et al. (2012) find that young children that used Peru's CCT programme, *Juntos*, which conditioned payments on children aged 0-6 attending regular health checks, were more likely to have received medical exams in the three months prior to being interviewed and also more likely to have sought medical attention in the event of being ill than similar children that were not beneficiaries of the programme. With regard to studies on older children, Gertler (2000) finds that the requirement of *PROGRESA*, Mexico's CCT program, that children 6-17 years old attend preventative health checks was successful in increasing the healthcare utilisation of that cohort. The present paper considers health outcomes for older children in addition to young children, adding to the broader literature and reducing a persistent gap in scholarship.

With respect to the effect of CCT programmes on vaccinations, Brenzel et al. (2007) and Barham and Maluccio (2009) evaluate the impact of the Mexican *Oportunidades* programme and the Nicaraguan *Red de Protección Social*, respectively. In both cases, the authors find that the programmes increased the rate of vaccination for programme recipients. Attanasio et al. (2005b), again evaluating Colombia's *Familias en Acción*, find that the programme increased the likelihood of adherence to an immunisation schedule for children under 24 months old.

Just as there is little research into the impact of CCT programmes on older children, there has been little research conducted on the effect of cash transfer programmes on consumption of healthcare other than visits to the doctor

or vaccinations. CCT programmes may increase overall healthcare utilisation above that which is prescribed by health conditionalities through an income effect. As families receive additional income, they can spend it on healthcare services that are not provided by the free, public system, or that are provided but with long waiting times, or that were otherwise inaccessible financially before the income transfer. Additionally, and relatedly, consumption of specialized healthcare may increase because physicians at annual medical exams recommend or remind families to pursue such services.

This paper considers one type of specialized care that governments and medical professionals also recommend to be routine: annual dental exams. While examination of the effect of CCT programmes on dental exams is a novel contribution to the literature, there are antecedents in related fields. Beautrais et al. (1982), studying a birth cohort of 4-year-old children in New Zealand, find that routine use of child healthcare services including immunisation and postnatal checks is associated with increased utilisation of dental services. These are the precise conditions established by the AUH, so a similar effect might be expected. Camargo et al. (2012) find for Brazil that children whose parents adhered to the recommended schedule for postnatal medical consultations (nine visits in the first 24 months) were more likely, at age five, to be visiting the dentist as part of a preventative routine. That schedule for medical visits is also what Brazil's CCT, *Bolsa Familia*, establishes as part of its health conditionalities (Gazola Hellmann, 2015). If a CCT programme, particularly one with health conditionalities such as the AUH, is found to have a positive relationship with auxiliary healthcare consumption, the finding would invite further research into other positive, unexpected consequences of CCT programmes, and would have important implications for programme design.

Improved food security is another potential secondary effect of the AUH. One important mechanism through which this can happen is an income effect, given that cash transfers increase the household income and lead to increased consumption. Attanasio et al. (2012) find that *Familias en Acción* increased both household income and the share of that income spent on food. Angelucci et al. (2012) find that *Oportunidades* in Mexico also increased food consumption. Salvia et al. (2015), studying the AUH between 2010-2012, find that the programme did reduce food insecurity. This paper studies whether similar results are obtained following the expansion of *Programa SUMAR* and its integration into the AUH, as well as whether there are heterogeneous effects of the income transfer. The heterogeneous effects examined in this paper include differen-

tial effects based on the age of the child, the presence of the mother in the household, and the level of education attained by the parents or guardian. The study of heterogeneous effects has important consequences for programme design. In the case of the AUH, for example, the government prioritises making payments to mothers. Benhassine et al. (2015) find that gender-targeting a cash transfer labelled for educational expenses does not improve educational outcomes over and above the improvements from non-gender-targeted transfers. However, specific to expenditure on food, Armand et al. (2016) find that targeting mothers as the recipients of a CCT programme with educational controls increases the share spent on food by 4 to 5 per cent.

Another mechanism through which the AUH might improve food security is compliance with the programme health conditions. Attanasio et al. (2005b) examine the impact of *Familias en Acción* on nutrition, measured by the relationship between height and age. The programme conditioned cash payments on children attending preventative health exams and following an immunisation schedule, much like the AUH. The authors find that the programme had a large and significant effect on nutrition, even more than a concurrent and mutually exclusive nursery programme that simply gave children food directly. Since, as is already established, the income effect of cash transfers results in greater food consumption, the comparatively better performance of *Familias en Acción* than the nursery programme in improving nutrition might be attributable to the health conditionalities. This paper continues that investigation by studying the effect on food insecurity of a programme with health conditionalities.

Data and Methodology

Survey, sample parameters, and relevant variables

Research into the AUH in Argentina is usually handicapped by the lack of nationally representative, multi-year sets of data that directly identify AUH recipients. The most common source of data is the *Encuesta Permanente de Hogares* (EPH), which collects primarily labour market information. However, this database does not supply data relevant to child health and does not directly identify AUH beneficiaries. Instead of the EPH, this paper uses survey data from the *Encuesta de la Deuda Social Argentina* (EDSA), conducted annually by the *Observatorio de la Deuda Social Argentina (ODSA)* at the

Universidad Católica Argentina (UCA). The survey is conducted in 20 urban residential areas of more than 80,000 habitants each. The EDSA is designed to measure human and social development and includes a section on child development in which the mother, father, or principal caretaker responds to questions on behalf of each individual child under his or her care.

In the EDSA, AUH use is reported directly and explicitly for each child, and responses are checked and corrected against eligibility requirements andcompatibility with other social programmes. By removing the uncertainty surrounding the identification of AUH beneficiaries without sacrificing the benefits of a large-scale, nationally representative survey, this paper is a valuable contribution to the literature.

The time period considered in this analysis is 2012-2017. The 2010-2011 period was discarded because previous research suggests there was little enforcement of the conditionalities during these years (Maurizio et al., 2014). Additionally, 2010 was the year in which the programme conditionality was changed to include the condition that children through age six be enrolled in the government healthcare plan, and in 2011 programme eligibility was extended to children in private schools. The time period 2012-2017 is the longest period with consistent eligibility, consistent health and education conditionalities, and consistent enforcement of those conditionalities. The age range considered in this evaluation is children aged 3-17. Children younger than three years old are expected to visit the doctor multiple times a year, and the EDSA is not constructed to measure multiple medical visits per year. The final sample includes 12,507 sets of survey responses from children between the ages of three and 17, inclusive, who meet the eligibility requirements of the AUH outlined in the previous section. Of those observations, 58 per cent claim the AUH and 42 per cent do not claim the AUH.

In the analysis that follows, children who receive the AUH are matched with children who do not use the programme, using a set of observable characteristics, also called baseline variables. The matching procedure, described in the following section, is implemented to create treatment and control groups that are on average not statistically significantly different across these observable characteristics. These observable characteristics, or baseline variables, include characteristics of the child, characteristics of the parents or guardian, and characteristics of the household. Child characteristics include the child's sex,

age (3-6 years old, 7-12 years old, and 13-17 years old), whether the child lives with his or her mother, and the per-capita income of the child (by quintile of the per-capita family income distribution). Characteristics of the parents or guardian include the mother or guardian's level of education (incomplete secondary education or less, complete secondary education or more), whether the mother or guardian is young (younger than 25 years old, at least 25 years old), and the head of household's type of employment. The employment categories are designed to take into consideration labour continuity and the social protections afforded to the child through the employment of the head of household[6]. Finally, characteristics of the household include where the household is located (City of Buenos Aires, Greater Buenos Aires, other metropolitan areas, and the rest of the urban interior), whether the household is located in an urban slum or settlement (or *villa*), whether the household is overcrowded (3 or more people per habitable room), whether the dwelling is constructed using low-quality building materials, whether there are members of the extended family living in the household, and the year of the measurement. Table 1A, below, summarises the descriptive characteristics represented by these baseline variables. Table 3, in the Results section, shows the average value of these baseline variables following the matching procedure.

It is also worth describing how the outcome variables are constructed using EDSA data. The survey respondent declares whether the child is up-to-date with vaccinations, but no further questions are asked as to the exact vaccination history of the child. These responses could be inexact if the respondent is not familiar with the immunisation schedule, but this schedule is well publicised throughout Argentina. The survey respondent is also asked how long it has been since the child has had a medical exam (days, months, or years). A response of days or months yields a positive outcome in the medical exam variable; a response of years yields a negative outcome. Two further health-related outcomes that do not figure as programme health conditionalities are also considered. The EDSA asks if a child has seen a dentist or orthodontist in the previous 12 months, and an affirmative response yields a positive

6 The categories are as follows: Full employment refers to employers, dependent employees, or independent employees with continuous labour opportunity, and/or individuals who receive healthcare plans through a labour union (*obras sociales*) on which their children can be included; subemployment refers to individuals with low-paying temporary employment, handymen, or unsalaried or hourly workers that do not receive benefits from employment programmes with work requirements; finally, unemployment includes all individuals without employment, regardless of whether or not they are actively looking for work.

outcome in this variable. Regarding food security, the variable takes a positive value if no individuals in the household have gone hungry in the last year from a reduction of food consumption due to economic difficulties, and takes a value of zero otherwise. These outcome variables are measured at the same time as the baseline variables described above. Table 1B, below, summarises the health outcomes in the full unmatched sample.

Table 1A. Descriptive Characteristics of Unmatched Sample

Baseline Covariate	Unmatched	
	Control (No AUH)	Treatment (Uses AUH)
Sex (=1)		
Male	0.501	0.511
Female	0.499	0.489
Age (=1)		
3-6 years old	0.212	0.338
7-12 years old	0.369	0.402
13-17 years old	0.419	0.261
Education of Mother or Guardian (=1)		
Up to Incomplete Secondary School	0.665	0.671
Complete Secondary School or More	0.335	0.329
Age of Mother or Guardian (=1)		
18-24 years old	0.049	0.099
25 years old or older	0.951	0.901
Employment of Head of Household (=1)		
Full Employment	0.260	0.110
Subemployment	0.535	0.677
Unemployment	0.205	0.213
Region (=1)		
City of Buenos Aires	0.056	0.018
Metro Buenos Aires	0.335	0.281
Other Metropolitan Areas	0.384	0.414
Rest of the Urban Interior	0.225	0.287

(*Continued*)

Table 1A. Descriptive Characteristics of Unmatched Sample

Baseline Covariate	Unmatched	
	Control (No AUH)	Treatment (Uses AUH)
Survey Year (=1)		
2012	0.215	0.145
2013	0.172	0.134
2014	0.152	0.160
2015	0.143	0.159
2016	0.170	0.190
2017	0.148	0.211
Lives with Mother (=1)	0.860	0.972
Lives in Villa, Slum, or Settlement (=1)	0.157	0.165
Overcrowding in Rooms (=1)	0.240	0.300
Poor Housing Material	0.040	0.052
Extended Family in Home (=1)	0.426	0.387
Household Income Quintile	2.609	1.970

Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

Table 1B. Health Outcomes of Unmatched Sample

Health Outcome	Unmatched	
	Control (No AUH)	Treatment (Uses AUH)
Vaccinations	0.977	0.984
Medical Exam	0.683	0.739
Dental Exam	0.507	0.508
Food Security	0.727	0.690

Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

Quasi-experimental Design

As stated in the previous section, the EDSA provides accurate information on who uses the AUH; however, merely comparing individuals who use the AUH to eligible individuals who do not might introduce selection bias. Rosenbaum et al. (1983) propose a technique called propensity score matching (PSM) to overcome this selection bias. Importantly, Diaz and Handa (2006) and Handa

and Maluccio (2010) confirm that the results from evaluation studies of CCTs in Mexico and Nicaragua that use the quasi-experimental PSM design well approximate the results yielded by randomised experiments.

In PSM, the likelihood of a child using the AUH is estimated based on certain observable characteristics. Together, many matched pairs of AUH-recipient children and non-recipients form a treatment group and a control group that are not statistically significantly different from each other in terms of the characteristics used to predict AUH use. Formally, the propensity score is defined as:

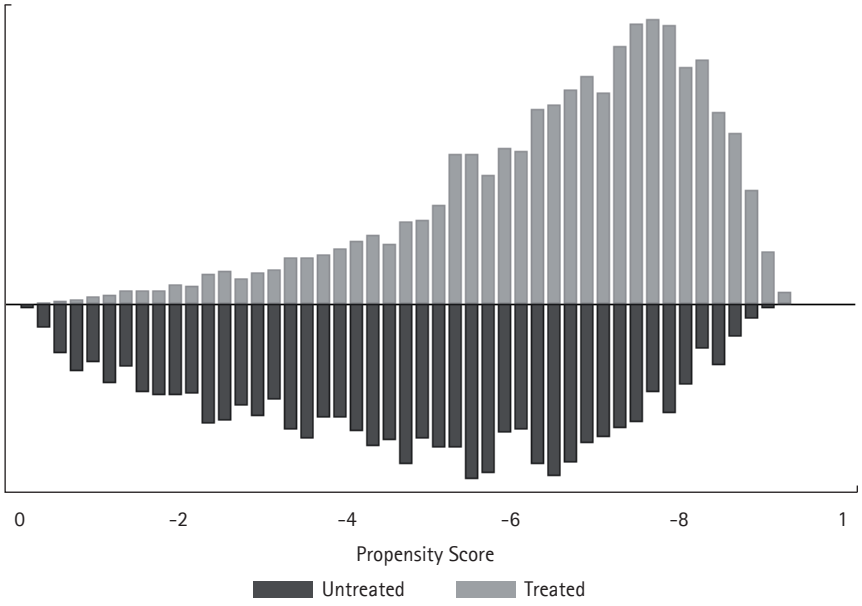
$$P(Z_i) = E(D_i | Z_i), \quad [0 < P(Z_i) < 1] \tag{1}$$

where all i belong to the subset of eligible children, $P(Z_i)$ is the probability of using the programme conditional on a set of Z observable characteristics, and D is equal to one for AUH use and zero for non-use. Functionally, the propensity score for each observation is determined through a logistic regression that predicts the probability of AUH use using a set of baseline variables. The baseline variables used in this analysis are the characteristics of the child, the parent or guardian, and the household outlined in the previous section.

Figure 1 shows the distributions of propensity scores for the full sample of children, divided into groups based on whether they use the AUH (treated) or do not (untreated). The graphs show significant overlap between the two distributions. This overlap is referred to as the area of common support. A treated individual whose propensity score falls outside of the area of common support cannot be matched because there is not an untreated individual with a similar enough propensity score, and vice versa. The following evaluation only includes children within the area of common support.

Because treatment—in this case, AUH use—was not assigned randomly to a population, it is more accurate to refer to the control group as a counterfactual for the treatment group. The control group approximates the outcomes of the treatment group had those individuals not been exposed to the AUH. Thus, this paper does not estimate the treatment effects of the AUH across the whole population but rather the effects of the programme on the treated population. Comparing the mean outcomes of the treatment group and its counterfactual makes it possible to measure the average treatment effect on the treated, or ATET. The ATET can be expressed as follows:

Figure 1. Distribution of Propensity Scores in Unmatched Population



Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

$$ATET = E[Y_{1i} - Y_{0i} | D_i = 1] = E[Y_{1i} | D_i = 1] - E[Y_{0i} | D_i = 1] \quad (2)$$

where the dummy variable D represents whether or not an individual i receives treatment, Y_1 represents the average outcome of individuals who have been treated, and Y_2 represents the average outcome of individuals who have not been treated.

To achieve accurate ATET estimates, the difference between the propensity scores of individuals in a matched pair must be sufficiently small. This paper includes multiple matching methods in order to discard the possibility that any results are the product of the matching specifications used. In every case, matching is carried out with replacement, which means that an untreated individual can be reused in matching multiple times if that individual fits the matching parameters for multiple treated individuals. Dehejia and Wahba (2002) argue that when there is substantial overlap in the propensity score distributions of the treated and control groups, most matching algorithms will yield similar results. Given the propensity score distributions in Figure 1, the evaluation that follows ought to yield convergent results.

The first matching method employed in this paper is called *k*-nearest neighbour matching. This method constructs the counterfactual control group by creating pairs of a treated individual and that individual's *k*-nearest neighbours, where *k* is an integer. Following the conventions of Heckman et al. (1997), this paper considers the nearest five and 10 neighbours. The second matching method is called *k*-nearest neighbour matching with caliper, and it applies the same approach as the previous method with the additional constraint that the propensity score of the matched neighbour be within a certain distance of the propensity score of the treated individual (Cochran and Rubin, 1973). That tolerance level can be expressed as follows:

$$\left|P\left(Z_i\right)-P\left(Z_j\right)\right|<C, \tag{3}$$

where *C* is the specified tolerance, and *i* and *j* are neighbours eligible for matching. Treated individuals with no matches that satisfy the caliper condition are excluded from the analysis. The final matching method, radius matching, builds on the caliper technique while moving away from the restrictions of the *k*-nearest neighbour method. Radius matching pairs all untreated individuals within a specified distance of a treated individual with that treated individual, regardless of how many matched pairs are created for each treated individual (Dehejia and Wahba, 2002).

Smith and Todd (2005) point out that it is difficult to know a priori what level of tolerance *C* is reasonable. The choice of *C* regulates the balance between variance and bias of the ATET estimate: variance decreases as more matched pairs are included in the analysis, and bias decreases as the difference in propensity scores between the matched pairs becomes smaller. Following the convention for one-to-one matching, which would create treatment and control groups of equal sizes, this analysis initially establishes a caliper of .25 times the standard deviation of the propensity score ($C = .05$) (Rosenbaum and Rubin, 1983). However, because this evaluation uses many-to-one matching techniques, a narrower caliper is used for the majority of the matching ($C = .01$).

The matching procedure is successful if it produces treatment and control groups that are otherwise similar except for in exposure to the treatment. This balance is tested by comparing the means of the covariates included in the propensity score estimation between the two groups. Formally, balance is assessed using the standardised difference statistic, which is recommended for many-to-one matching because it is not affected by sample size (Austin, 2008; Austin 2009b). A standardised difference of less than 10 per cent

indicates negligible imbalance in a baseline covariate between treatment and control groups (Austin 2009a).

In the case of a statistically significant ATET for a given outcome, further analysis is conducted to explore the heterogeneity of that effect for certain sociodemographic characteristics. Heterogeneous effects are first explored by calculating the difference by sociodemographic subgroup between the rate of a positive outcome in the treatment and control groups, and measuring the statistical significance of that difference by testing the null hypothesis that the outcome rate of the two groups are the same. Also calculated is the change in the probability of a positive outcome conditional on belonging to a subgroup and using the AUH, holding other covariates constant. This estimate is calculated following Norton and Ai (2004) and further elaborated in Karaca-Mandic et al. (2012). Interaction terms between AUH use and each subgroup of interest are added, individually and sequentially, to a logistic regression of the treatment variable and the baseline covariates on the probability of a positive outcome in the dependent variable.

Results

The results for each matching procedure are presented in Table 2, below. Each set of results includes the relevant health outcomes for the matched treatment and control groups, the ATET estimate provided by the difference between those outcomes, and the standard errors and significance level for each ATET estimate. Table 3 presents the standardised errors for the baseline covariates for each matching procedure to report the comparability of the treatment and control groups.

Table 2. ATET results

Matching Method	Statistic	Health Outcomes			
		Vaccinations	Medical Exam	Dental Exam	Food Security
5-Nearest Neighbours (No Caliper)	Treatment	0.984	0.739	0.507	0.690
	Control	0.985	0.735	0.508	0.668
	ATET (p.p.)	-0.52	0.38	-0.05	2.26
	SE	(.004)	(.011)	(.013)	(.011)
	sig.	n/s	n/s	n/s	**

(*Continued*)

Table 2. ATET results

Matching Method	Statistic	Health Outcomes			
		Vaccinations	Medical Exam	Dental Exam	Food Security
10-Nearest Neighbours (No Caliper)	Treatment	0.984	0.739	0.507	0.690
	Control	0.984	0.737	0.508	0.668
	ATET (p.p.)	0.04	0.15	-0.07	2.26
	SE	(.004)	(.011)	(.012)	(.011)
	sig.	n/s	n/s	n/s	**
5-Nearest Neighbours (Caliper, .01)	Treatment	0.984	0.739	0.507	0.690
	Control	0.985	0.734	0.510	0.668
	ATET (p.p.)	-0.09	0.47	-0.24	2.18
	SE	(.004)	(.011)	(.013)	(.011)
	sig.	n/s	n/s	n/s	*
10-Nearest Neighbours (Caliper, .01)	Treatment	0.984	0.739	0.507	0.690
	Control	0.984	0.736	0.507	0.667
	ATET (p.p.)	0.00	0.24	0.01	2.29
	SE	(.004)	(.011)	(.012)	(.011)
	sig.	n/s	n/s	n/s	**
Radius Matching (Caliper, .01)	Treatment	0.984	0.739	0.507	0.690
	Control	0.983	0.736	0.506	0.665
	ATET (p.p.)	0.08	0.25	0.09	2.52
	SE	(.003)	(.011)	(.012)	(.010)
	sig.	n/s	n/s	n/s	**
Radius Matching (Caliper, .05)	Treatment	0.984	0.739	0.507	0.690
	Control	0.983	0.736	0.507	0.665
	ATET (p.p.)	0.06	0.27	0.02	2.47
	SE	(.003)	(.010)	(.011)	(.010)
	sig.	n/s	n/s	n/s	**

Significance levels: p < .1 * / p < .05 ** / p < .01 ***
Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

Table 2 confirms that the results from the six matching algorithms are consistent with one another, an important point from the previous section. Equally important, Table 3 confirms that the treatment and control groups are similar in terms of the baseline characteristics included in the matching exercises.

Table 3. Standardised Differences of Baseline Covariates

Variable	Treatment (Uses AUH)	5-NN (No Caliper)		10-NN (No Caliper)		5-NN (Caliper, .01)		10-NN (Caliper, .01)		Radius (Caliper, .01)		Radius (Caliper, .05)	
		Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.
Sex (=1)													
Male	0.51	0.51	0.006	0.50	0.013	0.51	0.006	0.50	0.012	0.50	0.014	0.51	0.008
Female	0.49	0.49	0.006	0.50	0.013	0.49	0.006	0.50	0.012	0.50	0.014	0.49	0.008
Age (=1)													
3-6 years old	0.34	0.34	-0.013	0.34	-0.015	0.34	-0.013	0.34	-0.015	0.35	-0.025	0.34	-0.002
7-12 years old	0.40	0.39	0.020	0.39	0.023	0.39	0.020	0.39	0.022	0.39	0.020	0.40	0.009
13-17 years old	0.26	0.27	-0.009	0.27	-0.009	0.27	0.009	0.27	-0.009	0.26	0.003	0.26	-0.007
Education of Mother or Guardian (=1)													
Up to Incomplete Secondary School	0.67	0.68	0.017	0.67	0.003	0.68	0.017	0.67	0.005	0.67	0.001	0.67	0.005
Complete Secondary School or More	0.33	0.32	0.017	0.33	0.003	0.32	0.017	0.33	0.005	0.33	0.001	0.33	0.005
Age of Mother or Guardian (=1)													
18-24 years old	0.10	0.10	-0.024	0.10	-0.011	0.10	-0.024	0.10	-0.014	0.10	-0.022	0.09	0.023
25 years old or older	0.90	0.90	-0.024	0.90	-0.011	0.90	-0.024	0.90	-0.014	0.90	-0.022	0.91	0.023
Employment of Head of Household (=1)													
Full Employment	0.11	0.11	0.005	0.11	0.004	0.11	0.005	0.11	0.004	0.11	-0.003	0.11	-0.004
Subemployment	0.68	0.69	-0.029	0.68	-0.007	0.68	-0.029	0.68	-0.009	0.67	0.005	0.67	0.009
Unemployment	0.21	0.20	0.030	0.21	0.004	0.20	0.030	0.21	0.007	0.21	-0.003	0.22	-0.007

(*Continued*)

Table 3. Standardised Differences of Baseline Covariates

Variable	Treatment (Uses AUH)	5-NN (No Caliper)		10-NN (No Caliper)		5-NN (Caliper, .01)		10-NN (Caliper, .01)		Radius (Caliper, .01)		Radius (Caliper, .05)	
		Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.	Control (No AUH)	Stn. Diff.
Region (=1)													
City of Buenos Aires	0.02	0.02	0.009	0.02	0.001	0.02	0.009	0.02	0.001	0.02	-0.004	0.02	-0.006
Metro Buenos Aires	0.28	0.27	0.016	0.27	0.023	0.27	0.016	0.27	0.023	0.27	0.020	0.28	0.009
Other Metropolitan Areas	0.41	0.43	-0.030	0.43	-0.029	0.43	-0.030	0.43	-0.029	0.43	-0.026	0.43	-0.023
Rest of the Urban Interior	0.29	0.28	0.013	0.28	0.008	0.28	0.013	0.28	0.008	0.28	0.009	0.28	0.019
Survey Year (=1)													
2012	0.15	0.15	-0.011	0.15	-0.009	0.15	-0.011	0.15	-0.009	0.15	-0.001	0.15	-0.005
2013	0.13	0.13	0.010	0.13	0.013	0.13	0.010	0.13	0.013	0.13	0.018	0.13	0.016
2014	0.16	0.14	0.045	0.15	0.034	0.14	0.045	0.15	0.034	0.15	0.016	0.16	0.006
2015	0.16	0.17	-0.020	0.17	-0.019	0.17	-0.020	0.17	-0.018	0.17	-0.021	0.17	-0.019
2016	0.19	0.19	-0.006	0.19	0.004	0.19	-0.006	0.19	0.003	0.19	0.010	0.19	0.006
2017	0.21	0.22	-0.016	0.22	-0.020	0.22	-0.016	0.22	-0.021	0.22	-0.022	0.21	-0.005
Lives with Mother (=1)	0.97	0.97	0.003	0.97	0.004	0.97	0.003	0.97	0.004	0.97	0.007	0.97	0.009
Lives in Villa, Slum, or Settlement (=1)	0.17	0.14	0.058	0.15	0.038	0.15	0.058	0.15	0.040	0.16	0.026	0.16	0.025
Overcrowding in Rooms (=1)	0.30	0.30	0.007	0.30	0.008	0.30	0.008	0.30	0.006	0.30	-0.011	0.30	-0.010
Poor Housing Material	0.05	0.04	0.056	0.04	0.045	0.04	0.056	0.04	0.047	0.05	0.032	0.04	0.045
Extended Family in Home (=1)	0.39	0.40	-0.028	0.40	-0.032	0.40	-0.028	0.40	-0.034	0.41	-0.044	0.41	-0.042
Household Income Quintile	1.97	2.00	-0.021	1.99	-0.013	2.00	-0.021	1.99	-0.012	1.99	-0.014	2.00	-0.027

Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

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With respect to the two health outcomes on which the AUH is conditioned, vaccinations and medical exams, the programme appears to have no significant average treatment effect on the treated children. The rates of vaccination in the matched treatment and control groups are very high and similar to each other, between 98 and 99 per cent for all matching methods. The ATET is less than a fraction of one percentage point (p.p.) and is not statistically significant in any matching specification.

Regarding medical exams, the rate of exams in the treatment and control groups was also similar: between 73 and 74 per cent had visited a doctor at least once during the previous year. While there was a 5.5 p.p. difference in the unmatched sample favouring the treatment group (see Table 1B), that difference disappears after matching treated and untreated individuals on their propensity to use the AUH. Here, too, the ATET remains under 1 p.p. and is not statistically significant in any matching specification.

This paper also looks at the effect of the AUH on rates of dental visits, a health-related outcome that is included as an exploration of the effect of a CCT programme on additional healthcare consumption. A similar proportion of the matched treatment and control groups—just over 50 per cent—visited the dentist in the past year. Under no matching specification was the ATET greater than a quarter of 1 p.p. in either direction, and in no case was the ATET statistically significant, indicating that the AUH did not affect the rate of dental visits for recipient children.

The final outcome, food security, does show a positive treatment effect on the treated. The ATET is between 2.26 p.p. and 2.52 p.p., depending on the matching algorithm used, significant at the 5 per cent level. Compared to a baseline measurement of 73 per cent of non-recipients enjoying food security, the matching procedure creates a counterfactual group in which only 67 per cent of non-recipients enjoys food security. The significant, positive ATET warrants deeper study. Table 4 summarises the heterogeneous treatment effects of the AUH on food security for certain sociodemographic characteristics. Table 5 relates the change in the probability of enjoying food security conditional on belonging to each of those subgroups.

Table 4 shows that the treatment effect for young children aged 3-6 is large, 4.3 p.p., significant at the 10 per cent level. Table 5 confirms that, when controlling for other covariates, the average change in predicted conditional probability that a child using the AUH enjoys food security differs between children 3-6 years old and other children by 2.8 p.p., favouring younger

children, significant at the 10 per cent level. Interestingly, the AUH does not appear to have a statistically significant treatment effect for children 7-17 years old.

Table 4 also shows that the treatment effect is large for children with less formally educated mothers, 5.6 p.p., significant at the 1 per cent level. Interestingly, among children with more formally educated mothers, AUH recipients enjoy food security at a rate 4.5 p.p. lower than non-recipients, significant at the 1 per cent level. This difference also bears out in the analysis of the average change in the conditional probability of food security summarised in Table 5. The average change in the probability that an AUH-recipient child enjoys food security increases (decreases) by over 9 p.p. if that child has a less (more) educated mother, controlling for other covariates.

Finally, it is interesting to note that although children who live with their mothers experience a heterogeneous treatment effect of roughly the same magnitude of the full treated sample—2.2 p.p. (Table 4) compared to 2.3 p.p. (Table 2)—there is no change in the average conditional probability of food security among AUH-recipients attributable to the presence of the mother in the home, controlling for other covariates (Table 5). That is, there is no statistically significant interaction effect between AUH use and the presence of the mother in the home.

Discussion

The Effects of the Health Conditionality: Outcomes for Vaccinations and Medical Exams

Due to the high rate of vaccination among children in Argentina, it makes sense that the AUH does not have an effect on vaccination rates. Previous research from other countries has shown that CCTs can have positive effects on vaccination rates (Cruz et al., 2017), specifically in low-income and rural areas (Robertson et al., 2013), among vulnerable populations (Carvalho et al., 2014), or in countries with vaccination rates lower than 90 per cent (Barham and Maluccio, 2009). In contrast, this paper considers a predominantly urban population and studies an intervention with national coverage in a country with high vaccination rates.

Table 4. Heterogeneous Treatment Effects in Matched Sample (10-NN w/ caliper)

Subgroup	Treatment (%)	Control (%)	Difference (p.p.)	Sig.†
Total	69.0	66.7	2.3	**
	(0.01)	(0.01)		
Age				
3-6 years old	68.8	64.6	4.3	*
	(0.01)	(0.02)		
7-12 years old	68.6	67.6	1.0	n/s
	(0.01)	(0.02)		
13-17 years old	69.9	68.0	1.8	n/s
	(0.01)	(0.01)		
Education of Mother or Guardian				
Up to Incomplete Secondary School	65.8	60.2	5.6	***
	(0.01)	(0.01)		
Complete Secondary School or More	75.6	80.1	-4.5	***
	(0.01)	(0.01)		
Employment of Head of Household				
Full Employment	80.1	76.5	3.6	n/s
	(0.01)	(0.02)		
Subemployment	69.9	67.9	2.0	n/s
	(0.01)	(0.01)		
Unemployment	60.6	57.8	2.9	n/s
	(0.01)	(0.02)		
Lives with Mother				
Yes	68.9	66.7	2.2	*
	(0.01)	(0.01)		
No	71.9	65.7	6.2	n/s
	(0.03)	(0.03)		

Significance levels: $p < .1$ * / $p < .05$ ** / $p < .01$ ***
† Adjusted Wald Test for significance
Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

Table 5. Interaction Effects in Matched Sample

Variable (Interaction w/ AUH)	Change in Conditional Probability (p.p.)ǂ
Total	--
Age	
3-6 years old	0.028*
	(0.01)
7-12 years old	-0.017
	(0.01)
13-17 years old	-0.011
	(0.02)
Education of Mother or Guardian	
Up to Incomplete Secondary School	0.094***
	(0.02)
Complete Secondary School or More	-0.094***
	(0.15)
Employment of Head of Household	
Full Employment	0.009
	(0.02)
Subemployment	-0.008
	(0.02)
Unemployment	0.003
	(0.02)
Lives with Mother	
Yes	-0.048
	(0.04)
No	0.048
	(0.04)

Significance levels: p < .1 * / p < .05 ** / p < .01 ***
ǂ Z-test for significance
Source: EDSA Bicentenario 2010-2016 and EDSA 2017.

Since 2010, the ODSA has been tracking the vaccination rate among children. As of 2010, nearly 98 per cent of children were up-do-date with their vaccinations (Tuñón and Poy, 2017). Universal healthcare, broad access to health services, and the requirement that children be vaccinated in order to enter public school explain, in part, the high vaccination rates in Argentina. Given the high historical rate of vaccinations, it is curious that this condition was included in the AUH. It could have been included to target a small group of recalcitrant individuals, to highlight the importance of the behaviour, or simply because other countries in the region included vaccination as a condition. Further research into this area would be illuminating regarding how CCT programmes are created. Regardless, the results of this paper suggest that CCT programmes may be ineffective in marginally increasing the vaccination rate in a country with already high rates of vaccination.

The lack of positive effects on the rate of medical exams is less expected. Unlike with vaccinations, a much larger proportion of the population ought to be exposed to the incentives of the AUH programme to attend medical exams: vaccination rates among the matched treatment and control groups range from 98 to 99 per cent, whereas the rates of medical exams range from 73 to 74 per cent. That is, a quarter of the children in the matched treatment group that were exposed to the incentives of the AUH did not receive a medical exam.

Previous research has found that CCT programmes have been successful in increasing healthcare utilisation; however, much of this research has focused on early childhood (Attanasio et al., 2005a; Akresh et al., 2012; Brenzel et al., 2007; Barham and Maluccio, 2009; Perova, et al., 2012). This paper studies children between the ages of three and 17. A possible explanation, then, is that CCT programmes are less effective in increasing healthcare utilisation among older children. However, Gertler (2000) finds that Mexico's CCT programme *PROGRESA*, which includes a condition that older children attend annual medical exams, does increase healthcare utilisation among children aged 6-17. Further, though unrelated to health outcomes, De Brauw et al. (2014) find that educational outcomes can be stronger among older children. Another possibility is that several aspects of programme design may have affected the efficacy of the AUH. What follows is a thorough examination of potential issues with the incentive scheme of the AUH, which may have contributed to the lack of positive findings.

One potential issue involves weak enforcement of the health conditions. The Argentine government recently requested a loan from the World Bank for $600 million in order to expand AUH coverage, increase the transparency of the programme, and strengthen the management of the programme by ANSES and the Ministry of Social Development[7]. The loan agreement identifies a number of issues with enforcement. One challenge is that the ANSES enforcement mechanism is not directly linked to the health and education ministries; rather, it is mediated through the programme booklet. Increased interagency collaboration might improve programme enforcement. Another challenge identified by the loan agreement is that ANSES does not publish internal monitoring reports. The loan agreement establishes targets for the number of internal monitoring reports ANSES ought to publish each year. These reports may serve as a positive feedback mechanism to improve enforcement of the health conditionalities. Providing context on the importance of enforcement, Baird et al. (2014), in a systematic review of the effects of conditional and unconditional cash transfer programmes on school enrolment, observe that conditional programmes outperform unconditional programmes when they monitor compliance, penalise non-compliance, and are explicitly conditional.

Another salient issue could be limited healthcare access for the AUH-eligible population, which would be a more fundamental issue than a weak enforcement regime. Over half of children and adolescents in Argentina rely on the public health system as their only healthcare option, which means that providing quality universal care is a great responsibility for the state (Tuñón, 2016). Children in low-income households are more likely to rely on the public healthcare system and less likely to use the health system in general, in part due to issues regarding access, coverage, and quality of care (Peters et al., 2008). Maurizio et al. (2014) explain that limited healthcare access has affected the programme in the past: due to the undersupply of vaccination centres or the inability for parent beneficiaries to schedule medical appointments, enforcement during the first few years of the AUH was purposefully lax. It would be inappropriate to condition social assistance on engagement with a system that may be strained to satisfy its demand, but limited access to healthcare would explain the results provided by the present evaluation.

7 Public disclosure from the World Bank, accessed June 8, 2018: http://documents.worldbank.org/curated/en/233791467813473643/pdf/PAD1853-PAD-P158791-Box396267B-OUO-9-R2016-0114-1.pdf

An argument against the scarcity of healthcare access can be mounted with respect to the reported success of the *Plan Nacer / Programa SUMAR* initiative. These programmes instituted a pay for performance model that incentivised healthcare providers to amplify access to their services. Cortez (2013) finds that *Plan Nacer* improved health outcomes for both programme participants as well as other users of the clinics that were not enrolled in the programme. This latter finding suggests that either the quality of service in the hospital was improved or access to the hospital was amplified, or both. The Ministry of Health (2013) also reports that their collaboration with ANSES led to more AUH recipients enrolling in government healthcare plans, which could increase the rate with which these individuals receive medical exams. Despite the reported success of these programmes and their operational interconnectivity with the AUH, the evaluation presented in this paper runs against the narrative that AUH-recipient children are consuming more healthcare. This contradicting evidence suggests that further research should be conducted into healthcare access for the population of individuals eligible for the AUH.

Finally, as detailed previously, the multiple legislative changes to the health conditionalities and the ambiguity with which they are presented in official literature may contribute to the lack of positive results for vaccinations and medical exams. There have been other changes to the AUH that can be considered for reference. For example, the AUH originally stipulated that children attending private schools were ineligible for the benefit—indeed, the official form detailing AUH eligibility, *PS 1.47*, still contains this provision. However, as a result of pressure from the *Defensor del Pueblo Nacional*, ANSES extended AUH eligibility to children attending private schools that receive state tuition subsidies (DPN, 2011). Rabinovich et al. (2015) nevertheless find that some parents still believe that their children do not qualify for the AUH because they attend private schools. An individual's original understanding of how a social programme functions can be sticky, so the many changes to the health conditionalities may reduce their effectiveness.

Other Health-Related Outcomes: Dental Visits and Food Security

The results from this evaluation show that the AUH did not affect the rate of dental visits among programme-recipient children. Perhaps it is unsurprising that dental healthcare consumption did not increase, given that the AUH also failed to increase the rate of visits to the doctor. Among the various

mechanisms to increase the rate of dental visits, encouragement from a physician is a compelling one. A compounding problem could be the lack of access to oral healthcare facilities. Regardless, the AUH did not aim to change behaviours around oral health, so it is not surprising that the programme did not affect this outcome. Unfortunately, there is limited available data to investigate the effect of the AUH on consumption of other forms of healthcare. But as ANSES, the Ministry of Social Development, and the Ministry of Health continue to advance interagency collaboration, this is a line of research that the government may be interested in pursuing.

The positive average treatment effect on the treated for food security confirms previous research on this subject for the Argentine case (Salvia et al., 2015). Where previous research identified positive treatment effects from 2010 to 2012, this analysis extends those findings through 2017. The subsequent analysis of heterogeneous treatment effects and interaction effects between AUH use and population subgroups opened a number of interesting discussions. Chief among them is the nature of the interaction between AUH use and the presence of the mother in the household, particularly because ANSES prioritises making AUH payments to mothers. The results in Table 5 above show that, controlling for other factors, the AUH is no more effective for children living with their mothers than for children in households where the mother is not present. This finding supports previous research, such as Haushofer and Shapiro (2013), which finds that varying the gender of the main recipient of a cash transfer in Kenya does not change the effects of the transfer on household consumption. While there appears to be no short-term benefit of gender-targeting the cash transfer, there may be long-term harm. Some academics posit that prioritizing payments to mothers reinforces social norms of mothers as caretakers and therefore limits their social, economic, and political fortunes, as well as the fortunes of their daughters (Molyneux, 2006; Pautassi, 2014). In the same way as the AUH is interested in breaking the intergenerational cycle of poverty, it is also worth considering the intergenerational effects of conditioning women to be the primary caretakers of children.

The effect of the AUH on food security is larger for children of less formally educated mothers and for younger children. This latter point is encouraging, as young children are particularly affected by dietary reductions. These results support the consensus behind the importance of interventions during early childhood. Interestingly, the same effects are not present for older chil-

dren, and it may be worth considering how to restructure the AUH so that benefits to food security continue throughout childhood. Regarding the heterogeneous effects from the mother's education level, there are antecedents in the literature that CCT programmes have greater treatment effects for children with less formally educated mothers. Barham et al. (2007) and Barham and Maluccio (2009) find that increases in the vaccination rate attributable to CCT programmes in Mexico and Nicaragua were greater for the children of less formally educated mothers. Additionally, Fernald et al. (2009) find that the effect of *Oportunidades* on the height-for-age of children beneficiaries was greater when the mother lacked formal education. The height-for-age outcome is a product of adequate nutrition and caloric consumption, which follow in part from the state of food security evaluated in this paper. These findings point to the heightened effect of CCT programmes on some of the most vulnerable population subgroups: young children, and children of less formally educated mothers.

Conclusion

This study aimed to determine the effect of Argentina's conditional cash transfer programme, the AUH, on certain health outcomes of children beneficiaries. Of particular interest were the health outcomes on which the AUH is conditioned: vaccinations and medical exams. Other health-related outcomes were evaluated as well, namely dental visits—an exploration of whether additional healthcare consumption stems from AUH use—and food security. A quasi-experiment was conducted in which AUH-recipient children were matched with otherwise similar children who do not use the programme. Multiple matching methods were utilised. The evaluation provided estimates for the average treatment effect on the treated (ATET).

Overall, the AUH does not appear to affect the rate of vaccinations, medical visits, or dental visits for children who receive the conditional cash transfer. The AUH did improve the rate of food security, by between 2 and 3 p.p., and the risk of food insecurity was particularly reduced for vulnerable populations: young children and children of mothers with less formal education.

It is likely that the AUH had no effect on the vaccination rate because routine vaccinations were already so regular in Argentina before the

implementation of the programme. It is more difficult to determine why the AUH had no effect on children attending regular medical exams, particularly given the success of similar programmes in other countries. One explanation is that while we find that the AUH is not effective among the age cohort studied in this paper—children aged three to 17—it may be effective among younger children. Further research can consider this possibility, and if it is true, then changes to the programme should be considered in order to more effectively increase healthcare utilisation among this older cohort. Another explanation is that the design, implementation, and enforcement of the health conditions were flawed in important ways: the conditions themselves changed multiple times, the ages to which they corresponded changed, the language detailing the conditions is vague, and enforcement of the conditions is inconsistent. Another possible explanation is that access to healthcare is limited, particularly for children who rely on public sector health services.

It is important to consider these possible explanations, because problems with the programme conditionality can affect beneficiary families. Failure to demonstrate compliance with AUH conditions results in suspension from the programme and forfeiture of the accumulated annual payment. Straschnoy (2017) reports that between 2013 and 2015, around 20 per cent of children were suspended from the AUH each year. The lack of positive findings for the health outcomes on which the AUH is conditioned should trigger reflection on the institutional capacity for programme enforcement and access to healthcare. The agencies running the AUH have identified areas of operational improvement and solicited a loan to realise these improvements. In the meantime, if the AUH contains conditions that the state is not able to enforce or that the state does not have the capacity to service, the 20 percent penalty is unjustified.

This research is an important first step to understanding the effects of Argentina's conditional cash transfer programme on health-related outcomes. More broadly, this research contributes to the literature on conditional cash transfer programmes, an increasingly prevalent poverty reduction strategy that depends on increasing the human capital of children beneficiaries through investments in education and health.

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