Unpacking Healthcare Insurance and Financing Mechanisms: Impacts on Pregnancy and Birth Outcomes

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Abstract

We analyzed the effect of changes in health care provider reimbursement mechanisms on pregnancy outcomes. In 2014, the Colombian government implemented a policy that eased the requirements for young adults to keep their health coverage after turning 18. Given the mandatory nature of prenatal care and delivery provision in the country, being insured or not does not affect the admission of pregnant women, but it does impact billing processes for health providers as the responsible payment entity changes. Our study exploits the temporal variation and policy-induced discontinuity by employing a differences-in-discontinuities design. We found that the policy decreased the non-affiliation rate by almost 20%. However, our results indicate that non-affiliation (or, equivalently, health service providers billing the state instead of insurers) is associated with a 44 percentage point decrease in the occurrence of preterm births, as well as a reduction in the likelihood of low birth weight and height.

Keywords: Insurance; pregnancy; health providers; healthcare billing; difference-in-discontinuities.

1 Introduction

The provision of maternity care and delivery can be influenced by physicians' and hospitals' financial incentives. This behavior can be understood through the theories of moral hazard within healthcare systems. Essentially, the information asymmetry, stemming from the patient's unfamiliarity with suitable treatments and the high costs incurred by insurers in auditing healthcare, gives physicians significant influence over the quality and extent of services offered (Smith et al., 1997). This situation can lead to imperfect agency relationships when financial incentives are in play. A particular scenario that has been extensively analyzed in the literature is the treatment of pregnancies and deliveries, and how financing mechanisms and economic incentives can impact outcomes such as infant and maternal mortality (Bowser et al., 2016), postpartum depression and stress (Guldi and Hamersma, 2023), preferences for c-sections (de Elejalde and Giolito, 2019; Foo et al., 2017), among many others.

A Colombian policy give us a great scenario for studying this topic. In Colombia, the national healthcare system, designed on the principle of universality, offers two distinct alternatives for insurance coverage: the Contributory Regime for workers and their families, and the Subsidized Regime for the poorest population. Given the division of roles between health insurance and service provision, the flow of resources becomes intricate, compounded by a complex network of contracts to remunerate healthcare providers, which is contingent upon the source of insurance. In 2014, the national government aimed to increase the system's coverage by relaxing the requirements for young adults to keep their status as dependent beneficiaries after reaching the age of majority (18 years). Before this policy was implemented, young adults became uninsured after turning 18 in case they weren't full time students. The policy allowed these individuals to maintain coverage until the age of 25 or until they became employed.

In this paper, we study how changes in health care provider reimbursement mechanisms might affect health outcomes, more specifically, pregnancy and birth outcomes. For this, we use the aforementioned policy as an exogenous source of variation in health insurance. It must be understood that in Colombia, health service providers, whether private or public, cannot refuse to provide essential services such as perinatal and maternal care (especially considering that pregnant women and infants are constitutionally protected groups). The insurance status of pregnant women does not define the viability of being admitted to a hospital, but it does guide the administrative procedures that service providers follow. Basically, if a woman is covered by the healthcare system, the service is billed to the relevant insurance company. In contrast, if she is uninsured, the charge is directed to the territorial entity (municipality). Financial implications resulting from either type of reimbursement could influence the decisions made before, during, and after the procedure, potentially impacting pregnancy outcomes.

We employed the differences-in-discontinuities design proposed by Grembi et al. (2016). Given the described context and the assignment rule of the policy change, we have two types of variation that we can exploit: a time variation (in our case, before and after June 2014 when the policy was implemented) and a discontinuity in age (below and above 18 years, where there is a drop in the affiliation rate). By identifying these variations, we can not only calculate the causal effect of the policy on enrollment and health outcomes but also use it as an instrument to address our main question.

Our research is based on vital statistics data that encompass the universe of births in Colombia. This database is published by the National Department of Statistics and contains birth-level information derived from live birth records. It provides essential data about the newborn (including weight, height, gestational age, Apgar test scores, and type of delivery). Additionally, we also have basic information about the mother. Of particular interest to us are the mother's age at the time of delivery and her affiliation status within the healthcare system. To precisely measure the influence of policy adjustments, we restricted our sample to births that occurred between July 2011 and June 2017 (three years prior to and following the policy implementation).

We found that that the policy significantly decreased health uninsurance by approximately 19% compared to 18-year-old women in the pre-treatment period. Additionally, non-affiliation with the health system was linked to a substantial 44 percentage points reduction in preterm births, accompanied by a 32 pp decrease in low birth weight and a 28 pp reduction in short length. Effects on prenatal visits and delivery types lacked consistency and statistical significance across various model specifications, making it challenging to identify a definitive causal pathway for explaining the results.

Our paper is framed within the literature that explores the causal effect of health insurance on medical care utilization and health outcomes. Concerning maternal and child care, a case extensively studied has been the Medicaid eligibility extension for pregnant women during the 1980s in the United States. Although mixed effects have been found, several studies estimated increases in prenatal care (Currie and Gruber, 1996; Long and Marquis, 1998). Also, despite Ray et al. (1997) not finding a reduction in premature births with increased affiliation, and Epstein and Newhouse (1998) reporting inconsistent effects on various health outcomes, a recent study by Guldi and Hamersma (2023), using follow-up data, determined that while the effects on birth outcomes were indeed modest, longer-term impacts on both maternal and child outcomes were observable.

In Colombia, the expansion of the subsidized regime following its establishment with Law 100 of 1993 provided a window for several studies to measure the impact of affiliation (Trujillo et al., 2005; Miller et al., 2013; Atehortúa and Palacio-Mejía, 2014). Focusing on the health outcomes we are interested in, Gaviria and Palau (2006) employed an instrumental variable approach and concluded that affiliation with the Subsidized Regime had a positive but modest effect on birth weight, particularly evident in the poorest households. Conversely, Giedion et al. (2009a), utilizing propensity score matching, found that affiliated women exhibit a slightly higher likelihood of delivering in a healthcare facility and receiving assistance from a doctor or other skilled personnel. Nevertheless, this effect was less pronounced in rural areas.

This study is also related to the literature that examines the effects of contracts in the health sector on health outcomes. For example, Kosecoff et al. (1990) and Grabowski et al. (2011) examine the effect of the introduction of prospective payment in Medicare on hospitals and nursing facilities. In Colombia, Carranza et al. (2015) assess the impact of capitation and event-based contracts, finding that the former is associated with lower rates of emergency room returns and lower relapse rates.

We expect to contribute to the literature in two ways. First, it analyzes the effects on healthcare coverage and pregnancy outcomes of a policy that relaxed the requirements for remaining in the Colombian healthcare system as a dependent beneficiary after reaching the age of majority. Second, it also provides an opportunity to study whether healthcare service providers can behave differently in response to changes in administrative procedures related to reimbursements. The findings deepen to the understanding of the complex interplay between policy interventions, healthcare access, and reproductive health outcomes in Colombia.

This paper continues as follows: Section 2 provides the context and describes the structure of the healthcare system in Colombia, along with changes in regulations regarding dependent children health coverage. Section 3 presents the data used and some descriptive statistics and Section 4 introduces the empirical strategy. The results are shown in Section 5, and finally, Section 6 concludes.

2 Institutional setting

The Colombian General System of Social Security in Health (SGSSS, for its initials in Spanish), regulated by Law 100 of 1993, operates under a managed competition compulsory insurance system. Insurers, known as Health Promoting Entities (EPS), compete for affiliates on the basis of quality as the health benefit plan (PBS) they provide is standard, as well as the premiums, co-payments and insurance rules. The EPS are responsible for enrolling individuals, collecting contributions from them, and providing the PBS through contracts with a network of Healthcare Provider Institutions (IPS), whether public or private.

The system is divided into two regimes: the Subsidized Regime (RS) and the Contributory Regime (RC). This distinction is essential, as for a large proportion of affiliates the premium is subsidiazed after showing the lack of a formal source of income; the rest, either contribute via a payroll tax or are registered beneficiaries of someone who pays such contributions. This design aims to reduce inequality, segregation, and ensure universal health care (Londoño and Frenk, 1997). For a comprehensive overview of the actors, functions, and operation of the system, please refer to Appendix A.

2.1 Beneficiary status after age 18

The Contributory Regime includes contributors and their immediate family members: spouses or permanent partners, and children. Originally, the law stipulated that dependent children would receive benefits until the age of 18. Later, they could remain affiliated as beneficiaries until the age of 25, provided that they were financially dependent on their parents and enrolled as full-time students. For that purpose, EPS could request certificates of enrollment from them to confirm their student status. However, starting in 2013, EPS were required to confirm student status using a database administrated by the Ministry of Education, which obtained information from Higher Education Institutions[1]. Hence, the responsibility to verify this information fell on the EPS, with the beneficiary only required to prove their eligibility in cases where inconsistencies arose

[1] See Decreto 19 de 2012 and Decreto 2685 de 2012.

with the database[2].

On June 25, 2014, the enactment of Decree 1164 marked the start of a 12-month transition period during which EPS were required to maintain the affiliation status of dependents aged 18 to 25, provided they were not employed or self-employed individuals capable of making their own contributions. A year later, this directive was formalized in Law 1753 of 2015, effectively altering the requirements outlined in Law 100 for beneficiary-children between the ages of 18 and 25. Essentially, the sole criterion established was financial dependence, which would be presumed (without the need for proof) as long as the beneficiaries were not making direct contributions to the system.

Concerning the criteria for maintaining beneficiary-child status after reaching adulthood, the regulatory changes mentioned above marked two distinct periods: before and after June 2014. After this date, the requirement of full-time student status was no longer necessary. This measure was implemented with the aim of rectifying disparities in the healthcare system and ensuring the right to health for nearly three hundred thousand economically dependent young individuals[3]. With this policy, they could pursue further education or assist their families without worrying about lacking health coverage.

2.2 Billing and charging processes within Healthcare Service Providers

Contracts between insurers and IPS are regulated by law and only three specified mechanisms are allowed for the purchase of health services: capitation payment, event-based payment, and case-based payment[4]. Under capitation payment, the IPS receives a fixed payment in advance for a group of individuals, ensuring them the provision of a set of services over a specified period of time. In contrast, when the contract is event-based, the IPS charge the payer after the delivery of a service, whether it's a procedure, intervention, or the supply of a medication. Case-based payment is similar to the latter, with the difference that payments are made for a package of services provided to a patient

[2] See Decreto 916 de 2013.
[3] See Boletín de Prensa No 182 de 2014.
[4] See Decreto 4747 de 2007.

that are linked to an initial diagnosis. In any of the three cases, prices are established in advance.

Healthcare providers and insurers use the SOAT tariff manual as a reference to establish prices for services and procedures. This manual is updated annually and classifies procedures based on the Unified Classification of Health Procedures (CUPS). For instance, in the context of our research, the cost for a vaginal delivery package in 2011, whether spontaneous or instrumented, was set at 1,082,400 COP, while the cost for a cesarean section package amounted to 1,769,400 COP[5]. Importantly, these values include pre-surgical and pre-anesthesia consultations, complementary exams, the intervention itself, hospitalization expenses, as well as post-intervention check-ups and medications.

In practice, when users go to the emergency services of any IPS in the country, they are first evaluated by the TRIAGE system (patients are classified and attended according to the severity or risk of their symptoms). Once this initial assistance is provided, users' rights are verified. In other words, the institution responsible for the payment of services is identified in a database that the insurers must keep updated for this purpose. The IPS must inform the corresponding EPS insurer about the patient's admission to the emergency department. Additionally, they must seek authorization for subsequent services after the initial care when required. If the IPS is within the insurer's network of healthcare service providers, these subsequent services will also be provided by them.

If after the verification of rights it is found that the person is not affiliated to the SGSSS, he/she will be treated as a Non-Affiliated Poor Population (PPNA) at the expense of the territorial entity. However, a small share of the costs will be assumed by the user. This is known as Recovery Fees; payments that individuals not affiliated with the RC or RS must make to healthcare providers when in need of medical attention. It corresponds to 5% of the service value for individuals in level 1 of SISBEN or included in census listings; and 10% for those in level 2. These percentages should never exceed the equivalent of 1 or 2 times the Minimum Monthly Legal Wage (SMMLV) respectively. Individuals with higher levels or those not registered in SISBEN, who would typically be

[5]See Manual Tarifario SOAT 2011.

considered capable of paying, can undergo a case review at the social work office. They may access the option of paying up to 30% of the costs (without exceeding 3 SMMLV)[6].

Once the service is provided, IPS must send the bills and accompanying documents to the responsible payment entity (EPS in case the user is insured within the RC or RS, or territorial entity otherwise), adhering to the payment mechanism guidelines specified by the Ministry of Social Protection[7]. When the entity responsible for payment receives the bill, it must make the payment within an established period of time so the IPS can enjoy liquidity for the payment of its own obligations and the improvement of its services.

Delays in payment and the accumulation of debts have become common within the SGSSS, posing significant risks to the system's financial stability and overall operation. On one hand, the nation has accumulated substantial debts with EPS due to the payment of UPC (Upegui, 2020). On the other hand, it has been identified that both EPS and local authorities delay payments to IPS in order to generate financial returns and enhance their overall financial standing[8]. Consequently, healthcare service providers (IPS), positioned at the end of the payment chain, find themselves compelled to resort to loans, incurring additional costs due to interest rates (Prada, 2004).

[6]See Decreto 2357 de 1995 and Decreto 780 de 2016.

[7]See Decreto 4747 de 2007 and Decreto 3047 de 2008.

[8]It has also been documented that delays in accounts payable to IPS stem from inefficiencies in billing processes in hospitals (mainly in public ones), leading to the rejection of invoices by EPS (López et al., 2006).

3 Data

For this study, we used the Vital Statistics database (EEVV) containing the universe of births in Colombia. This database is a collaborative effort between the Ministry of Health and Social Protection (MSPS) and the National Administrative Department of Statistics (DANE) aimed at understanding the evolution and dynamic characteristics of the population. This dataset is derived from certificates of live births filled out by healthcare professionals who attended the childbirth in healthcare institutions[9] [10]. The unit of observation within these records is the live birth, offering a wealth of information about the birth event itself, the newborn, the parents, and the certifying authority.

Starting with the reference periods from 2011 to 2017, we first narrowed down the dataset to births occurring between July 2011 and June 2017 (covering a 6-year period, with 3 years before and 3 years after the policy implementation). Additionally, we considered only births in which the mother's age ranged from 15 to 20 years, resulting in 1,106,587 births. Next, filtering out observations with missing values in the variables of interest and focusing solely on births attended in healthcare institutions[11]—aligned with the scope of our paper, which aims to analyze their potential behavior—we reduced our sample to 1,089,000 observations.

For mothers, we have their *age* in completed years[12] [13] and an indicator of marital

[9]The final database is consolidated by combining certificates filled out online and those completed in physical form. The latter are sent to the municipal and departmental health offices and eventually reach the regional offices of the DANE. There, the documents undergo a digitization process before the information is sent to the central offices on a monthly basis.

[10]In cases where the delivery occurred outside of these facilities, notaries are responsible for filling out the certificates at the time of birth registration.

[11]Indeed, 55% of births with missing values in the variables of interest took place outside healthcare institutions. Consequently, the birth certificate lacked essential information for our analysis. The percentage of missing values remains quite consistent across mother's ages, ranging between 1.35% and 1.46% (see Figure B1).

[12]In the parental data section of the live birth certificate, the inquiry is solely about the age of the mother at the time of birth, expressed in completed years. As a result, the age is captured as a whole number, omitting the fractional component that could have been calculated if the certificate had included the mother's date of birth.

[13]We tried to increase the variability of our running variable by matching mothers with their records in the Single Database of Affiliates (BDUA) and obtaining their date of birth. With the birth date of the mother and her child, we were able to calculate the exact age of the mother at delivery, thus moving from a discrete to a quasi-continuous variable. However, the matching of these databases was not without loss since the vast majority of observations of women under 18 years of age failed to be matched, especially during the first years of our study. Within the limits of our knowledge, we could not identify mothers who were minors at the time of birth and who changed their identification number after reaching the age

status, denoting whether they are *married*. Their educational level is captured by the variables *Primary education*, *Secondary education*, and *High school*, which take the value of 1 if the mother's completed highest educational level falls within the respective category. One of our primary variables of interest is *Non-affiliate*, indicating whether the mother lacks coverage in the SGSSS. Otherwise, it specifies whether she belongs to the *Contributory Regime* or the *Subsidized Regime*.

Concerning variables related to pregnancy and delivery, we collect data on the number of *prenatal visits* and the *gestation period* in weeks. Additionally, we incorporate dummy variables indicating the mode of delivery, whether it was vaginal (either *spontaneous* or *instrumental*) or by *C-section*. Regarding newborn outcomes, we capture the birth *weight* in grams and the *length* in centimeters. Moreover, we include *Apgar 1* and *Apgar 5*, representing scores from a swift assessment conducted on newborns at 1 and 5 minutes after birth[14].

Given that small changes in these variables may not inherently be considered as positive or negative, we have derived five dummy variables based on the definitions provided by the World Health Organization (WHO): *Low Weight*, coded as 1 for birth weights below 2,500 grams; *Short length*, applicable to lengths below two standard deviations from the mean (in our sample 43.68 cm); *Low Apgar 1* and *Low Apgar 5*, identifying scores below 7 in the respective test[15]; and *Preterm*, indicating births occurring before the 27th week of gestation. For a detailed overview of these variables, please refer to Table B1.

As our study relies on two crucial variables for identifying the treatment status—namely, the age of the mother at the time of delivery and the birth date (captured in our database by month and year), we illustrate the distributions of these variables in Figures B1 and B2. Additionally, Table 1 provides detailed descriptive statistics, segmenting our sample based on this dual stratification. For the pre-treatment period, there are 570,830 obser-

of majority, but only those who were born under the Unique Personal Identity Number (NUIP) regime, which would identify each citizen throughout all her life.

[14]These assessments assign a score from 0 to 2 in the following categories: heart rate, reflexes, respiratory effort, skin color, and muscle tone. Consequently, the final score ranges from 0 to 10, with higher scores indicating better overall health and vitality.

[15]A score below 7 does not necessarily imply illness in the baby but suggests that immediate medical assistance or intervention might be needed for adaptation.

vations, and 41.2% correspond to women aged between 15 and 17. In the post-treatment period, there are 518,170 observations, and 35.5% are from mothers aged 15 to 17. Marriage is infrequent within our study, with only 1.3% of mothers below 18 and 4.5% above 18 being married for the pre-treatment period. In terms of education, as expected, a more educated population is observed among the older age group; 51.6% completed high school, compared to 24.5% of younger mothers.

Simultaneously, the data reveals an increase in the proportion of non-affiliated individuals, escalating from 6.1% among women aged 15 to 17 to 8.2% among those aged 18 to 20. In the post-treatment period, despite lower non-affiliation rates, there is still an uptick from 2.6% for mothers aged 15 to 17 to 3.4% after reaching the age of 18. Refer to Figure B3 for a more nuanced depiction of affiliation rates over the study years.

Pregnancy outcomes are pretty similar across the two groups. For births with mothers aged 18 to 20 years in the pre-treatment (post-treatment) period, the average gestation period is 38.5 (38.4) weeks, the mean birth weight is 3,081 (3,073.4) grams, and the average length is 49.5 (49.6) cm. The proportion of preterm births is 8.8% (9.2%), while 9.0% (9.2%) of newborns have low birth weight and about 3% (2.9%) of infants exhibit a short length. Apgar scores at 1 minute have a mean of 8.187 (8.173), and at 5 minutes, the mean score is 9.522(9.486).

Table 1: Descriptive Statistics

	Pre-Treatment				Post-Treatment			
	Age 15-17		Age 18-20		Age 15-17		Age 18-20	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mother-related:								
Mother's age	16.3	0.760	19.0	0.811	16.3	0.767	19.1	0.808
D(Married)	0.013	0.114	0.045	0.208	0.011	0.103	0.039	0.193
D(Primary education)	0.207	0.405	0.140	0.347	0.201	0.401	0.114	0.318
D(Secondary education)	0.538	0.499	0.335	0.472	0.543	0.498	0.321	0.467
D(High school)	0.245	0.430	0.516	0.500	0.247	0.431	0.557	0.497
D(Contributory Regime)	0.233	0.422	0.255	0.436	0.224	0.417	0.283	0.450
D(Subsidized Regime)	0.693	0.461	0.648	0.478	0.739	0.439	0.670	0.470
D(Non-affiliate)	0.061	0.240	0.082	0.275	0.026	0.160	0.034	0.182
Pregnancy and delivery-related:								
Prenatal visits	5.540	2.429	5.723	2.428	5.701	2.458	5.932	2.463
Gestation period	38.366	1.953	38.461	1.867	38.322	1.930	38.393	1.880
D(Preterm)	0.100	0.301	0.088	0.284	0.102	0.303	0.092	0.289
D(C-section)	0.384	0.486	0.389	0.487	0.394	0.489	0.402	0.490
D(Spontaneous)	0.604	0.489	0.600	0.490	0.596	0.491	0.587	0.492
D(Instrumental)	0.012	0.107	0.011	0.106	0.010	0.100	0.011	0.103
Newborn-related:								
D(Female)	0.485	0.500	0.486	0.500	0.483	0.500	0.486	0.500
Weight (g)	3,040.1	490.6	3,081.0	494.7	3,038.7	487.0	3,073.4	493.7
Length (cm)	49.366	2.937	49.535	2.891	49.455	2.905	49.581	2.911
Apgar 1	8.160	0.965	8.187	0.935	8.150	0.946	8.173	0.916
Apgar 5	9.510	0.804	9.522	0.783	9.477	0.792	9.486	0.775
D(Low weight)	0.100	0.300	0.090	0.286	0.100	0.300	0.092	0.289
D(Short length)	0.034	0.181	0.030	0.171	0.031	0.174	0.029	0.169
D(Low Apgar 1)	0.043	0.203	0.038	0.190	0.040	0.197	0.036	0.186
D(Low Apgar 5)	0.010	0.101	0.009	0.096	0.009	0.094	0.008	0.090
Observations	210,222		360,608		183,680		334,490	

Note: The birth statistics are stratified along to two dimensions: whether they occurred in the pre-treatment period (July 2011 to June 2014) or the post-treatment period (July 2014 to July 2017); and secondly, based on the age of mothers at the time of childbirth, distinguishing between those aged 15 to 17 years and those aged 18 to 20 years. Dummy variables are denoted in the format D(x).

4 Empirical strategy

We rely on the difference-in-discontinuities (diff-in-disc) quasi-experimental design proposed by Grembi et al. (2016) to identify the causal effect of changes in the reimbursement mechanisms of healthcare providers (due to the affiliation status of their users) on pregnancy outcomes. For this, we are using a policy change happening in June 2014 that eased eligibility rules for young adults to maintain their healthcare coverage after turning 18. Hence, there are two sources of variation we can exploit: a time variation (before and after June 2014) and a discontinuity variation (below and above 18 years). Since the assignment rule of this policy does not define exactly the affiliation status of young adults, but it changes the probability of losing insurance after the age of 18, we use the policy as a instrument for affiliation status.

Let Age_{it} be the mother's age at the time t of the delivery i, and c the known threshold at age 18. Besides, let T_0 represent the moment when the policy came into effect in July 2014[16]. Putting it all together, only births occurring at $t \geq T_0$ for mothers such that $Age_{it} \geq c$ fall under the treatment assignment of our policy. The causal effects of the policy on either non-affiliation (first-stage) or pregnancy outcomes (reduced-form) are estimated on the difference between the post-treatment and pre-treatment discontinuities occurring at age 18. Using the difference-in-discontinuities design, we can clean the estimator of jumps that may be due to other characteristics changing at 18 years old (See Figure 1).

Restricting our sample to a maximum of three years before and after the treatment (from July 2011 to June 2017) and using three different bandwidths of 1, 2, and 3 years[17] around the threshold age of 18, we use a two-stage least squares model (2sls), whose

[16] Although the policy was introduced in June 2014 with immediate effect, since it was in the last days of the month, June is considered part of the pre-treatment period.

[17] In the particular case in which the bandwidth is set to 1, there is only one mass point on each side of the 18-year threshold, therefore the estimated equation is reduced to: $Y_{it} = \alpha_0 + \beta_0 Treated_i + \gamma_0 Post_t + \delta_0 Treated_i \times Post_t + \phi_t + \varepsilon_{it}$.

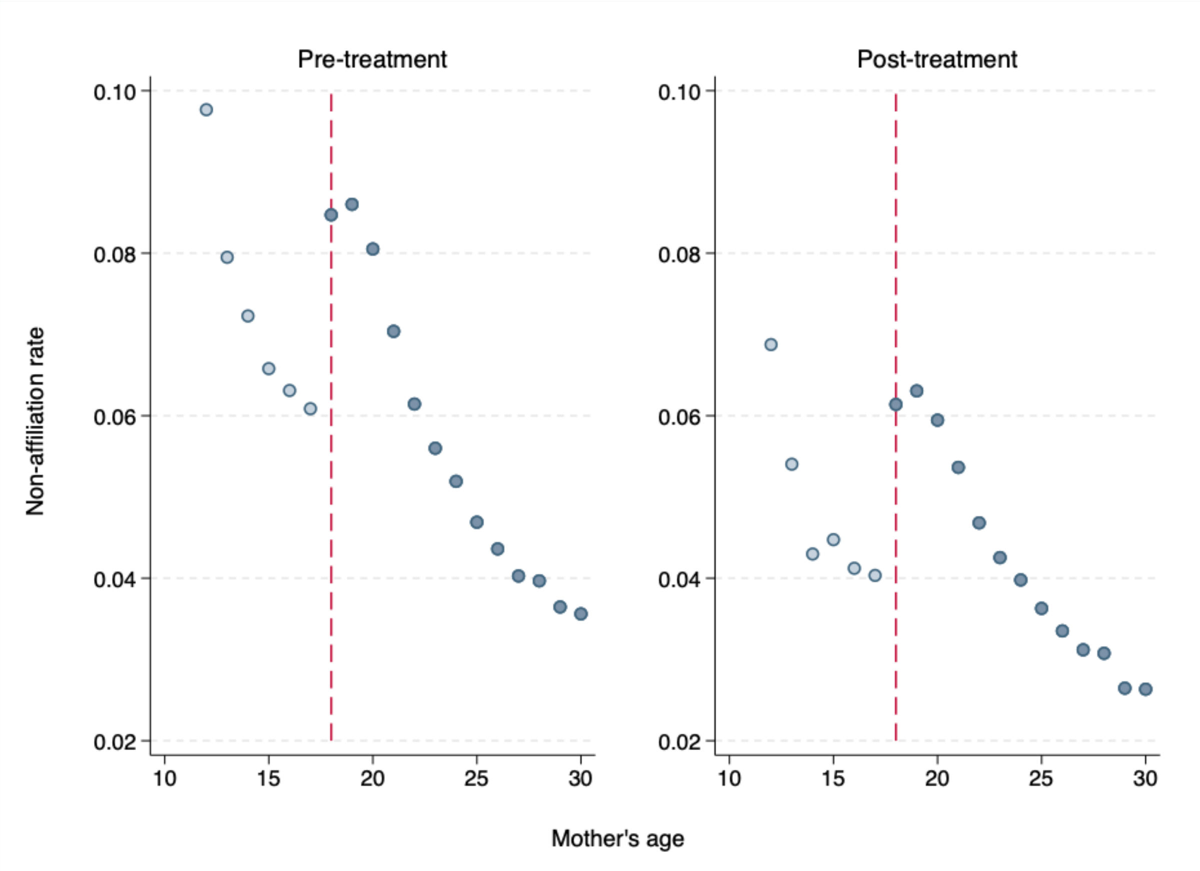
reduced form regression is given by:

$$Y_{it} = \alpha_0 + \alpha_1 Age^*_{it} + (\beta_0 + \beta_1 Age^*_{it})\, Treated_i \\ + (\gamma_0 + \gamma_1 Age^*_{it})\, Post_t + (\delta_0 + \delta_1 Age^*_{it})\, Treated_i \times Post_t + \phi_t + \varepsilon_{it} \quad (1)$$

Where Y_{it} is the outcome of interest, either pregnancy-, delivery- or newborn-related outcomes. Age^*_i represents the mother's age at the time of delivery centered at the threshold: $Age^*_i = Age_i - 18$. $Treated_i$ is an indicator for births in which the mother was 18 years or older: $Treated_i = \mathbb{1}(Age_i \geq 18)$; the same way that $Post_i$ serves as an indicator for the post-treatment period, meaning it takes the value of 1 for births occurring after June 2014: $Post_t = \mathbb{1}(t \geq 2014m7)$; and ϕ_i are municipality $\times$ year fixed effects. The causal effect of the studied policy (our instrument) is represented by δ_0, which is the coefficient associated to the interaction $Treated_i \times Post_t$. Clustered errors are clusterized at the mother's age level, as suggested by Lee and Card (2008), given the discrete measurement of the assignment variable.

In addition to the estimation of Equation 1, the following section presents the results of several robustness checks conducted to ensure the stability of our findings. We estimated a simplified version of the model by excluding municipality-by-year fixed effects. we changed the original definition of the pre- and post-treatment periods by reducing the number of years considered before and after the policy or by deleting the first one or first two years of the post-treatment period. Additionally, we performed a donut-hole approximation by removing units in the nearest neighborhood of the threshold and conducted a placebo test using a fake threshold at the age of 21. Finally, we executed a balance test on variables that were not supposed to change with the policy.

Figure 1: Non-affiliation Rate by Mother's Age at Birth: Pre- and Post-Treatment Periods



Note: This figure illustrates the proportion of women without health insurance at the time of delivery (y-axis) according to their age (x-axis), distinguishing between births occurring during the pre-treatment and post-treatment periods. Data includes births from mothers aged between 12 and 30 years at the time of delivery. The pre-treatment period covers July 2011 to June 2014, and the post-treatment period covers July 2014 to June 2017. The red line denotes the cutoff at 18 years.

5 Results

Table 2 presents the estimates of Equation 1. Column (1) reports the mean values of all variables for mothers aged 18 in the pre-treatment period. In Panel A, columns (2) to (4) provide first-stage estimates using three distinct bandwidths (1, 2, and 3 years) centered around the threshold age of 18. In Panel B, for each outcome variable we present reduced-form estimates employing the same variations in bandwidths as in Panel A, while column (5) showcases two-stage least squares estimates exclusively for the 3-year bandwidth.

The first-stage reveals the impact of the instrument (the $Treated \times Post$ interaction) on the treatment variable (*non-affiliation* status). This effect is consistently negative and statistically significant, indicating that the policy led to a reduction of the non-affiliation rate of about 1.6 percentage points (equivalent to approximately 18.3% to 19.5% when compared to women aged 18 in the pre-treatment period)[18]. This is consistent with the increase in the proportion of individuals affiliated with the Contributory Regime (it became more common for young adults to remain in this regime as dependent beneficiaries) and the decrease in the proportion of individuals affiliated with the Subsidized Regime (as the number of people losing coverage in the RC decreases, the migration to the RS has also declined). These estimates align with what is observed in Figure 2, where we plot the difference in means for *non-affiliation* between the post- and pre-treatment periods across the mother's age at birth. This figure confirms us that once we carry out the first difference in time in our treatment variable, there is still a discontinuity to exploit at the 18-year threshold.

Moving to Panel B, reduced-form estimates show the effect of the instrument on the outcomes of interest. First, the policy had a significant and positive, though relatively small, effect on the number of prenatal visits (0.4% increase compared to 18-year-old women in the pre-treatment period). Contrary to what would be originally expected, it reduced the gestation period, consequently increasing the probability of preterm births by 5.5%-8%. The direction of the effect on the probability of cesarean or spontaneous deliveries varies between positive and negative depending on the bandwidth used, and it loses statistical significance with a 3-year bandwidth. However, the impact of the policy consistently shows a positive effect for instrumental deliveries, resulting in an increase ranging from 1.8% to 6.4% compared to the rates observed in mothers aged 18 before the policy.

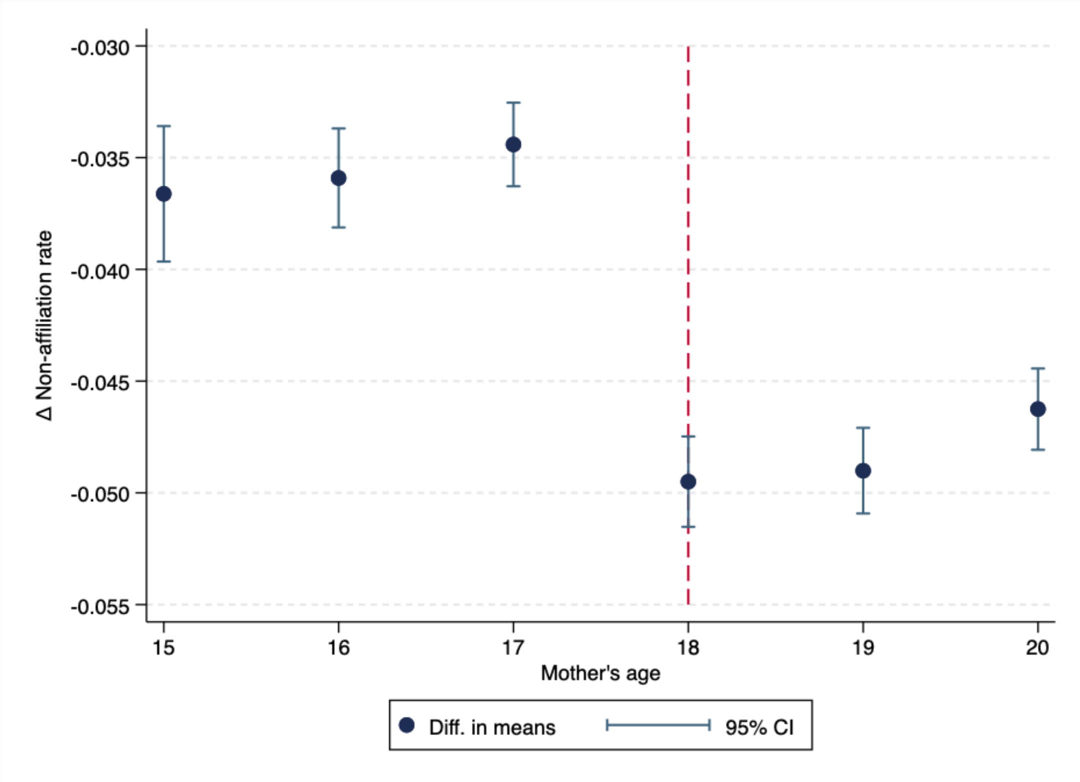
Concerning newborn-related outcomes, the reduced-form estimates reveal an statistically significant decrease of up to 10.3 grams in weight and up to 0.06 cm in length compared to the baseline. Even when the magnitude of these effects is small, it corresponds to an increase of 6.4% in the likelihood of low weight and up to 19% in the likelihood of short length in newborns. The impacts on Apgar test scores exhibit a signif-

[18]For comparison purposes, Figure B4 presents the results of cross-sectional estimates from a regression discontinuity model for each year from 2011 to 2017. This figure illustrates not only how non-affiliation levels decrease year by year but also how the jump at the age of 18 diminishes.

icant and positive influence only when using the 2-year bandwidth. However, for Apgar 5, this contradicts the estimated rise in the occurrence of scores below 7 points. Similar to what we presented for the first-stage, Figures B5 and B6 depict plots of mean differences between post- and pre-treatment values across mothers' age for pregnancy- and newborn-related outcome variables. The graphical representation illustrates some notable discontinuities for the gestational period, weight, length, and their corresponding dummy variables. These are precisely the variables that exhibit more consistent estimates when adjusting the bandwidth.

Finally, two-stage least squares results estimating the effect of non-affiliation on the outcomes of interest show statistically significant effects on gestational period, weight, length and their associated dummy variables. Then, newborns of mothers without health coverage in the SGSSS and whose deliveries are billed to territorial entities have a 31.6 percentage points lower probability of being born with low birth weight and a 29.3 percentage points lower probability of being born with short length.

Figure 2: Mean Difference between Post- and Pre-Treatment Non-affiliation by Mother's Age



Note: This figure illustrates the difference between the post-treatment and pre-treatment non-affiliation (y-axis) across the age of the mother at the time of birth (x-axis). Data includes births from mothers aged between 15 and 20 years at the time of delivery and occurred between July 2011 and June 2017. The red line denotes the cutoff at 18 years.

5.1 Robustness

To assess the robustness of our results across different specifications, we first estimated Equation 1 in a simplified version, excluding the municipality-by-year fixed effects. These results are displayed in Table B2. This simpler model enhances both the significance and magnitude of the policy effects on those variables that showed consistency across different bandwidths in the main results table. For instance, the first stage now shows a decrease of up to 1.7 percentage points in non-affiliation. In contrast to the main results, we now estimate a significant negative effect on prenatal visits, Apgar 1 and Apgar 5 scores. Concerning the type of delivery, Table B2 now indicates a reduction in cesarean deliveries and an increase in spontaneous births under all three bandwidths. However, similar to Table 2, significance is lost with the 3-year bandwidth.

Secondly, Equation 1 was re-estimated by changing the number of years considered before and after the implementation of the policy in June 2014. It is important to note that our main results use a pre- and post-treatment period of 3 years. Now, Table B3 include only births occurring up to 1 year around the treatment (from July 2013 to June 2015), while in Table B4, only births up to 2 years before and after are included (from July 2012 to June 2016). By narrowing the study period, the absolute magnitudes of the first-stage estimates decrease, while the absolute magnitudes of the reduced-form estimates increase, which ultimately results in the 2sls estimates growing as well. Under the scenario outlined in Table B3, the reduced-form estimates for both Apgar scores are negative and statistically significant. In other words, under this specification, the Apgar scores are also negatively affected by the policy.

In our pursuit of exploring alternative time frames, we kept a steady 3-year pre-treatment period and manipulated the starting point for the post-treatment period. Table B5 excludes the initial post-treatment year, focusing solely on data from July 2015 onward. On the other hand, Table B6 omits the first two post-treatment years, focusing on births occurring from July 2016 onward. In these specifications, we observe more pronounced reductions in non-affiliation (up to 2 percentage points) attributable to the policy implementation. Additionally, there are more substantial positive increases estimated in the number of prenatal visits compared to our main results. However, it's worth noting that the magnitudes of the estimates for weight and length are now smaller. After 2 years (B6), the statistical significance of 2sls estimates only remains for prenatal visits and preterm variables: non-affiliation results in a reduction of more than three prenatal visits and a 35.4 percentage point decrease in the likelihood of a preterm birth. Plots of mean differences between post- and pre-treatment values for the first-stage under this time adjustments are present in Figure B7. With certainty, the two types of approximations indicate that the reduction of non-affiliation after the policy is stronger as time goes by.

We also re-estimated the model by removing units in the nearest neighborhood of the threshold. This donut-hole approximation is illustrated in Table B7, where column (1) presents first-stage and reduced-form estimates after excluding mothers who were 17 years old at the time of delivery, column (2) excludes mothers aged 18, and column (3) excludes both. Likewise, columns (4) to (6) depict two-stage least squares results by excluding these age groups. Although the direction of the instrument's effect on non-affiliation, prenatal visits, gestational period, weight, and height remains consistent with the main results, the magnitude tends to change. For instance, by excluding mothers with 18 years, a reduction in non-affiliation of 1.9 percentage points is estimated. Besides, significant changes are observed in the statistical significance of the effects of non-affiliation on the outcomes, as now no effects different from zero are calculated outside the variables related to the type of delivery (*C-section* and *Spontaneous*).

Table B8 presents a placebo test using a fake threshold at the age of 21. Even though some of the first-stage and reduced-form estimators remain significant (though smaller in magnitude), it is true that for none of the outcomes the 2sls etimator is statistically different from zero, which increases confidence in the definition of our instrument. Finally, Table B9 shows the results of estimating the diff-in-disc model on characteristics that in theory should not be modified by the policy. Given the limited availability of these variables in our database, we present only two: *primary education* and *secondary education*. As in the previous case, even though our model does capture statistically significant small reduced-form estimates, they are no longer statistically significant in the 2sls estimates.

5.2 Discussion

In our study, the 2014 policy successfully increased health coverage among young adults after turning 18. However, the rise in health system enrollment is associated with unfavorable outcomes in newborns, such as low gestational age, birth weight and length. These results diverge from the typical findings observed in international literature, which usually report positive health outcomes, commonly explained by increases in the utilization of maternal health services and improvements in their quality (Comfort et al., 2013). Specifically for Colombia, the effect of health insurance on birth weight contradicts the findings of Gaviria and Palau (2006) when analyzing affiliation to the Subsidized Regime.

One of the major limitations of this study is that it solely relies on administrative records of live births, excluding observations of fetal losses. This selection problem, also known as live-birth or survival bias, could be relevant if the treatment exposure not only affects newborn outcomes but it has a direct impact on mortality rates in the early stages of pregnancy. In Colombia, the annual number of fetal deaths varied between 37,294 and 48,619 during our study period (which, when combined with live births, would represent approximately 6.4% of the recorded conceptions). Furthermore, 70% of these fetal deaths occur before the first 22 weeks of gestation. Some studies in Latin American countries such as Brazil (Barros et al., 2005) and Mexico (Pfutze, 2015) have shown associations between insurance and miscarriages and prenatal deaths. If this pattern repeats in Colombia, it could partially explain the obtained results, as it would imply that weaker children are dying before birth, and therefore, those born would be the ones with better outcomes.

In our case, DANE's vital statistics encompass fetal deaths, yet our access was limited to a database version presenting the mother's age variable in ranges rather than completed years, which did not work for our model. For the future, it would be valuable to incorporate this information into our study. However, given that fetal deaths exclude voluntary pregnancy terminations, it remains essential to explore alternative data sources for a comprehensive understanding. This would allow us to investigate the effects of policy and health insurance on outcomes such as miscarriage and stillbirth. Besides, it would offer an indirect opportunity to explore potential associations between these deaths and the socioeconomic characteristics of mothers. An additional consideration involves redefining certain variables to align them with the gestation period. For example, reassessing the number of prenatal visits in relation to gestational weeks would enhance our ability to isolate the impact of health system affiliation from the intrinsic effects of gestation time.

As future work, it would also be important to calculate heterogeneous effects on maternal characteristics, such as marital status or educational level. This is because socially or economically marginalized women may have higher risks during pregnancy due to certain behaviors and exposures (Goin et al., 2021). Another significant source of heterogeneity in the results could arise from the legal nature of hospitals, namely, whether they are public or private. While this information is not directly available in the utilized database, it can be supplemented with data from the Sistema de Información de Prestaciones de Salud (RIPS). This relationship is not novel, as the type of hospital has been associated with various prenatal care practices, such as the rates of C-sections and preterm births (Handler and Rosenberg, 1992; Hernández-Martínez et al., 2019). Other aspects to consider would also include the types of contracts utilized by these healthcare institutions, the level of competition within municipalities, and, correlated with the latter, the area of birth (rural or urban).

Table 2: Diff-in-Disc Estimates - Main Results

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:			First-stage		
Non afiliate	0.0835	-0.0153***	-0.0160***	-0.0163**	
		(0.0001)	(0.0003)	(0.0006)	
D(Contributory Regime)	0.2286	0.0224***	0.0233***	0.0232***	
		(0.0002)	(0.0002)	(0.0002)	
D(Subsidized Regime)	0.6753	-0.0067**	-0.0064***	-0.0061***	
		(0.0003)	(0.0002)	(0.0005)	
Panel B:			Reduced-form		2sls
Pregnancy and delivery-related:					
Prenatal visits	5.6105	0.0237**	0.0065**	0.0179**	-1.0994
		(0.0008)	(0.0019)	(0.0055)	(1.2592)
Gestation period	38.4489	-0.0380***	-0.0560***	-0.0477***	2.9313***
		(0.0001)	(0.0013)	(0.0044)	(1.0778)
D(Preterm)	0.0899	0.0049**	0.0090***	0.0072***	-0.4437***
		(0.0001)	(0.0002)	(0.0009)	(0.1665)
D(C-section)	0.3765	0.0028*	-0.0080***	0.0015	-0.0907
		(0.0002)	(0.0003)	(0.0041)	(0.2403)
D(Spontaneous)	0.6122	-0.0029*	0.0073***	-0.0018	0.1088
		(0.0003)	(0.0003)	(0.0039)	(0.2427)
D(Instrumental)	0.0113	0.0002*	0.0007***	0.0003	-0.0182
		(0.0000)	(0.0000)	(0.0006)	(0.0560)
Newborn-related:					
Weight (g)	3,066.6	-6.872**	-10.269***	-8.012***	491.893*
		(0.326)	(0.538)	(1.182)	(269.585)
Length (cm)	49.488	-0.0468**	-0.0643***	-0.0590***	3.6215**
		(0.0014)	(0.0042)	(0.0044)	(1.6112)
Apgar 1	8.1729	0.0011	0.0074***	0,0017	-0.1046
		(0.0009)	(0.0005)	(0.0036)	(0.4852)
Apgar 5	9.5168	0.0012	0.0027*	-0,0025	0.1565
		(0.0005)	(0.0009)	(0.0026)	(0.4058)
D(Low weight)	0.0921	0.0039**	0.0059***	0.0051***	-0.3161*
		(0.0002)	(0.0001)	(0.0005)	(0.1621)
D(Short length)	0.0306	0.0035**	0.0058***	0.0046***	-0.2831***
		(0.0002)	(0.0001)	(0.0006)	(0.0998)
D(Low Apgar 1)	0.0397	-0.0007*	-0.0032***	-0.0007	0.0444
		(0.0001)	(0.0002)	(0.0012)	(0.1034)
D(Low Apgar 5)	0.0096	0.0005*	0.0004**	0.0012*	-0.0716
		(0.0001)	(0.0001)	(0.0005)	(0.0516)
Observations	112,299	394,845	766,704	1,088,501	1,088,501
Obs. Left		183,774	318,273	393,754	393,754
Obs. Right		211,071	448,431	694,747	694,747

Notes: This table presents the estimation results of Equation 1. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at childbirth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

6 Conclusions

In Colombia, hospitals and clinics are obligated to provide healthcare to pregnant women regardless of their insurance status. Therefore, their coverage condition does not define the viability of being admitted to a hospital, but it determines which entity (whether an insurer or the territorial entity in the case of non-insurance) is billed for the services provided. Even though this billing process should not impact prenatal and childbirth care, it is possible that they may be affected, as these administrative procedures have financial implications for health providers. In this paper, we study how changes in reimbursement mechanisms for the payment of healthcare services can impact outcomes associated with pregnancy, childbirth and newborns.

Because of the endogeneity of insurance coverage (Buchmueller et al., 2005), we use an exogenous variation in affiliation to the Colombian healthcare system resulting from a policy change in 2014. The objective of this policy was to enhance health coverage for young adults, enabling them to retain their dependent beneficiary status beyond the age of 18 through the relaxation of specific requirements. Given that the assignment rule of this policy presents us with two exploitable types of variation—time variation (before and after June 2014) and discontinuity variation (below and above 18 years)—we rely on a differences-in-discontinuities design. The data used consisted of records from the universe of births in Colombia from 2011 to 2017.

We found that the aforementioned policy was able to reduce health uninsurance by approximately 19% compared to 18-year-old women in the pre-treatment period. The results showed that the effect was stronger in periods further away from the implementation of the policy. This in turn resulted in more people remaining enrolled in the contributory regime and fewer people moving to the subsidized regime.

Meanwhile, non-affiliation to the health system is associated with a 44 percentage points reduction in the occurrence of preterm births. This is also aligned with a 32 pp reduction in the incidence of low birth weight and a 28 pp reduction in the incidence of short length. Both the graphical evidence and the survival of the effects on these variables under different model specifications validate the above results. In contrast, the effects of either the policy or health insurance on prenatal visits and on the type of delivery (cesarean or spontaneous) were not consistent in direction or statistical significance across the different model specifications, so it is difficult to determine that one or the other is the pathway driving the findings. In other words, it is well-known that insufficient prenatal care and negligence on deliveries are risk factors for preterm birth and consequently, low birth weight and stature. However, as our evidence on these variables is not consistent, we cannot assert that they are the factors that have determined the negative effects of the policy on birth outcomes.

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Appendix A: The Colombian Healthcare System

Before the current Colombian healthcare system came into effect, only a quarter of the population had insurance coverage. Essentially, healthcare services were provided by one of three subsectors: the social security system for formal workers, the government's public assistance for the uninsured, and the private sector for those who could afford it. However, there was a staggering inequality, as state resources failed to reach the poorest. In fact, 80% of the people using public facilities did not belong to the poorest quintile of the population (Giedion et al., 2007).

Nowadays, healthcare system in Colombia is based on Law 100 of 1993, which created the General System of Social Security in Health (SGSSS). This system embraced the ideas of the "structured pluralism", which aimed to moderate the segregation of social groups and the vertical integration previously observed. In contrast, this innovative model allocated explicit and specialized roles to various public and private entities, operating under transparent rules that aimed to address market imperfections effectively (Londoño and Frenk, 1997).

The roles and responsibilities are assigned as follows. The National Government directs, regulates and oversees essential healthcare services, ensuring that all stakeholders are appropriately engaged. Even so, it doesn't have direct influence over their operational issues. The insurers, known as Health Promoting Entities (EPS), are responsible for enrolling individuals, collecting contributions from them, and providing a comprehensive package of healthcare benefits (PBS) through contracts with a network of healthcare providers. Healthcare services are supplied by Healthcare Provider Institutions (IPS), whether public or private.

Users, who can freely choose their insurer, get access to the system through the Contributory Regime (CR) or the Subsidized Regime (SR). The Contributory Regime includes all individuals with the financial means, such as formal employees, public servants, pensioners, and self-employed workers with stable incomes exceeding the minimum wage. The amount of contribution depends on individuals' monthly incomes and is directly paid to the EPS. For employees, the contribution is 12.5% of their monthly salary, with 4% paid by the employee and 8.5% by the employer. Pensioners contribute 12% of their pension benefits, while self-employed workers pay the entire 12.5% based on their contribution base income, equivalent to 40% of their monthly earnings, ensuring it is not lower than the minimum wage. Indeed, payments made by contributors vary according to their income, but the benefits they receive from the system are uniform for all, irrespective of their contribution amount.

On the other hand, the Subsidized Regime is intended for enrollment by the most vulnerable population not covered by the RC, who must demonstrate their poverty status through the Social Programs Potential Beneficiaries Identification System (SISBEN). Special groups like indigenous people and those facing displacement can also join this regime without requiring prior registration in the SISBEN. Beneficiaries of the Subsidized Regime will also have access to the healthcare benefits plan without making contributions to their EPS and without paying moderation fees. Initially, the PBS of the RS encompassed only a fraction of the benefits outlined in the RC benefit plan. Nevertheless, over time, both plans were eventually consolidated: first for children under 12 years in 2009, then for those under 18 years the following year, and ultimately in 2012, benefit parity was achieved for members of all ages.

The financing of the SGSSS is achieved through the collection of social security payments from the Contributory Regime, and fiscal funds from the central government and municipalities. Prior to August 2017 and during the study period analyzed in this paper, the allocation of these funds was managed by the Solidarity and Guarantee Fund (FOSYGA). This fund distributed resources to both public and private insurers, providing each EPS with a fixed payment per affiliated member, referred to as the Capitation Payment Unit (UPC). Since the risk premium varies based on gender, age, and area, but not on health status, risk distribution occurs within the EPS. Historically, just as the benefit plans differed between regimes for several years, so did the value of the UPC. In 2011, for the Contributory Regime, an extra premium of 11.47% was added to the UPC of the Subsidized Regime[19].

[19] See Acuerdo 019 de 2010.

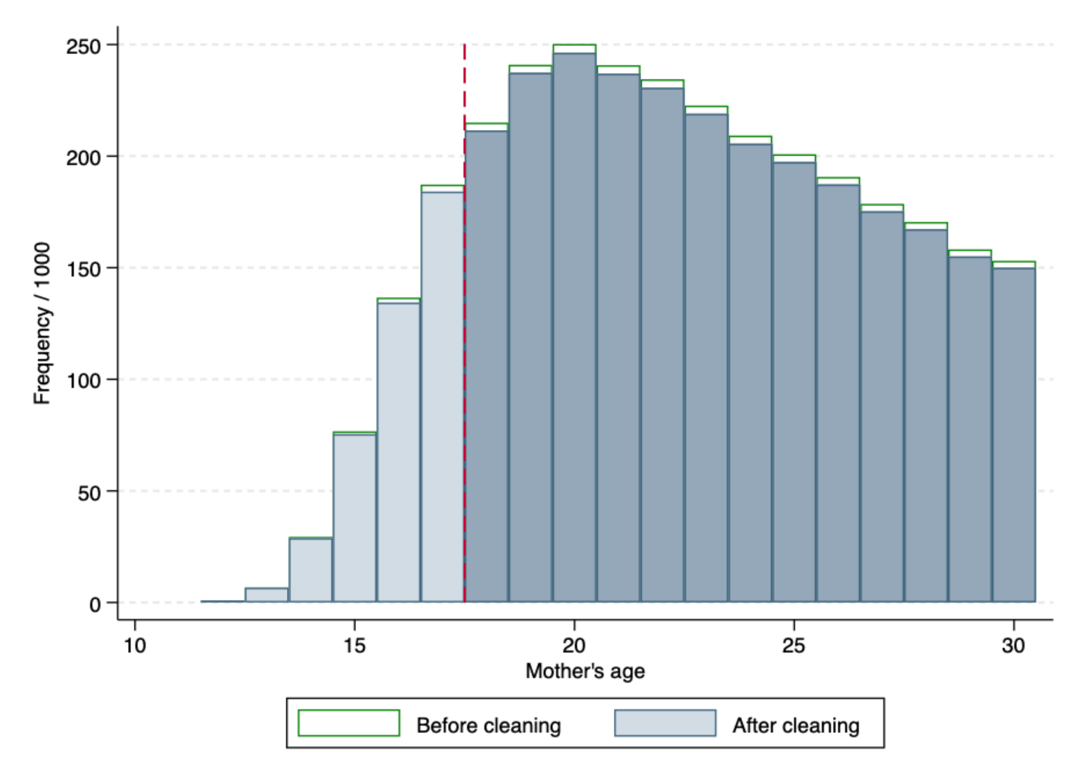
Since the introduction of Law 100 in 1993, healthcare coverage experienced gradual growth, reaching over 60% coverage by 2003 and over 80% by 2008. By 2010, nearly 95.7% of the population had some form of health insurance, with the Contributory Regime covering the majority at 51.4% and the Subsidized Regime at 39.4%. While Law 100 established principles of universality, mandatory participation, and continuity in the healthcare system, there are situations in practice where individuals are left without access to health services. This primarily affects temporarily unemployed workers, self-employed individuals who lack economic stability to make contributions to the integrated payroll, and dependents children who exceed the age limit.

The Law 100 of 1993 also anticipated that, while universal coverage in the system was not achieved, individuals lacking financial means and not yet affiliated to the RS would receive healthcare services from public facilities. This public network is mainly made up of the State Social Enterprises (ESE), public hospitals that gained administrative autonomy and independent assets through the reform. After 1993, a transformation process began in the financing of these entities, gradually reducing supply-side subsidies in favor of demand-side subsidies[20]. Consequently, public healthcare providers were encouraged to compete, just like their private counterparts. They entered the market to negotiate contracts, funding their operations through service charges, as the system's coverage expanded (Giedion et al., 2007).

[20]Previously, the state directly transferred resources to public hospitals for their operation. The amount of these resources was calculated based on historical annual budgets adjusted for inflation and deficit levels. See Resolución 5089 de 1997.

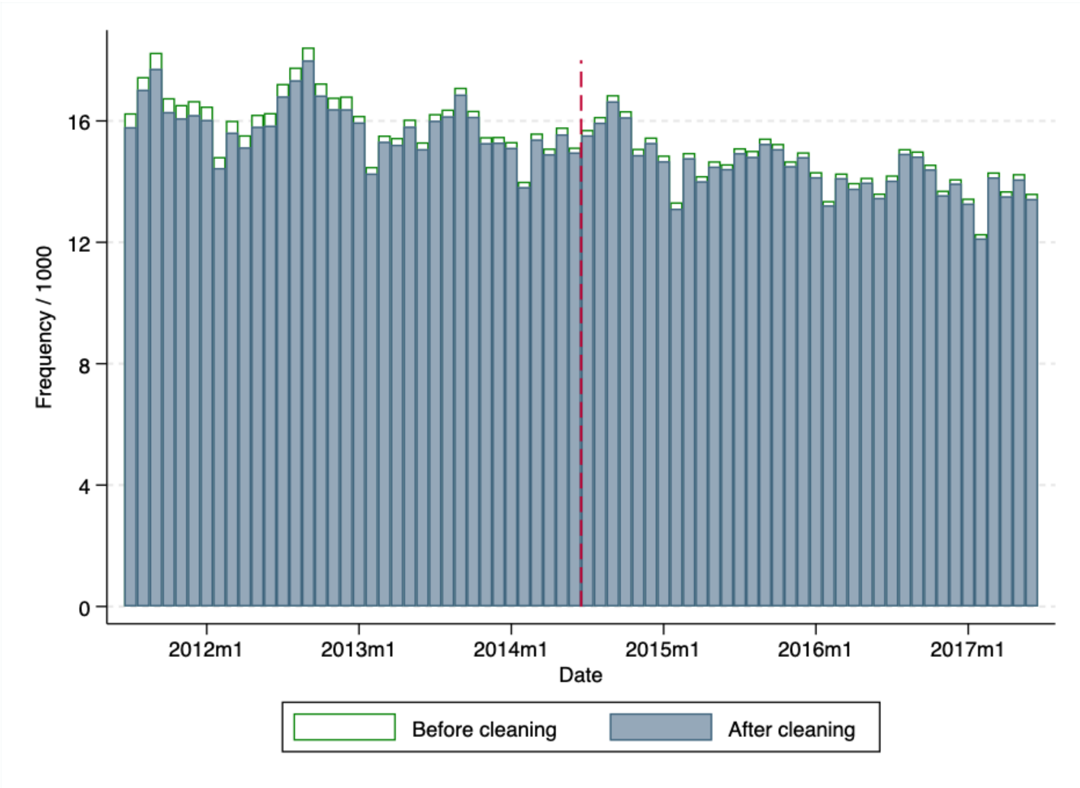
Appendix B: Figures and Tables

Figure B1: Distribution of Mother's Age at Birth (in thousands)



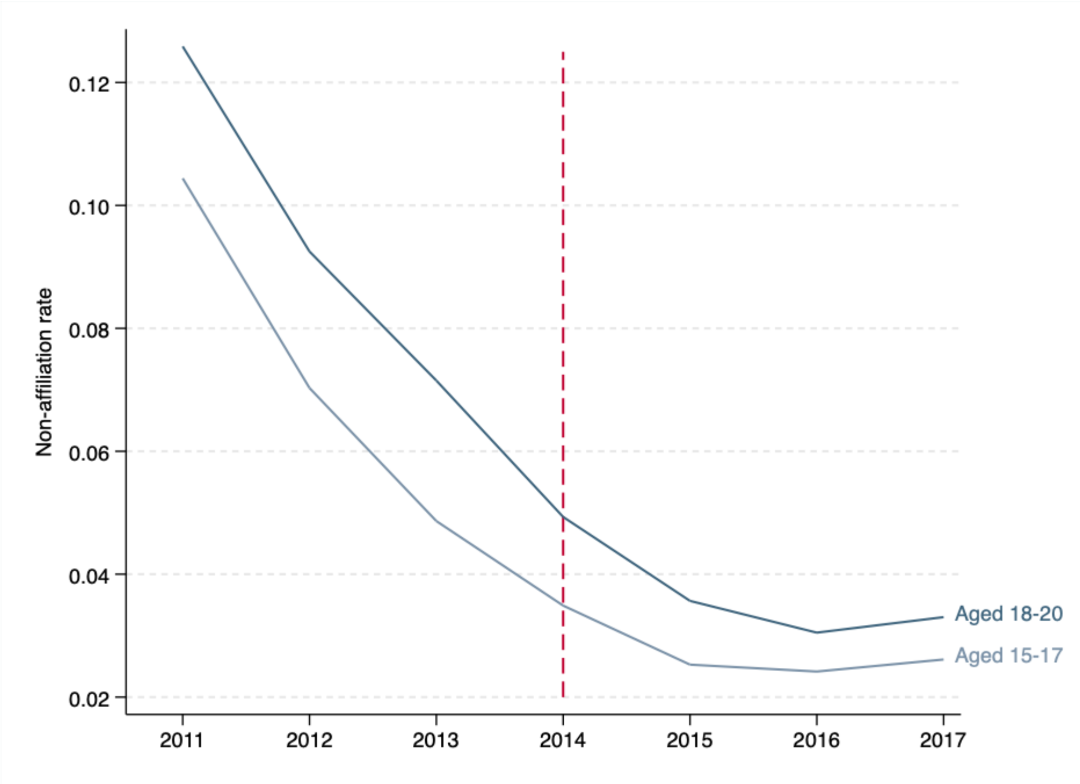
Note: This figure illustrates the histogram of mothers' ages at the time of birth. The vertical axis represents frequency in thousands. Each bin has a width of 1 year of age. Data includes births from mothers aged between 12 and 30 years at the time of delivery and occurred between July 2011 and June 2017. The red line denotes the cutoff at 18 years.

Figure B2: Distribution of Birth Dates (in thousands)



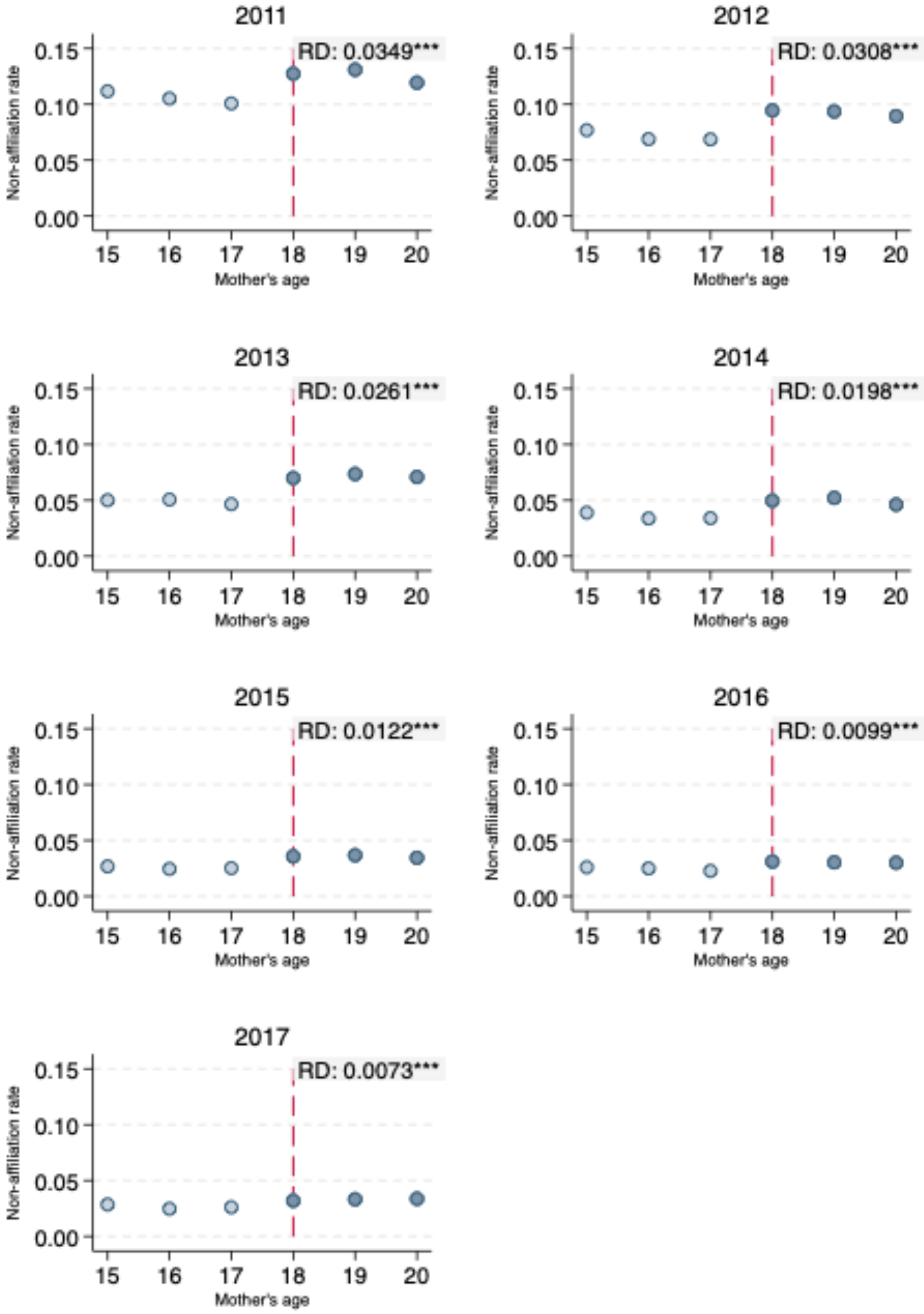
Note: This figure illustrates the histogram of birth dates. The vertical axis represents frequency in thousands. Each bin has a width of 1 month. Data includes births from mothers aged between 15 and 20 years at the time of delivery and occurred between July 2011 and June 2017. The red line indicates the treatment date in June 2014.

Figure B3: Non-affiliation Rate over Time



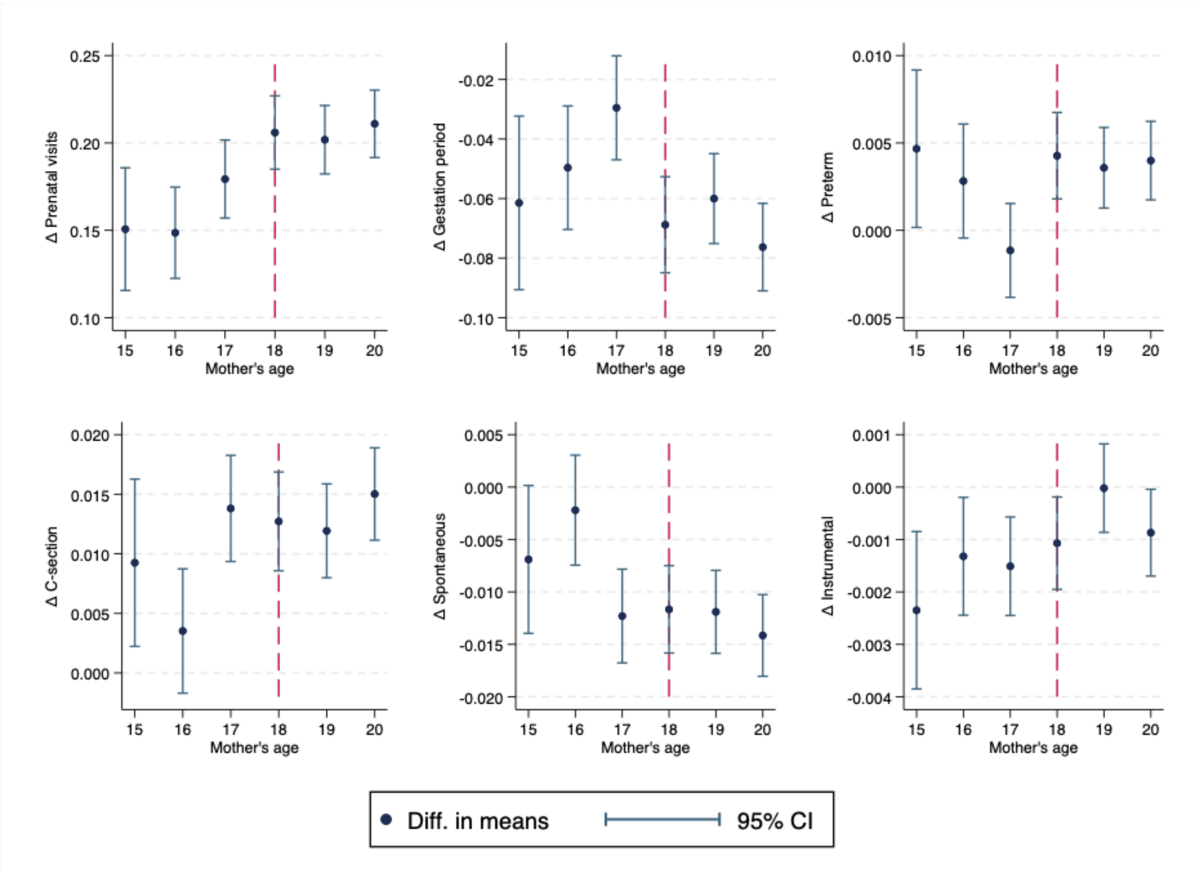
Note: This figure illustrates the rate of mothers without health insurance at the time of childbirth (y-axis) across the years (x-axis). Data includes births from mothers aged between 15 and 20 years at the time of delivery and occurred between January 2011 and December 2017. The red line indicates the treatment date in 2014.

Figure B4: Estimated Discontinuity in Non-affiliation Rate at Age 18: Cross-sectional Approximation



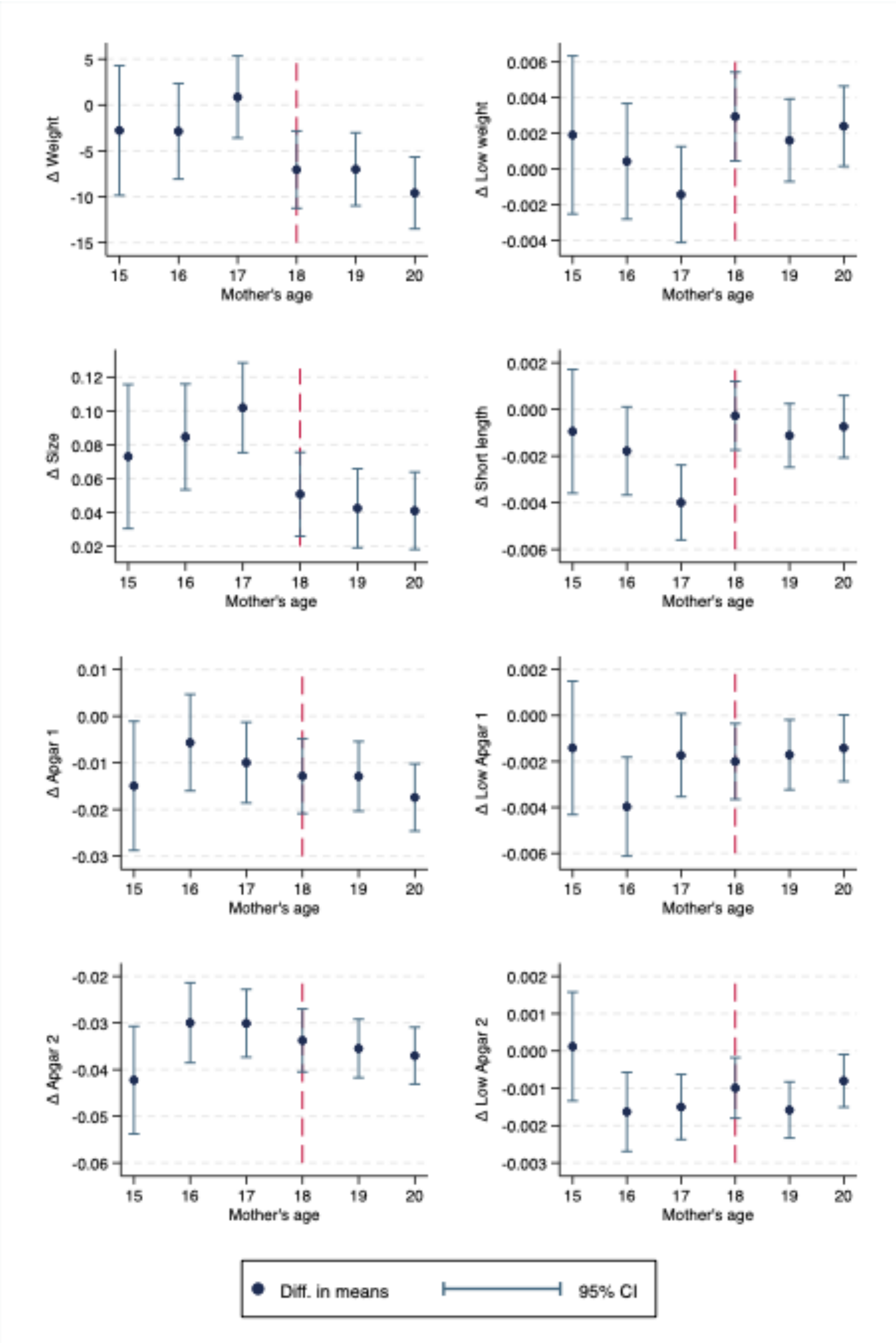
Notes: This figure illustrates, for each year from 2011 to 2017, the rate of mothers without health insurance (y-axis) across their age at the time of birth (x-axis). In the upper right corner of each panel, we present the estimated discontinuity at the age of 18, derived from the following local linear regression model using a bandwidth of 3 years: $y = \beta_0 + \beta_1 Age + \beta_2 D + \beta_3 Age \times D$. The red line denotes the cutoff at 18 years.

Figure B5: Mean Difference between Post- and Pre-Treatment in Pregnancy and Delivery-Related Variables



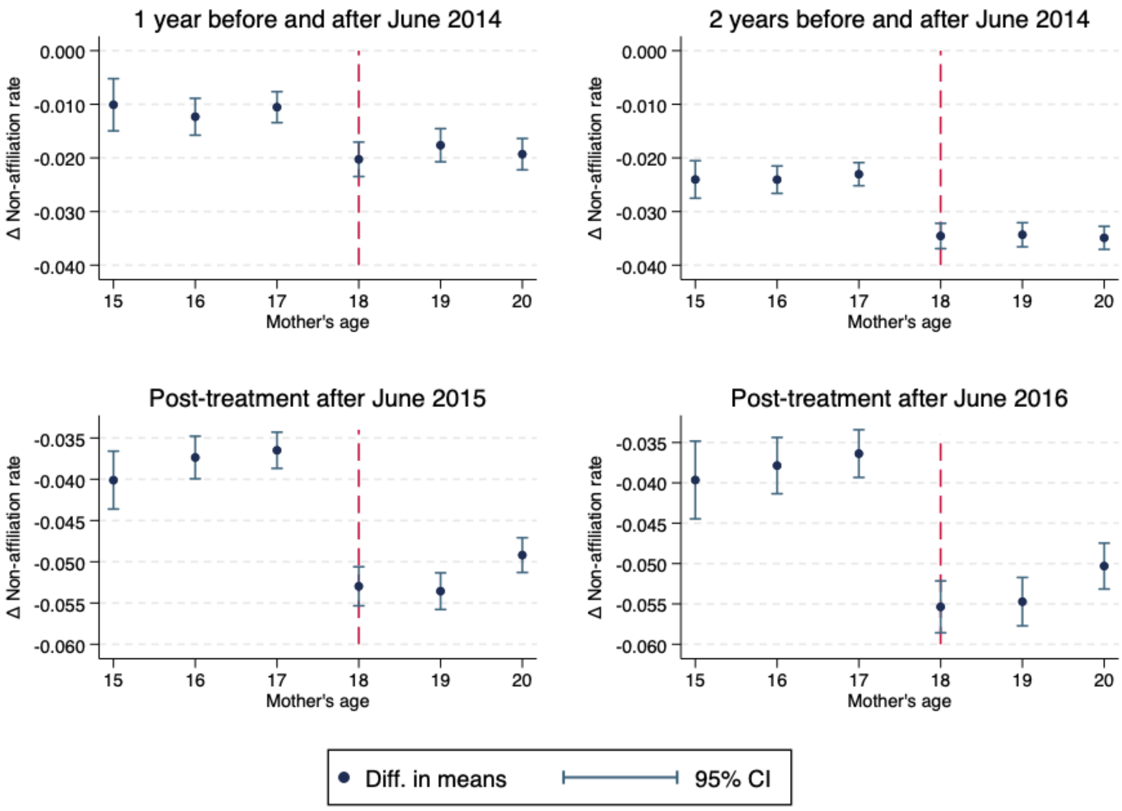
Note: This figure illustrates the difference between the post-treatment and pre-treatment outcome values related to pregnancy and birth (y-axis) across the age of the mother at the time of birth (x-axis). Data includes births from mothers aged between 15 and 20 years at the time of delivery and occurred between July 2011 and June 2017. The red line denotes the cutoff at 18 years

Figure B6: Mean Difference in Post-and Pre-Treatment in Newborn-Related Variables



Note: This figure illustrates the difference between post-treatment and pre-treatment outcome values related to newborns (y-axis) across the age of the mother at the time of birth (x-axis). Data includes births from mothers aged between 15 and 20 years at the time of delivery and occurred between July 2011 and June 2017. The red line denotes the cutoff at 18 years.

Figure B7: Mean Difference between Post- and Pre-Treatment Non-affiliation Rate by Mother's Age (variations of the main model)



Note: This figure illustrates the difference between the post-treatment and pre-treatment non-affiliation rates (y-axis) across the age of the mother at the time of birth (x-axis). Each panel represents a variation of Figure 2, where the time period considered is adjusted. The top-left panel spans one year before and after treatment, including births between July 2013 and June 2015. The top-right panel extends to a two-year period before and after treatment, covering births between July 2012 and June 2016. In the bottom panels, the pre-treatment period remains fixed at three years, while the post-treatment period varies from its start. In the bottom-left panel, the post-treatment period begins one year later, considering births from July 2015 onward. In the bottom-right panel, the post-treatment period commences two years later, incorporating births from July 2016 onward. Data includes births from mothers aged between 15 and 20 years at the time of delivery. The red line denotes the cutoff at 18 years.

Table B1: Dictionary of variables

Variable	Definition
Mother's age	Number of completed years from birthday at the time of delivery
D(Married)	Dummy = 1 if the mother is married at the time of delivery; 0 otherwise (separated, divorced, widow, or single)
D(Primary education)	Dummy = 1 if the highest education level completed by the mother at the time of delivery is secondary; 0 otherwise
D(Secondary education)	Dummy = 1 if the highest education level completed by the mother at the time of delivery is secondary; 0 otherwise
D(High school)	Dummy = 1 if the highest education level completed by the mother at the time of delivery is high school; 0 otherwise
D(Non-affiliate)	Dummy = 1 if the mother belongs Dummy = 1 if the mother is not affiliated with the healthcare system at the time of delivery; 0 otherwise
D(Contributory Regime)	Dummy = 1 if the mother belongs to the Contributory Regime at the time of delivery; otherwise
D(Subsidized Regime)	Dummy = 1 if the mother belongs to the Subsidized Regime at the time of delivery; otherwise
Prenatal visits	Number of prenatal visits attended by the mother before childbirth
Gestation period	Gestation period in weeks
D(Preterm)	Dummy = 1 if the gestation period was less than 27 weeks; 0 otherwise
D(C-section)	Dummy = 1 if the birth was delivered through a Cesarean section; 0 otherwise
D(Spontaneous)	Dummy = 1 if the vaginal delivery was spontaneous (without instrumental assistance); 0 otherwise
D(Instrumental)	Dummy = 1 if the vaginal delivery was assisted instrumentally (for example, with forceps); 0 otherwise
D(Female)	Dummy = 1 if the newborn if female, and 0 if he is male
Weight	Birth weight in grams (g)
Size	Birth size in centimeters (cm)
Apgar 1	Score assigned to the newborn during the Apgar test conducted 1 minute after birth
Apgar 5	Score assigned to the newborn during the Apgar test conducted 5 minutes after birth
D(Low weight)	Dummy = 1 if the newborn's weight is less than 2500 grams; 0 otherwise
D(Short length)	Dummy = 1 if the newborn's height is below two standard deviations from the mean; 0 otherwise
D(Low Apgar 1)	Dummy = 1 if Apagar 1 score is below 7; 0 otherwise
D(Low Apgar 5)	Dummy = 1 if Apagar 5 score is below 7; 0 otherwise

Table B2: Diff-in-Disc Estimates - No Municipality-by-Year Fixed Effects

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:		First-stage			
Non afiliate	0.0835	-0.0151***	-0.0166***	-0.0165***	
		(0.0000)	(0.0000)	(0.0005)	
D(Contributory Regime)	0.2286	0.0279***	0.0251***	0.0260***	
		(0.0000)	(0.0000)	(0.0005)	
D(Subsidized Regime)	0.6753	-0.0125***	-0.0072***	-0.0086***	
		(0.0000)	(0.0000)	(0.0011)	
Panel B:		Reduced-form			2sls
Pregnancy and delivery-related:					
Prenatal visits	5.6105	0.0266***	-0.0041***	0.0103	-0.6234
		(0.0000)	(0.0000)	(0.0083)	(0.4709)
Gestation period	38.45	-0.0393***	-0.0594***	-0.0506***	3.0637***
		(0.0000)	(0.0000)	(0.0059)	(0.3881)
D(Preterm)	0.0899	0.0054***	0.0094***	0.0081***	-0.4875***
		(0.0000)	(0.0000)	(0.0006)	(0.0339)
D(C-section)	0.3765	-0.0011***	-0.0114***	-0.0034	0.2032
		(0.0000)	(0.0000)	(0.0040)	(0.2183)
D(Spontaneous)	0.6122	0.0006***	0.0107***	0.0030	-0.1835
		(0.0000)	(0.0000)	(0.0036)	(0.1991)
D(Instrumental)	0.0113	0.0004***	0.0006***	0.0003	-0.0197
		(0.0000)	(0.0000)	(0.0005)	(0.0274)
Newborn-related:					
Weight (g)	3,066.6	-7.911***	-11.643***	-9.068***	548.976***
		(0.0000)	(0.0000)	(1.1054)	(65.0558)
Length (cm)	49.4877	-0.0512***	-0.0685***	-0.0668***	4.0436***
		(0.0000)	(0.0000)	(0.0018)	(0.0467)
Apgar 1	8.1729	-0.0029***	0.0014***	-0.0049	0.2949
		(0.0000)	(0.0000)	(0.0034)	(0.1923)
Apgar 5	9.5168	-0.0037***	-0.0035***	-0.0101**	0.6137***
		(0.0000)	(0.0000)	(0.0030)	(0.1722)
D(Low weight)	0.0921	0.0044***	0.0062***	0.0056***	-0.3409***
		(0.0000)	(0.0000)	(0.0005)	(0.0334)
D(Short length)	0.0306	0.0037***	0.0059***	0.0050***	-0.3025***
		(0.0000)	(0.0000)	(0.0004)	(0.0270)
D(Low Apgar 1)	0.0397	-0.0003***	-0.0025***	0.0000	-0.0023
		(0.0000)	(0.0000)	(0.0012)	(0.0641)
D(Low Apgar 5)	0.0096	0.0005***	0.0004***	0.0011*	-0.0679**
		(0.0000)	(0.0000)	(0.0005)	(0.0315)
Observations	112,299	395,615	767,269	1,089,000	1,089,000
Obs. Left		184,106	318,470	393,902	393,902
Obs. Right		211,509	448,799	695,098	695,098

Notes: This table presents the estimation results of Equation 1 without including municipality-by-year fixed effects. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B3: *Diff-in-Disc Estimates - 1 Year Before and After (July 2013 - June 2015)*

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:			First-stage		
Non afiliate	0,0607	-0.0107***	-0.0127***	-0.0099***	
		(0.0000)	(0.0002)	(0.0012)	
D(Contributory Regime)	0,2247	0.0157***	0.0117***	0.0073*	
		(0.0001)	(0.0002)	(0.0032)	
D(Subsidized Regime)	0.7040	-0.0065***	-0.0013**	0.0017	
		(0.0000)	(0.0004)	(0.0025)	
Panel B:			Reduced-form		2sls
Pregnancy and delivery-related:					
Prenatal visits	5.7480	0.0022	-0.0244**	0.0353***	3.5599
		(0.0026)	(0.0033)	(0.0072)	(3.9107)
Gestation period	38,4245	-0.0608**	-0.0854***	-0.0813***	8.1957**
		(0.0013)	(0.0014)	(0.0036)	(3.8788)
D(Preterm)	0,0903	0.0086**	0.0153***	0.0117***	-1.1822**
		(0.0000)	(0.0003)	(0.0017)	(0.5837)
D(C-section)	0.3897	0.0029*	-0.0083***	0.0024	-0.2372
		(0.0004)	(0.0006)	(0.0043)	(0.6856)
D(Spontaneous)	0.5992	-0.0019	0.0094***	-0.0010	0.1022
		(0.0005)	(0.0006)	(0.0042)	(0.6898)
D(Instrumental)	0.0112	-0.0010**	-0.0011****	-0.0013	0.1349
		(0.0001)	(0.0000)	(0.0007)	(0.1650)
Newborn-related:					
Weight (g)	3067.6	-7.9251**	-18.3669***	-9.6406*	971.6772
		(0.4423)	(1.1851)	(3.8859)	(806.2165)
Length (cm)	49,5462	-0.0819**	-0.1154***	-0.0961***	9.6875*
		(0.0016)	(0.0039)	(0.0106)	(5.3389)
Apgar 1	8.1785	-0.0186**	-0.0355***	-0.0308***	3.1039*
		(0.0010)	(0.0020)	(0.0020)	(1.7008)
Apgar 5	9.5038	-0.0074**	-0.0208***	-0.0134**	1.3539
		(0.0003)	(0.0014)	(0.0047)	(1.2330)
D(Low weight)	0.0910	0.0061**	0.0092***	0.0065***	-0.6591
		(0.0002)	(0.0004)	(0.0012)	(0.4902)
D(Short length)	0,0289	0.0068**	0.0112***	0.0077***	-0.7776**
		(0.0001)	(0.0003)	(0.0014)	(0.3620)
D(Low Apgar 1)	0.0379	0.0017	0.0029***	0.0023***	-0.2357
		(0.0003)	(0.0004)	0.0003	(0.2997)
D(Low Apgar 5)	0.0098	0.0017**	0.0028***	0.0036***	-0.3625*
		(0.0001)	(0.0002)	(0.0005)	(0.1857)
Observations	36,767	132,697	257,312	365,101	365,101
Obs. Left		61,218	105,149	130,141	130,141
Obs. Right		71,479	152,163	234,960	234,960

Notes: This table presents the estimation results of Equation 1 narrowing the study period to 1 year before and after the treatment. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B4: Diff-in-Disc Estimates - 2 Years Before and After (July 2012 - June 2016)

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:			First-stage		
Non afiliate	0,0713	-0.0118***	-0.0127***	-0.0121***	
		(0.0001)	(0.0002)	(0.0003)	
D(Contributory Regime)	0,2293	0.0184***	0.0173***	0.0196***	
		(0.0001)	(0.0004)	(0.0009)	
D(Subsidized Regime)	0,6877	-0.0074***	-0.0051***	-0.0073***	
		(0.0001)	(0.0001)	(0.0010)	
Panel B:			Reduced-form		2sls
Pregnancy and delivery-related:					
Prenatal visits	5,672	0.0159**	-0.0182***	-0.0130**	1.0705
		(0.0012)	(0.0026)	(0.0049)	(2.1185)
Gestation period	38,4433	-0.0484***	-0.0783***	-0.0596***	4.9091**
		(0.0004)	(0.0022)	(0.0078)	(1.9066)
D(Preterm)	0,0899	0.0051**	0.0108***	0.0070**	-0.5741**
		(0.0001)	(0.0002)	(0.0017)	(0.2802)
D(C-section)	0.3842	0.0032**	-0.0086***	-0.0002	0.0162
		(0.0002)	(0.0002)	(0.0035)	(0.3942)
D(Spontaneous)	0.6046	-0.0032**	0.0086***	0.0002	-0.0164
		(0.0002)	(0.0002)	0.0035	(0.3981)
D(Instrumental)	0.0112	-0.0001	-0.0000	-0.0000	0.0002
		(0.0000)	(0.0000)	(0.0004)	(0.0916)
Newborn-related:					
Weight (g)	3068.1	-9.8936**	-15.9792***	-8.4739*	698.1119
		(0.4731)	(0.5885)	(3.3439)	(450.7290)
Length (cm)	49,5164	-0.0596**	-0.0747***	-0.0573***	4.7203*
		(0.0028)	(0.0038)	(0.0114)	(2.6891)
Apgar 1	8.1750	-0.0043*	-0.0009	-0.0077*	0.6336
		(0.0005)	(0.0012)	(0.0037)	(0.8041)
Apgar 5	9.5100	0.0040*	-0.0075**	-0.0096***	0.7945
		(0.0004)	(0.0018)	(0.0019)	(0.6835)
D(Low weight)	0,0914	0.0056***	0.0085***	0.0061***	-0.5038*
		(0.0000)	(0.0001)	(0.0012)	(0.2748)
D(Short length)	0,0297	0.0046**	0.0072***	0.0051***	-0.4211**
		(0.0002)	(0.0001)	(0.0010)	(0.1728)
D(Low Apgar 1)	0,0391	0.0010*	0.0002	0.0025*	-0.2082
		(0.0001)	(0.0003)	(0.0011)	(0.1733)
D(Low Apgar 5)	0,0094	0.0015**	0.0014***	0.0025**	-0.2050**
		(0.0001)	(0.0002)	(0.0008)	(0.0923)
Observations	74,947	265,078	514,369	730,417	730,417
Obs. Left		122,595	211,871	262,589	262,589
Obs. Right		142,483	302,498	467,828	467,828

Notes: This table presents the estimation results of Equation 1 narrowing the study period to 2 years before and after the treatment. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B5: Diff-in-Disc Estimates - Treatment 1 Year After (Since July 2015 Onward)

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:			First-stage		
Non afiliate	0,0835	-0.0163***	-0.0164***	-0.0186***	
		(0.0002)	(0.0003)	(0.0012)	
D(Contributory Regime)	0.2286	0.0279**	0.0293***	0.0312***	
		(0.0006)	(0.0003)	(0.0011)	
D(Subsidized Regime)	0.6753	-0.0110**	-0.0112***	-0.0115***	
		(0.0005)	(0.0003)	(0.0002)	
Panel B:			Reduced-form		2sls
Pregnancy and delivery-related:					
Prenatal visits	5.6105	0.0406**	0.0321***	0.0455***	-2.4511*
		(0.0023)	(0.0024)	(0.0068)	(1.2597)
Gestation period	38.4489	-0.0284**	-0.0423***	-0.0349**	2.8819*
		(0.0006)	(0.0013)	(0.0042)	(1.0406)
D(Preterm)	0.0899	0.0034***	0.0064***	0.0053***	-0.2874*
		(0.0000)	(0.0001)	(0.0007)	(0.1610)
D(C-section)	0.3765	0.0037**	-0.0071***	0.0007	-0.0356
		(0.0002)	(0.0002)	(0.0035)	(0.2391)
D(Spontaneous)	0.6122	-0.0042**	0.0059***	-0.0017	0.0896
		(0.0002)	(0.0002)	(0.0033)	(0.2415)
D(Instrumental)	0.0113	0.0006***	0.0012***	0.0010	-0.0540
		(0.0000)	(0.0001)	(0.0006)	(0.0562)
Newborn-related:					
Weight (g)	3,066.6	-7.0543**	-10.2941***	-8.3354***	448.8758*
		(0.5536)	(0.6778)	(1.3096)	(267.8967)
Length (cm)	49.4877	-0.0404***	-0.0600***	-0.0444***	2.3925
		(0.0002)	(0.0045)	(0.0083)	(1.5748)
Apgar 1	8.1729	0.0059**	0.0207***	0.0109	-0.5844
		(0.0004)	(0.0008)	(0.0062)	(0.4882)
Apgar 5	9.5168	0.0018	0.0064***	-0.0016	0.0871
		(0.0006)	(0.0010)	(0.0046)	(0.4038)
D(Low weight)	0.0921	0.0027**	0.0045***	0.0046***	-0.2453
		(0.0002)	(0.0002)	(0.0002)	(0.1601)
D(Short length)	0.0306	0.0025**	0.0036***	0.0028***	-0.1516
		(0.0001)	(0.0002)	(0.0006)	(0.0955)
D(Low Apgar 1)	0,0397	-0.0010	-0.0048***	-0.0008	0.0452
		(0.0002)	(0.0003)	(0.0019)	(0.1034)
D(Low Apgar 5)	0.0096	0.0001	-0.0004**	0.0005	-0.0275
		(0.0001)	(0.0001)	(0.0006)	(0.0509)
Observations	112,299	330,030	640,786	908,588	908,588
Obs. Left		153,926	267,065	329,995	329,995
Obs. Right		176,104	373,721	578,593	578,593

Notes: This table presents the estimation results of Equation 1, excluding the first post-treatment year. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011-June 2014 and July 2015-June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B6: Diff-in-Disc Estimates - Treatment 2 Year After (Since July 2016 Onward)

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:			First-stage		
Non afiliate	0,0835	-0.0182***	-0.0184***	-0.0201***	
		(0.0002)	(0.0003)	(0.0010)	
D(Contributory Regime)	0.2286	0.0310**	0.0330***	0.0318***	
		(0.0009)	(0.0003)	(0.0011)	
D(Subsidized Regime)	0.6753	-0.0119**	-0.0126***	-0.0112***	
		(0.0008)	(0.0004)	(0.0007)	
Panel B:			Reduced-form		2sls
Pregnancy and delivery-related:					
Prenatal visits	5.6105	0.0434**	0.0486***	0.0695***	-3.4596**
		(0.0023)	(0.0035)	(0.0103)	(1.5226)
Gestation period	38.4489	-0.0319***	-0.0338***	-0.0346***	1.7217
		(0.0001)	(0.0038)	(0.0025)	(1.2360)
D(Preterm)	0.0899	0.0056**	0.0088***	0.0071***	-0.3544*
		(0.0002)	(0.0005)	(0.0011)	(0.1944)
D(C-section)	0.3765	0.0023*	-0.0061***	0.0028	-0.1385
		(0.0003)	(0.0005)	(0.0039)	(0.2847)
D(Spontaneous)	0.6122	-0.0027*	0.0045***	-0.0039	0,1925
		(0.0003)	(0.0004)	(0.0036)	(0.2880)
D(Instrumental)	0.0113	0.0004**	0.0016***	0.0011	-0.0541
		(0.0000)	(0.0001)	(0.0008)	(0.0674)
Newborn-related:					
Weight (g)	3,066.6	-5.8383**	-6.4260***	-8.7863***	437.5155
		(0.3002)	(0.9439)	(1.6964)	(319.1981)
Length (cm)	49.4877	-0.0454**	-0.0693***	-0.0614***	3.0598
		(0.0014)	(0.0058)	(0.0082)	(1.8980)
Apgar 1	8.1729	0.0032**	0.0130***	0.0141**	-0.7040
		(0.0001)	(0.0006)	(0.0052)	(0.5878)
Apgar 5	9.5168	0.0038	0.0105**	0,0071	-0.3516
		(0.0015)	(0.0024)	(0.0039)	(0.4838)
D(Low weight)	0.0921	0.0009	-0,0004	0.0024*	-0.1193
		(0.0005)	(0.0005)	(0.0010)	(0.1876)
D(Short length)	0.0306	0.0022**	0.0031***	0.0028***	-0.1387
		(0.0001)	(0.0002)	(0.0003)	(0.1136)
D(Low Apgar 1)	0,0397	-0.0018*	-0.0057***	-0.0045**	0.2236*
		(0.0002)	(0.0001)	(0.0013)	(0.1281)
D(Low Apgar 5)	0.0096	-0.0004	-0.0003*	-0,0002	0.0096
		(0.0002)	(0.0001)	(0.0003)	(0.0610)
Observations	112,299	269,712	521,545	736.591	736.591
Obs. Left		126,474	218,676	269,268	269,268
Obs. Right		143,238	302,869	467,323	467,323

Notes: This table presents the estimation results of Equation 1, excluding the first two post-treatment years. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011-June 2014 and July 2016-June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B7: Diff-in-Disc Estimates - Donut-hole approximation

	(1) No 17	(2) No 18	(3) No 17-18	(4) No 17	(5) No 18	(6) No 17-18
Panel A:		First-stage				
Non afiliate	-0.0158***	-0.0187***	-0.0182***			
	(0.0009)	(0.0002)	(0.0006)			
D(Contributory Regime)	0.0230***	0.0243***	0.0236***			
	(0.0005)	(0.0004)	(0.0005)			
D(Subsidized Regime)	-0.0070***	-0.0047***	-0.0051***			
	(0.0012)	(0.0002)	(0.0008)			
Panel B:		Reduced-form			2sls	
Pregnancy and delivery-related:						
Prenatal visits	0.0552***	0.0180**	0.0533***	-3.4939	-0.9620	-2.9228
	(0.0015)	(0.0057)	(0.0014)	(3.3509)	(1.5062)	(3.0667)
Gestation period	-0.0297***	-0.0341***	-0.0176**	1.8778	1.8269	0.9634
	(0.0034)	(0.0023)	(0.0034)	(2.7185)	(1.2465)	(2.4701)
D(Preterm)	0.0026**	0.0070***	0.0025*	-0.1658	-0.3753*	-0.1391
	(0.0006)	(0.0009)	(0.0009)	(0.4135)	(0.1967)	(0.3828)
D(C-section)	0.0258***	0.0022	0.0266***	-1.6343**	-0.1183	-1.4588**
	(0.0005)	(0.0043)	(0.0006)	(0.8036)	(0.2882)	(0.7109)
D(Spontaneous)	-0.0241***	-0.0042	-0.0265***	1.5234*	0.2238	1.4551**
	(0.0008)	(0.0039)	(0.0006)	(0.7859)	(0.2917)	(0.7140)
D(Instrumental)	-0.0018**	0.0020***	-0.0001	0.1109	-0.1055	0.0037
	(0.0005)	(0.0003)	(0.0001)	(0.1509)	(0.0686)	(0.1358)
Newborn-related:						
Weight (g)	-1.8325**	-6.7528***	-0.9292	116.00043	361.8650	50.9794
	(0.5125)	(0.9783)	(0.8215)	(686.7237)	(318.7950)	(634.7549)
Length (cm)	-0.0424***	-0.0506***	-0.0364***	2.6841	2.7105	1.9955
	(0.0035)	(0.0035)	(0.0019)	(4.1370)	(1.8960)	(3.7900)
Apgar 1	-0.0180***	0.0072	-0.0138***	1.1426	-0.3833	0.7555
	(0.0017)	(0.0040)	(0.0013)	(1.3227)	(0.5818)	(1.1925)
Apgar 5	-0.0171***	-0.0015	-0.0164***	1.0796	0.0795	0.8992
	(0.0008)	(0.0030)	(0.0009)	(1.1154)	(0.4845)	(1.0131)
D(Low weight)	0.0033**	0.0036***	0.0020**	-0.2116	-0.1920	-0.1092
	(0.0003)	(0.0004)	(0.0004)	(0.4157)	(0.1906)	(0.3808)
D(Short length)	0.0019***	0.0034***	0.0007**	-0.1206	-0.1817	-0.0397
	(0.0004)	(0.0004)	(0.0001)	(0.2467)	(0.1152)	(0.2258)
D(Low Apgar 1)	0.0066***	-0.0008	0.0065***	-0.4199	0.0442	-0.3584
	(0.0005)	(0.0013)	(0.0006)	(0.3005)	(0.1237)	(0.2691)
D(Low Apgar 2)	0.0037***	0.0001	0.0026***	-0.2349	-0.0077	-0.1439
	(0.0003)	(0.0004)	(0.0001)	(0.1525)	(0.0608)	(0.1294)
Observations	904,339	876,945	692,748	904,339	876,945	692,748
Obs. Left	209,692	393,694	209,644	209,692	393,694	209,644
Obs. Right	694,647	483,251	483,104	694,647	483,251	483,104

Data includes births between July 2011 and June 2017. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B8: Placebo Test at Fake Threshold (21 Years) - Diff-in-Disc Estimates

	(1)	(2)	(3)	(4)
	bw = (1,1)	bw = (2,2)	bw = (3,3)	bw = (3,3)
Panel A:		First-stage		
Non afiliate	0.0081**	-0.0042***	-0.0017	
	(0.0002)	(0.0005)	(0.0017)	
D(Contributory Regime)	0.0009**	0.0128***	0.0089***	
	(0.0000)	(0.0004)	(0.0014)	
D(Subsidized Regime)	-0.0081**	-0.0067***	-0.0057***	
	(0.0002)	(0.0008)	(0.0007)	
Panel B:		Reduced-form		2sls
Pregnancy and delivery-related:				
Prenatal visits	0.0144**	0.0286***	0.0052	-3.1364
	(0.0007)	(0.0022)	(0.0065)	(17.9283)
Gestation period	0,0092	0.0113***	0.0005	-0.3183
	(0.0020)	(0.0013)	(0.0097)	(14.0104)
D(Preterm)	-0,0017	-0.0074***	-0.0023	1.3626
	(0.0003)	(0.0003)	(0.0019)	(3.1151)
D(C-section)	0.0021**	0.0026***	0.0006	-0.3893
	(0.0001)	(0.0002)	(0.0010)	(3.4769)
D(Spontaneous)	-0.0031**	-0.0037***	-0.0028*	1.7120
	(0.0001)	(0.0002)	(0.0014)	(4.4169)
D(Instrumental)	0.0009***	0.0010***	0.0022***	-1.3227
	(0.0000)	(0.0001)	(0.0005)	(2.3356)
Newborn-related:				
Weight (g)	3.7866*	-2.2754**	4.1444*	-2500
	(0.4919)	(0.4574)	(1.7757)	(5561.6763)
Length (cm)	0.0154*	0.0111*	-0.0268	16.1652
	(0.0019)	(0.0045)	(0.0150)	(34.7211)
Apgar 1	0,0033	-0,0017	0.0083**	-4.9810
	(0.0008)	(0.0024)	(0.0025)	(10.5265)
Apgar 5	0.0018*	-0.0055***	0.0077	-4.6258
	(0.0002)	(0.0008)	(0.0039)	(9.4316)
D(Low weight)	-0.0018***	-0.0046***	-0.0025*	1.5274
	(0.0000)	(0.0002)	(0.0012)	(3.3163)
D(Short length)	-0,0002	-0,0006	-0.0006	0.3395
	(0.0001)	(0.0003)	(0.0005)	(1.3954)
D(Low Apgar 1)	-0,0004	-0.0005	-0,0020***	1.1852
	(0.0002)	(0.0004)	(0.0005)	(2.4024)
D(Low Apgar 2)	-0,0002	0.0023***	-0.0004	0.2295
	(0.0001)	(0.0001)	(0.0006)	(0.7830)
Observations	482,468	950,600	1,381,156	1,381,156
Obs. Left	245,894	483,327	694,889	694,889
Obs. Right	236,574	467,273	686,267	686,267

Notes: This table presents the estimation results of Equation 1 using a fake threshold at the age of 21. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.

Table B9: Balance Test - Diff-in-Disc Estimates

	(1) Mean at Age 18	(2) bw = (1,1)	(3) bw = (2,2)	(4) bw = (3,3)	(5) bw = (3,3)
Panel A:		First-stage			
Non afiliate	0.0607	-0.0107***	-0.0127***	-0.0099***	
		(0.0000)	(0.0002)	(0.0012)	
Panel B:		Reduced-form			2sls
D(Primary education)	0.1412	-0.0033	-0.0027*	0.0048	-0.4481
		(0.0007)	(0.0009)	(0.0036)	(0.5232)
D(Secondary education)	0.3851	-0.0079**	-0.0065**	-0.0109**	1.0245
		(0.0005)	(0.0012)	(0.0032)	(0.7510)
Observations		379,924	738,151	1,047,868	1,047,868
Obs. Left		176,757	306,141	378,629	378,629
Obs. Right		203,167	432,010	669,239	669,239

Notes: This table presents the estimation results of Equation 1 on balance variables. Column (1) showcases the average values for each variable among 18-year-old women during the pre-treatment period. Columns (2) to (4) present three different bandwidths (1, 2, and 3 years) for the first-stage estimates in Panel A and the reduced-form estimates in Panel B. Column (5) in Panel B provides two-stage least squares estimates for only the 3-year bandwidth. Data includes births between July 2011 and June 2017. All estimates include municipality-by-year fixed effects. Clustered robust standard errors at the mother's age at birth are presented in parenthesis. Significance at the 10% level is presented by *, at the 5% by **, and at the 1% level by ***.