

LONG RUN EFFECTS OF UNIVERSAL HEALTH INSURANCE FOR CHILDREN IN MEXICO^a

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Abstract

We assess the long run effects of The Health Insurance for the Twenty First Century (SMSXXI) Program, part of Mexico's Seguro Popular, that provides public health insurance for uninsured children under 5 years old. We show that the program led to reductions in out of pocket health expenditures by 13%, primarily from expenses incurred on hospitalizations. Infant mortality by causes covered by the program were reduced by 5.3% and effects were largest in high baseline mortality areas. Long run health effects, approximately 8 years after the start of the program are reflected in a 0.44 cm average increase in height for birth cohorts exposed to the program, and anthropometric effects are almost 1cm on average for low-income populations. While no effects were detected on health service utilization, results suggest improvements in the quality of health care and specialized personnel are likely channels to explain final outcomes.

Keywords: Health Insurance, Newborn Health, Child Health, Child Mortality, Mexico

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I. INTRODUCTION

In Mexico, health care for children under five is within the priorities of the health policy agenda and is within the scope of the third objective of the Sustainable Development Goals. The primary purposes of such policies are to bridge the disparities in access to healthcare and health status that remain within the population, provide high-quality health care, and financial protection against health-related catastrophic expenditures. Regarding the health status of children, mortality rates of neonates, infants, and children under five years are proper indicators that signal whether such goals are on track. In Mexico, mortality rates have a downward trend. Between 2000 and 2015 the decline of neonatal mortality rate was from 12.9 to 7.8 deaths per 1,000 live births (LB), the infant mortality rate decreased from 22.5 to 12.6 per 1,000 LB, and under-fives mortality declined from 20 to 14.5 per 1000 LB.^{1,2,3} The deaths that happen in the group of newborns and infants represent 50% of the total deaths that occur in under-fives. The leading causes of neonatal death are sepsis, prematurity, respiratory distress and congenital malformations. With access to high quality antenatal and natal care, more than 60% of these deaths are amenable, in other words, deaths from causes that should not occur if high-quality health care is available. Healthcare of newborns' serious complications requires the availability of highly trained personnel, a functional health services network and neonatal intensive care units that provide high quality care.⁴

Currently, almost all children in Mexico have access to public health insurance. Seguro Popular is a non-contributory public healthcare insurance for those that lack social security; this public healthcare insurance allocates earmarked resources to finance an explicit package of health benefits. Since 2006, Seguro Popular provides full health insurance coverage to children under five years old through three components. (i) The Catalog of Universal Health Services (CAUSES

Spanish acronym) that finances primary care. (ii) The program Medical Insurance Century XXI (SMSXXI) that focuses exclusively on children under five years old, and (iii) The Fund for Protection Against Catastrophic Expenditures (FPGC) that for children under five years finances tertiary care treatments such as surgery for congenital malformations.⁵ Since its inception, SMSXXI has expanded the benefits for children progressively and was rolled out steadily throughout the country. Currently, there are 5.7 million under-fives affiliated with Seguro Popular through SMSXXI,⁶ and the demand is on the rise, since the fertility rate in Mexico is 2.2 births per woman, and every year 2.3 million children are born, almost half of whom require being affiliated with Seguro Popular.

Seguro Popular, which includes SMSXXI, aims at facilitating access and decreasing the risk of impoverishment to vulnerable populations. Different evaluations on the effect of Seguro Popular on out-of-pocket (OOP) health-related expenditures have shown that Seguro Popular has been successful at strengthening financial protection.⁷ Also, to the best of our knowledge, there is only one study that assessed the effect of Seguro Popular on infant mortality over the first five years of program roll-out. This study used mothers' self-reported mortalities from the country's 2010 census microdata. The results were encouraging, the risk of a child dying in the first month of life was reduced by close to 5 out of 1,000 (or 0.5%) for the population at large and by around 7 out of 1,000 (0.7%) for the program's target population.⁸

The primary objectives of this study were to analyze the impact of SMSXXI on neonatal mortality rates, estimate its effects on out of pocket expenditures of families with under-fives, and, since nowadays there are school-age children that were affiliated with SMSXXI as infants, to determine its long-term effects on their health status.

II. DATA AND METHODS

We briefly describe the data used and the statistical analysis of the impact of the SMSXXI on different outcomes. For more details about methods, equations, and robustness tests see Web Appendix B. We use a difference-in-differences estimation (or triple differences in some cases) that takes advantage of the geographical and time variation of the roll out of the SMSXXI. This strategy compares outcomes over time for treated and untreated units (e.g., children, households, geographical areas) using time series data for several years before and after the program, and controls for underlying changes between treated and non-treated units that are fixed over time as well as for time trends in outcomes that are common across units of analysis. We implement several robustness tests that are related to model specification, data management, and statistical assumptions.

We reconstruct the program's rollout across time in Mexico, using administrative data supplied by the *Comisión Nacional de Protección Social en Salud* (CNPSS) that contain a complete registry of reimbursement requests originated from hospitals that signed a collaboration agreement to be financed by the SMSXXI. We cross-reference these data with the list of healthcare establishments and construct the history of agreements within each health jurisdiction in Mexico.^e We define a health jurisdiction as being treated by the SMSXXI if at least one of their hospitals had signed a collaboration agreement with CNPSS in a particular year. Figure 1 shows the percentage of the population under five years old covered by the SMSXXI for years 2005 to 2014. Most of the program's rollout occurs during 2007 through 2009, the first three

^e Jurisdictions are a sub-state territorial unit used to organize the provision of health care services at different levels.

years of operation, with nearly 80% of the target population being covered by 2009, and approximately 90% of the population covered by 2014.

To analyze out of pocket expenditures (OPE), we use the *Encuesta Nacional de Ingresos y Gastos de los Hogares* (ENIGH), a cross sectional nationally representative survey implemented each two years since 2002, that contains detailed information about households' health expenditures. It contains information on households' municipality of residence, which allows us to compare households across treated and non-treated municipalities for several years before and after the SMSXXI was implemented.

To analyze changes in hospital resources we use the *Subsistema de Información de Equipamiento, Recursos Humanos e Infraestructura para la Salud* (SINERHIAS), gathered by Secretary of Health in Mexico (SSM). These data collect information for all public healthcare provision units from 2001 to 2014 on a yearly basis on medical equipment, human and physical resources and materials available to medical units. We use this dataset to construct the following investments indicators in numbers per 1,000 live births^f in a particular year: (i) permanent hospitalization beds, (ii) temporary hospitalization beds, (iii) incubators and cribs, (iv) general medical doctors in contact with patients, (v) specialists in contact with patients, (vi) other medical and non-medical personnel.

We also draw data on hospitalization discharges from the *Sistema Automatizado de Egresos Hospitalarios* (SAEH) collected by SSM. These data contain hospital discharges from all public hospitals in Mexico for years 2005^g to 2014, with information on age at admission, date of admission, date of discharge, reason for discharge, admission diagnosis (ICD-10 code), and patients' place of residency. We construct the rate of hospital discharges for conditions

^f Births are reported by the *Instituto Nacional de Estadística y Geografía* (INEGI).

^g Data for discharges occurring in previous years exists, but those datasets do not correctly register the patient's age in terms of month and days. Hence, we only discharge data starting in 2005.

related to the SMSXXI as the number of hospital discharges that occur during the first week, first month and first year of life per 1,000 live births for each birth cohort of children. We group the data by patient's year of birth and jurisdiction of residence. We implement a triple difference in difference model where we not only use the variation provided by the geographical rollout of the program but also the variation in conditions covered by the SMSXXI as these were phased-in at different times. This strategy is robust to underlying differences related to combinations of health conditions and jurisdiction over time, i.e. lack of neonatal treatment units in specific areas. To analyze the effect of SMSXXI on the quality of services provided by healthcare units, we use the same data to construct the probability of death at birth, birth weight, frequency of C-sections, the rate of obstetric complications in the puerperal period (ICD-10 codes O85–O92), the likelihood of suffering infections during a hospital stay and the likelihood of being discharged due to disease. Additionally, as a placebo test we analyze discharges related to traumatic injuries, poisoning and other external causes (ICD-10 codes T and S).

We also use data from death certificates registered by INEGI for years 2001 to 2014 to study child mortality at the first week, first month and first year of life. These records include date of birth, which allows us to follow year-of-birth cohorts. The records also include the cause of mortality, defined by ICD-10 codes and place of residence. Using this information, we construct mortality rates for the SMSXXI conditions for each year-of-birth cohort, jurisdiction, and life period. Similar to the analysis for hospital discharges, we implement a triple difference in differences analysis.

To estimate effects on long run health outcomes we study height for age-z-scores using the *Registro Nacional de Talla y Peso* (RNPT) for year 2015. These data includes measurements for height and weight of all children in primary school in Mexico (ages six to twelve years), and

contains information on over 12 million children, 90% of the target population. We study the effects of the SMSXXI on children's height years after the program was implemented and years after children become ineligible. We use detailed information on date of birth of children and place of residence to assign different levels of program exposure during their first year of life. As an example, children born before January of 2007 were never exposed to the program due to the age eligibility rule. Children born, for instance, in September of year 2007 were exposed to the 2007 treatment rollout rate within their state for their first four months of life and to the 2008 treatment rollout rate for the next 8 months of life. As such, the treatment variable is a weighted average of treatment intensity that varies with the children date of birth. We control for state fixed effects, full interactions of age in months and sex and time binary indicators.

III. RESULTS

One of the main goals of the SMSXXI is to reduce the financial burden of illness to beneficiary households as health events covered by the program can push households into poverty if they remain uninsured. Here, we define a catastrophic expenditure if it exceeds 10% of a household's income. Column 1 in Table 1 shows that the program reduced the probability of a catastrophic OPE by 0.11 (95% CI: 0.5 – 1.6) percentage points; which corresponds to a 15.6% decrease with respect to this same statistic in years before the implementation of the program. The ENIGH also allows to disaggregate the type of OPE by source. Column 2 shows that there is a 0.7 (0.2 – 1.1) percentage point decline in the probability of a catastrophic OPE unrelated to pregnancy and childbirth, which corresponds to a relative decline of 14.6%. The next column shows that the probability of catastrophic OPE related to pregnancy and childbirth care falls by 0.3 (0.1 – 0.5) percentage points or 25% in relative terms. The larger effect for the latter source of OPE is

consistent with the design of the SMSXXI as insurance for neo-natal health conditions. In addition, the results show that the program did not change OPE for the non-eligible population (first row in Table 4), confirming that the results found for the eligible population are not due to a spurious correlation between the implementation of the program and trends in OPE. We also analyze the sensitivity of the results to changes in the geographic level of the treatment variable, changes to the definition of the outcome variable and to the inclusion of household characteristics to assess biases due to changes in the composition of households over time across municipalities. Our results in the Web Appendix D show that the effects of the SMSXXI remain robust to all these specifications. The reductions in OPE as the SMSXXI becomes available across the country evidences the effectiveness of the program as an insurance as it reduced the burden of health expenditures for eligible households.

Next, we analyze whether the SMSXXI generated changes in the type of investments from hospitals. Table 2 shows that the arrival of SMSXXI to a health jurisdiction is associated with an increase of 1.3 (.18 – 2.3) permanent hospital beds per 1,000 live births and an increase of 2.5 (1.5 – 3.4) temporary hospital beds per 1,000 live births; which represent increases of 8.3 and 14.4% with respect to pre-SMXXI levels. The program also increased by 0.7 (0.4 – 1.1) incubators and cribs, 1.9 (0.6 – 3.2) specialists and 6.6 (-0.1 – 13.3) staff members per 1,000 live births. These estimates correspond to increases of 15.1, 9 and 7.4% with respect to pre-treatment levels, while there are no significant changes in the number of general physicians. The results confirm that financial incentives provided by the program to states and their hospitals worked as they invested in better infrastructure and medical specialists in order to sign agreements with SMSXXI. Next, we study whether these investments translated into more access, better service quality and improvements in health outcomes.

Table 3 shows that there are no significant changes in the hospitalization rates for conditions that were included in the SMSXXI for any life period of analysis. The results are consistent with at least three mechanisms related to the implementation of the program that produce null results. First, SMSXXI may have only changed the frequency of referrals to other health units and not overall hospitalizations as the program promotes hospitals to invest in the necessary equipment and human resources to attend patients with SMSXXI conditions. Second, the SMSXXI guarantees access to the different pathologies that it covers by guaranteeing financial coverage but it also promotes better primary care attention as part if its resources were destined to investments in primary care. Access affects of SMSXXI coverage (i.e., increase in hospitalization admissions) may in part be offset by efficiency effects of primary care (reduce avoidable hospitalizations). Finally, public hospitals in the country do not deny access if households are not covered by insurance and so there should be no change in the flow of hospitalizations.

Table 4 shows the effects of the SMSXXI on different proxies related to quality of birth delivery. The results show that SMSXXI has no impact on the probability that a child was born alive, no impact on average birth weight and no impacts on the likelihood of requiring a caesarean section during childbirth. Table 5 shows the effects of the program on quality proxies related to hospital admissions for children under five years old, and shows that the SMSXXI had no impact in the probability of suffering an infection during hospital stay or being death at discharge. Despite this, Table 6 shows that the program has large effects in the discharge rate due to post-partum complications defined by ICD codes O85–O92, where the SMSXXI reduces such rate by 0.6 (0.1 - 1.1), which corresponds to a 38% decrease relative to pre-program averages. Columns 2 and 3 show that the discharge rate due to external causes, which we use as a falsification test, are not

affected by the program. While the results show no improvements in conventional measures of quality, such as birth weight or C-sections, they show large effects in conditions that are directly related to the program and that may be explained in part by the larger rate of specialists available in health jurisdictions shown in Table 2.

We next study whether larger investments in quality translated into better health outcomes. Table 7 shows the effects of the SMSXXI on mortality rates at different periods in life. The first column shows that mortality during the first week of life related to conditions covered by the SMSXXI does not change with the implementation of the program. In Column 2, however the results show that the SMSXXI has a significant impact on the mortality rate associated to these same conditions during the first month of life. The program reduces mortality rate per 1,000 live births during the first month of life by 0.14 (0.03 - 0.2) deaths per 1,000 live births. This represents a 7% decrease in mortality due to causes covered by the SMSXXI. Likewise, mortality for the first year of life decreases by 0.14 (0.02 – 0.3) deaths per 1,000 live births. The mortality rates that we construct are cumulative over time because due to data limitations we are not able to compute the exact population at risk as our denominator. Hence the results show that the effect on mortality are concentrated around days 8 to 28 of age, which is the period that the program was designed to affect the largest. As the SMSXXI works as a universal health insurance for the population that is not affiliated to the social security system, we expect that the effects are larger for the population that is most vulnerable. To analyze this hypothesis we divide health jurisdictions of the country in two groups according to their pre-SMSXXI mortality rates: above and below the national median mortality rate. Table 8 shows that most of the reduction in mortality comes from jurisdictions with a higher level of initial mortality. In particular, SMSXXI lowers mortality during the first month by 0.18 (0.03 –

0.3) and during the first year by 0.2 (0.04 – 0.4) in jurisdictions with above-median mortality, while SMSXXI has no significant impacts on the other group of jurisdictions. We next study whether health effects remain in the longer run and estimate the effects of the SMSXXI rollout on the height of children.

Table 9 shows that a ten-percentage point increase in the rollout of the program during a child's first year of life increases height-for-age z-score by 0.0087 (0.0081 - 0.0093) standard deviations. To understand the absolute magnitude of this effect we comment the results for the sample average. Children exposed to the average enrollment rate (60%) during their first year of life experienced an increase of 0.052 (0.047 – 0.056) standard deviations in their height-for-age score with corresponds to 0.43 (0.389 – 0.463) cm in absolute height. The data also allow us to divide the sample into children who attend schools with higher scores of social vulnerability and those with low scores of social vulnerability, which is used as a proxy for socio-economic status. The results in Table X9 show that children in socially vulnerable schools gain 0.018 (0.017 – 0.019) standard deviations in height-for-age for each ten percentage point increase in the rollout of the program in the first year of life. Children in the other group of schools experienced an increase of 0.006 (0.005 – 0.007) standard deviations. This three-fold difference is consistent with the results found on mortality rates, where children who live in more vulnerable areas, those of high mortality and low socio-economic status have benefited the most from the rollout of the SMSXXI.

IV. DISCUSSION

In this paper we study the short term and long-term health effects of the *Seguro Medico Siglo XXI*, a universal health insurance program for children under five years old in Mexico. The program was expanded to every child under five years old born after December 1st of 2006 and whose family was not enrolled in a private insurance program. In addition, the SMSXXI was tailored not only to children under five but it also covered specific diseases or health conditions prevalent in this population. In order to be able to treat the patients and be covered by the Public Insurance institution, hospitals had to engage in investments on infrastructure (e.g., neonatal care units) and human resources (e.g., pediatric specialist) to attend these conditions and be certified by the National Health Secretary, otherwise they would not get full reimbursements for each medical intervention. This financial incentive created an important change in the composition of equipment and number of specialists within hospitals across the country.

Using administrative records we reconstruct the program's rollout across time and space and use differences in differences and triple differences regressions to estimate the programs impacts. Our results show that the program reduced out-of-pocket expenditures by 15.6%, incentivized hospitals to invest in infrastructure and personnel through its certification policy, improved health care quality in some indicators, and reduced mortality at the first month of life by 7% in health conditions covered by the program. We follow cohorts of children exposed at older ages, after the age eligibility limit show that children exposed to the program during their first year of age had higher height-for-age z-scores.

Many of the leading causes of under-five mortality in developing countries such as pneumonia, diarrhea, preterm birth and intrapartum-related complications are avoidable through improving quality and coverage of treatment. Several studies have focused on demand side

incentives, such as Conditional Cash Transfers, to promote better health-seeking behavior in the population.⁹ Other studies have focused on the expansion of public health insurance coverage¹⁰ or the effect of health supply subsidies to lower costs of treatment. However, there are few examples of public health programs that combine demand side and supply side incentives; which have better expected outcomes given the positive complementarity between these. In addition, as countries in the developing world are moving into or discussing the expansion of public health insurance (e.g., *Garantías Explícitas en Salud* in Chile, *Sistema Único de Saúde* in Brazil, National Rural/Urban Health Mission in India) these results offer evidence that expansions improving coverage but also quality of care, can have positive effects on the health of the population.

¹ World Bank. Datos de libre acceso del Banco Mundial. Tasa de Mortalidad Neonatal por 1000 nacidos vivos. <https://datos.bancomundial.org/indicador/SH.DYN.NMRT?view=chart>

² INEGI Población, Hogares y Vivienda. Last Access May 6, 2018. <http://www3.inegi.org.mx/sistemas/temas/default.aspx?s=est&c=17484>

³ UNICEF Data: Monitoring the Situation of Children and Women. Mexico, Key Demographic Indicators. <https://data.unicef.org/country/mex/>

⁴ Doubova S, Josefa-García H, Coronado-Zarco I, Carrera-Muiños S, Cordero-Gonzalez G, Cruz-Reynoso L, Mateos-Sanchez L, Maya-García A, Pérez-Cuevas R. Evaluating the quality of the processes of care and clinical outcomes of premature newborns admitted to neonatal intensive care units in Mexico. *International Journal for Quality in Health Care*, 2018, 1–10 doi: 10.1093/intqhc/mzy061

⁵ Diario Oficial de la Federación ACUERDO por el que se emiten las Reglas de Operación del Programa Seguro Médico Siglo XXI, para el ejercicio fiscal 2016 http://www.dof.gob.mx/nota_detalle.php?codigo=5421511&fecha=28/12/2015

⁶ Comisión Nacional de Protección Social en Salud. Informe de resultados Enero-Junio 2017. http://www.senado.gob.mx/sgsp/gaceta/63/2/2017-08-02-1/assets/documentos/Inf_de_Res_del_SPSS_Ene-Jun_2017.pdf

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Figures

Figure 1: Population under 5 years of age in geographical areas with access to SMSXII

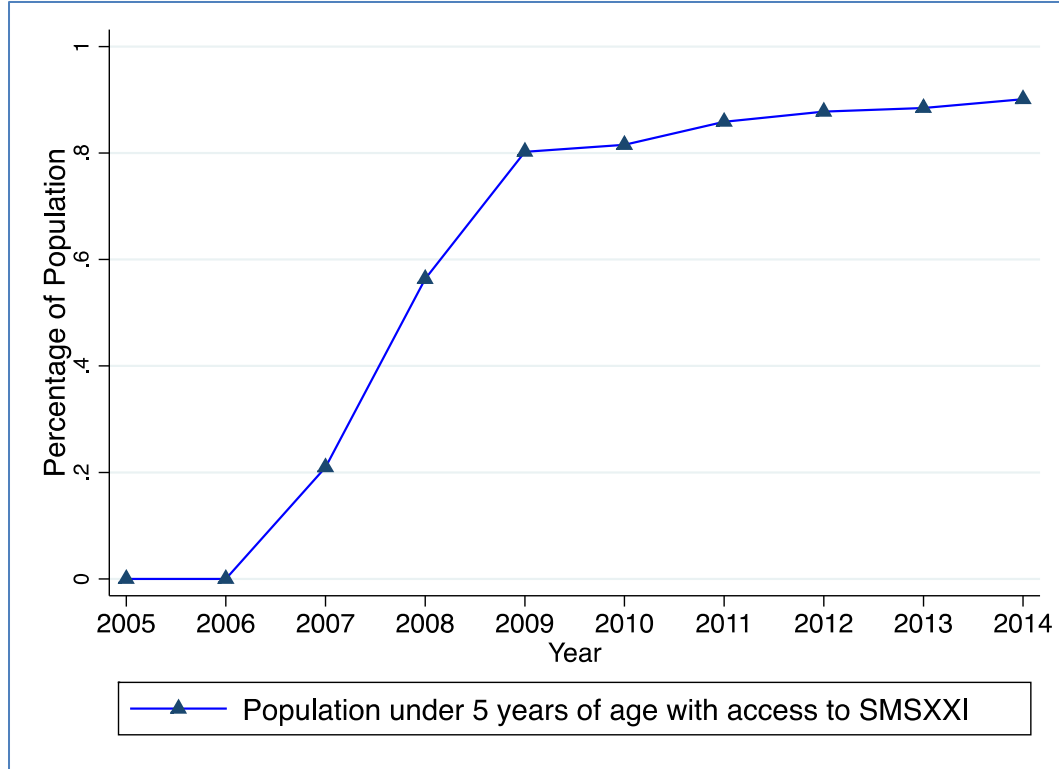


Figure 2 shows SMSXII's coverage for children under 5 years of age in Mexico. The y axis is the percentage of population covered and the x axis is the year of operation. We consider the population treated if they live in a municipality located in a health jurisdiction with at least one hospital who has already signed a collaboration agreement with the program. For population, we use the 2010 Mexican Census, and for treatment status, we use the financial registers provided by the CNPSS.

Tables

Table 1: Effect of SMSXXI on Out-of-Pocket Expenditures

	Pr (Expenditures>10%=1)	Health expenditures as a percentage of income	Pr(Expenditures NPC>10%=1)	Health NPC expenditures as a percentage of income	Pr (Expenditures PC>10%=1)	Health PC expenditures as a percentage of income
	(1)	(2)	(3)	(4)	(5)	(6)
SMSXXI	0.000 (0.004)	-0.001 (0.001)	0.003 (0.003)	-0.001 (0.001)	-0.003 (0.002)	-0.001 (0.001)
SMSXXI * No Soc. Security	-0.011*** (0.003)	-0.003*** (0.001)	-0.007*** (0.002)	-0.002** (0.001)	-0.003** (0.001)	-0.002*** (0.000)
Mean for No Soc. Security pre-2007	0.07	0.031	0.048	0.022	0.012	0.005
Controls	YES	YES	YES	YES	YES	YES
N	239721	239718	239721	239718	239721	239718

Notes: "Encuesta Nacional de Ingresos y Gastos de los Hogares" (ENIGH 2002-2016). This table reports results for the effect of SMSXXI on household's OPE health expenditures. Variable SMSSXI marks the time when the program becomes available at the household's health jurisdiction. The second variable is an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. In Columns 1, 3 and 5, the outcome variable is a dummy indicator which takes the value 1 when the household spends more than 10% of its total income on health expenditures, 0 if less than 10%. In Columns 2, 4 and 6 the outcome is the ratio of health expenditures to total income. NPC refers to non-pregnancy and childbirth expenditures, while PC refers to pregnancy and childbirth expenditures. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the municipality and year level. Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table 2: Impact of SMSXXI on hospital resources per 1000 living births

	Permanent Hospitalization Beds (1)	Non-permanent Hospitalization Beds (2)	Incubators and Cribs (3)	General Physicians (4)	Specialists (5)	Other Staff (6)
SMSXXI	1.262** (0.546)	2.470*** (0.487)	0.743*** (0.162)	-0.130 (0.468)	1.893*** (0.665)	6.632* (3.398)
Mean 2006	15.132	17.133	4.908	12.215	21.022	89.296
N	3388	3388	3388	3388	3388	3388

Notes: This table reports the impact of SMSXXI on hospital resources per 1000 living births. All outcomes count the number of each resource for every column. We use weights in all columns. Our weights are defined as the population under 5 years of age living in each jurisdiction according to the 2010 Mexican Census. Standard errors are clustered at the health jurisdiction level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 3: Impact of SMSXXI on the discharge rate per 1000 living births – SMSXXI conditions

Period of life	First week (2)	First month (4)	First year (6)
SMSXXI	0.179 (0.970)	0.310 (1.075)	0.366 (1.038)
Mean 2006	17.26	18.91	21.11
FE	CT-CE-ET	CT-CE-ET	CT-CE-ET
N	1600	1600	1600

Notes: This table reports results for the impact of SMSXXI on the discharge rate per 1000 living births. Columns report results for the first week, first month and first year of life. We also report the average for each outcome in 2006 (pre-treatment year), and we specify the set of fixed effects employed in each estimation (catalogue-time (CT), catalogue-state (CE), and state-time (ET)). In all models, we use weights at the catalogue-state level, where the weight is equal to the population under 5 years of age in each state interacted with the number of discharges during the first year of life in each state and for each catalogue for pre-treatment years. Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 4: Impact of SMSXXI on quality measures during childbirth

	Living births (1)	Birthweight (2)	Caesarean Sections (3)
SM SXXI	-0.000 (0.001)	-0.880 (4.755)	-0.007 (0.008)
Mean 2006	0.980	3146.831	0.328
N	11890236	11310137	11496702

Notes: This table reports the impact of SMSXXI on the likelihood of a living birth, birthweight and the probability of requiring a caesarean section. In columns 1 and 3 outcome variables are dummy indicator which take the value 1 when the event indicated occurs. Column 2 uses birthweight in grams as the outcome. In all estimates, we control for age of the mother and weeks of gestation, using fixed effects for each level of these variables. We include fixed effects at the state and year level. Standard errors are clustered at the health jurisdiction level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 5: Impact of SMSXXI on quality of service
at the hospital level

	Infections (1)	Discharge due to decease (2)
SM SXXI	0.004 (0.003)	0.005 (0.004)
Mean 2006	0.013	0.062
N	495874	549237

Notes: This table reports the impact of SMSXXI on the likelihood of reporting an infection during hospital stay and being discharged due to patient death. In both columns, outcome variables are dummy indicator which take the value 1 when the event indicated occurs. We include fixed effects at the state and year level. Standard errors are clustered at the health jurisdiction level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 6: Impact of SMSXXI on post-partum complications and placebo outcomes

	Puerperal Complications (1)	T-Codes (3)	S-Codes (4)
SM SXXI	-0.573** (0.252)	-0.025 (0.034)	-0.047 (0.086)
Mean 2006	1.528	0.419	1.224
N	448	448	448

Notes: This table presents the impact of SMSXXI on the discharge rate for puerperal complications and external causes. Column 1 weights observations using the population of women in fertile age in each state according to the 2010 Mexican Census. Columns 2 and 3 weight the observations by total population in each state according to the 2010 Mexican Census. Standard errors are clustered at the state level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Impact of SMSXXI on Mortality rate per 1000 living births – SMSXXI conditions

Period of life	First week (1)	First month (2)	First year (3)
SMSXXI	-0.023 (0.028)	-0.139** (0.055)	-0.146** (0.064)
Mean 2006	0.83	1.98	2.73
FE	CT-CJ-JT	CT-CJ-JT	CT-CJ-JT
N	16940	16940	16940

Notes: This table presents the impact of SMSSXI on the mortality rate per 1000 living births. Columns 1, 2 and 3 present results for the first week, month and year of life respectively. We report the average mortality rate for each period of life for year 2006 (pre-treatment year), and we detail the set of fixed effects employed in each model (catalogue-time (CT), catalogue-jurisdiction (CJ), and jurisdiction-time (JT)). In all models, we use weights at the catalogue-jurisdiction level. Weights are equal to the population under 5 years of age in each state interacted with the number of mortalities during the first year of life for each jurisdiction and each catalogue in pre-treatment years. Standard errors are clustered at the health jurisdiction level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 8: Heterogeneous Impacts of SMSXXI on mortality rates – SMSXXI conditions

Period of life	High Initial Mortality			Low Initial Mortality		
	First week (1)	First month (2)	First year (3)	First week (4)	First month (5)	First year (6)
SMSXXI	-0.03 -0.039	-0.182** -0.076	-0.213** -0.087	-0.01 -0.032	-0.054 -0.063	-0.016 -0.058
Mean 2006	0.969	2.325	3.262	0.688	1.618	2.189
FE	CT-CJ-JT	CT-CJ-JT	CT-CJ-JT	CT-CJ-JT	CT-CJ-JT	CT-CJ-JT
N	8470	8470	8470	8470	8470	8470

Notes: This table presents the impact of SMSSXI on the mortality rate per 1000 living births, disaggregating between jurisdictions with low and high initial mortality levels. We define initial mortality levels to be high or low depending if they are above or below median mortality, calculates for all possible conditions over pre-treatment years (2001-2006). First three columns present impacts for the first week, month and year of life on high initial mortality jurisdictions, and the following three report impacts for the low mortality jurisdictions. We also report average mortality for each period of life and initial mortality level in 2006 (pre-treatment year), and we detail the set of fixed effects (catalogue-time (CT), catalogue-jurisdiction (CJ), and jurisdiction-time (JT)). In all models, we use weights at the catalogue-jurisdiction level. Weights are equal to the population under 5 years of age in each state interacted with the number of mortalities during the first year of life for each jurisdiction and catalogue. Standard errors are clustered at the jurisdiction level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table 9: Impact of SMSXXI on height z-score

Sample	Full Sample (1)	High Marginalization (2)	Low Marginalization (3)
SMSXXI	0.087*** (0.003)	0.181*** (0.006)	0.059*** (0.003)
σ Control Group	8.271	8.353	8.012
Size Effect (in cm.)	0.719	1.511	0.472
FE	T-AS-E	T-AS-E	T-AS-E
N	9699756	2344461	7355295

Notes: This table presents results for the impact of SMSXXI on standardized height, taking the Growth Reference Pattern Study (2006) as the standardization. In all models, we include fixed effects for the year of birth (T), state of residence (E) and the full set of interactions between the age in months and sex (AS). Standard errors are clustered at the school level. Standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

WEB-APPENDIX

Appendix A: Description of the SMSXXI

SMSXXI is funded and regulated by a central authority, the “*Comisión Nacional de Protección Social en Salud*” (CNPSS). Funding from the CNPSS is transferred to the state-level health authorities, “*Regimen Estatal de Protección Social en Salud*” (REPS), who then decide in which way to spend the money. Funding is assigned based on two criteria: (i) states are assigned a single transfer of 210 MXP for every child enrolled into the program for the first time, and (ii) a payment for every medical service provided, conditional on the service being part of the official list of covered conditions for the year⁸. The enrollment transfer (called “*cápita*”) is meant to increase capacity in the primary care system to attend the increased demand for services coming from newly-enrolled families, specially from newborns. The service-based payment refers to secondary and tertiary care services, which are not included in the general services catalogue (CAUSES) or the catastrophic expenditures catalogue. This dual financing schemes implies that health providers have incentives to enroll as many children as possible into the program, and to attend patients for conditions included in the official coverage list.

Enrollment-based funding does not include any other conditions other than affiliation. In contrast, a necessary condition for access to the service-based payments of SMSXXI is having a valid collaboration agreement with CNPSS. Having solely a collaboration agreement entitles the provider to half of the rate specified by the CNPSS for specific services. Full rates are paid only to healthcare units which, in addition to signing an agreement, have been certified by the CNPSS. To receive a certification, the unit must prove that they have the capacity to attend high

⁸ The list of covered conditions is defined in the program’s “*Reglas de Operación*” (ROP), which is a law enacted by the Mexican Congress on an annual basis.

complexity conditions at the neonatal and infant level. This implies having both physical and human resources available (birth rooms, incubators, neonatal specialists and surgeons, intensive care units, etc...).

In terms of how states operate in this scheme, affiliation is relatively straightforward. All Mexican children born after December 1st, 2006, are eligible for affiliation to SMSXXI, so long as they are not enrolled in a Social Security institution, that is, so long as their parents are not formally employed in either the private or public sector.

The service-based payments work according to the official list of covered conditions. Health problems included in this list consider tumors, respiratory diseases, infections related to the perinatal period and traumatic injuries, among others. These account for nearly 32% percent of hospital discharges for children under one year old, and approximately 21% of the infant mortality rate. These services are reimbursed to the state level authorities each time they attend an affiliated child, so long as the attention was provided at a health care facility with a valid collaboration agreement (50% of the rate) and certification (100% of the rate). The amount paid for each one of these interventions is determined annually by the CNPSS. Additionally, SMSXXI also provides funding for high cost treatments which are not included in the FPGC, including but not limited to: auditory sieve, cochlear implants, self-care community workshops and milk banks.

Finally, financial resources assigned for SMSXXI are earmarked, as are all transfers stemming from the CNPSS for public health expenditures. According to the guidelines provided by the CNPSS⁹, assigned funds must be spent approximately in the following proportions: (i) at most 40% will be assigned to remunerations for personnel directly involved in the provision of

⁹ These guidelines are published by the CNPSS on an annual basis, under the name “*Anexo IV*”.

medical services, (ii) at most 30% will be spent in medication, curative material and other physical resources necessary for service provision, and (iii) no less than 20% of funding will be spent on preventive actions¹⁰.

¹⁰ These spending percentages may vary year to year and between states, but they are usually close to the numbers here presented for all states and years. Specifically, we present the percentages established by the CNPSS for 2008. (Downloaded May 22, 2018, from the following link: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwj8i7vM3ZrbAhUGI5AKHXaJBhYQFghCMAM&url=http%3A%2F%2Fpromocion.salud.gob.mx%2Fdgps%2Finterior1%2Fprogramas%2Fdengue_08%2FDengue_2008%2F5_Anexo_IV%2F1_Lineamientos_Anexo_IV.doc&usg=AOvVaw2X0sOaVDTHqHUGehDcO8Sf)

Appendix B: Full Description of Data Sources and Estimation Methods

In this section, we describe the data sources used, the empirical methodology and regression specifications for all results in the main section and robustness tests. We rely on several data sources to evaluate the impact of SMSXXI, both from administrative sources and surveys. Our sources are: (i) SMSXXI's *Reglas de Operación* (ROP), which detail the full catalogue of conditions covered by the program for each year of operation; (ii) hospital discharge records coming from all publicly administrated hospitals, gathered by *Secretaría de Salud* (SS); (iii) the national registry of birth certificates, gathered by *Instituto Nacional de Estadística y Geografía* (INEGI); (iv) population projections, estimated by *Consejo Nacional de Población* (CONAPO); (v) the national registry of death certificates, published by INEGI; (vi) *Encuesta Nacional de Ingresos y Gastos de los Hogares* (ENIGH), a nationally representative survey on household's income and expenditures; (vii) administrative data from the adjunct direction of SMSXXI; (viii) lists of healthcare provision establishments, by SS; (ix) *Encuesta Nacional de Ocupación y Empleo* (ENOE), a nationally representative survey on household occupation and labor; (x) population data from the 2010 Mexican Census, and (xi) *Registro Nacional de Talla y Peso* (RNPT), a national census of anthropometric measurements for primary school students.

The structure of this section is as follows: we describe each data source, how we employ the acquired data, descriptive statistics of the corresponding sample and outcomes when corresponding, the empirical methodology used for estimating treatment effects and the necessary assumptions, specifications, supplementary analyses and robustness exercises for each outcome.

Conditions Catalogues

SMSXXI offers financial coverage for specific health conditions, with emphasis on those conditions more common to newborns and infants (under 5 years of age). The program's ROP are published every year since 2007. The ROP provide a full list of covered conditions, detailing both the ICD-10 code of the covered condition and the amount to be paid back to the service provider for the attention. Table Y1 reports the number of conditions included in each conditions' catalogue for years 2007 to 2013, the last year where a catalogue included new conditions and for which we have data available (hospital discharges and mortality). Column 4 details how the number of conditions included in each catalogue has increased for almost every year of the program. This implies that the complete set conditions that comprise the final coverage list has been incorporated into the program in a staggered manner. While in 2007, 108 different conditions were covered, coverage expanded in the following years, adding 8 new conditions in 2009, 21 in 2010, 3 in 2012 and 9 in 2013.

Based on this information, we define 5 catalogue groups (column 6), comprising years 2007, 2009, 2010, 2012 and 2013. We disregard years 2008 and 2011, as no new conditions were included in the ROPs of those years. Also, it is important note that, by definition, those medical conditions which never enter SMSXXI's coverage are not counted in any group. This staggered entry into the program's coverage provides a source of exogenous variation in the time of entry into the program. We exploit this variation in our estimations of the effects on discharge and mortality rates. The staggered inclusion of conditions into SMSXXI's coverage allow us to compare indicators such as the discharge rate or mortality across time, by comparing the indicators for conditions already included in the program's coverage with conditions that have yet to be included into the program.

Access to Seguro Popular: Families with access to SMSXXI

We use data from the 2009 Extended version of ENOE, a nationally representative survey on labor and occupation outcomes at the individual and household level. We use this survey to study the effect of SMSXXI on affiliation to SP, Mexico's universal health insurance scheme. For SMSXXI, only children born after December 1st, 2006 are eligible for affiliation. Affiliation of a child to SMSXXI allows the child's family to enrol into SP as an additional benefit. This generates a complementarity between both programs, and it implies that potential effects on the outcomes studied in this paper may be attributed to both SMSXXI and SP.

To estimate the effect of having a child eligible for SMSXXI on the likelihood of being affiliated to SP, we use a Regression Discontinuity Design (RDD). In this design, we compare the individuals' affiliation status to SP between households where there is an eligible child and households where no children are eligible based on the date of birth eligibility rule. We compare households where the child is only just eligible, that is, when his/her date of birth is extremely close but after the cut-off date, with households where the child is only just ineligible, that, when his/her date of birth is close and before the cut-off date.

Figure 1 presents a graphical representation of this analysis. The horizontal axis is the date of birth of a household's youngest child in the ENOE survey. The vertical axis is the percentage of households affiliated to SP. The vertical line in the middle of the figure represents the cut-off date of December 1st, 2006. Each data point represents the average affiliation of households' according to their children's date of birth (households are grouped every 30 days). The figure shows that households where the youngest child was born on or after the cut-off date are more likely to be affiliated to SP. The estimated difference is approximately 8 percentage

points on the likelihood of affiliation to SP when having a child eligible for SMSXXI. Considering that average affiliation of non-eligible households is around 18%, SMSXXI causes an increase of roughly 40% in affiliation to SP for eligible households.

Administrative Data (CNPSS)

We use administrative data supplied by the CNPSS to identify the program's rollout across geographical zones of Mexico. We use the registry of *Declaratorias*, which are reimbursement requests originated from hospitals which have already signed a collaboration agreement with CNPSS. Data from 2009 to 2016 is automatically gathered and reported by the automatic reimbursement request's system operated by CNPSS. Before 2009, the system had yet to be set up, so for years 2007 to 2009 we rely on financial registries. These registries indicate which hospitals were reimbursed for their services provided during the first two years of operation (2007-2008). Information coming from the automatic system is kept at the hospital discharge level, including data on the condition that generated the discharge, hospital admission and discharge dates, the location and the unique identifier of the hospital that provided the service. The financial registries for years 2007-2008 are aggregated at the hospital level and include the hospital state and name. This dataset allows us to establish which hospitals had already signed a collaboration agreement with the CNPSS, as reimbursement is only available for hospitals which already signed the agreement.

We use this dataset of reimbursements to identify which areas of the country already had a hospital included in the program for every year of operation. We cross-reference our reimbursements database with the SS list of healthcare provision establishments. We reconstruct the history of collaboration agreements for each health jurisdiction in the country (jurisdictions

are a sub-state territorial unit used for health policy purposes). Hence, we assign each health jurisdiction a treatment status for every year of operation, declaring the jurisdiction treated if at least one hospital had already signed a collaboration agreement with CNPSS previously. We use this variation in treatment status across geographical units in our estimates for OPE, hospital discharges, quality of service provision, child mortality and anthropometric measurements.

Hereon, we provide descriptive statistics of the geographical rollout of SMSXXI at the municipality and health jurisdiction level. Based on the payments and reimbursements data, we describe the rollout by municipality in Table Y2. The table reveals that during its first year of operation (2007), 13.5% of Mexico's municipalities were in health jurisdictions that had at least one hospital with a collaboration agreement. Most of the municipalities acquire coverage during the first three years of the program. By 2009, 76.7% of the country's municipalities already had access to the program by way of a hospital with an agreement in their health jurisdiction. It is also worth noting that, by the end of 2014, approximately 12% of the country's municipalities remains without access to SMSXXI on their respective health jurisdiction.

In addition to Table Y2, we present graphical evidence of the staggered rollout of the program across time. Figure 2 presents the percentage of population under 5 years of age living in jurisdictions with access to a hospital with SMSXXI available. For this calculation, we use the population data provided by the 2010 Mexican Census at the municipality level, assigning each municipality its respective health jurisdiction and calculating for each year the population under 5 years of age living in treated areas. Figure 2 paints a similar picture to Table Y2: most of the program's rollout occurs during the first three years of operation. By 2009, nearly 80% of the Mexico's infant population lives in municipalities with access to the program, and by 2014 only about 10% of the population remains without access to the program.

This descriptive analysis suggests that SMSXXI's rollout was not immediate, but rather that jurisdictions were rolled into the program in a staggered manner. This geographical variation in the program's availability will provide with us with an exogenous source of variation to exploit in our impact estimations.

Out of Pocket Expenditures

To analyse the effects on household's out of pocket expenditures (OPE), we use data from the ENIGH. The ENIGH collects information on income and expenditures at the household level, and is representative at the national and urban/rural level. It is available every two years, from 2002 to 2016, and exceptionally for 2005 as well. For our impact analysis, we use the following pre-coded variables of health expenditures: (i) total health expenditures during the last three months, (ii) total health expenditures on primary care and secondary care for conditions not related to pregnancy and childbirth, and (iii) total health expenditures on secondary care for conditions related to pregnancy and childbirth. Additionally, for each of these expenditure categories we define two outcome variables: (a) health expenditures as a percentage of total income, and (b) a dummy indicator which takes the value 1 when health expenditures exceed 10% of total income. Hence, we are left with six outcome variables for health expenditures, depending on whether the variable is continuous or discrete, and if health expenditures considered are total expenditures, primary and non-pregnancy and non- childbirth secondary care, and pregnancy and childbirth secondary care. Outcome variables for expenditures are defined in the following way:

$$G_{ht}^A = \frac{\text{Health expenditures}_{ht}}{\text{Total income}_{ht}}$$

$$G_{ht}^A = \mathbf{1} \left(\frac{\text{Health expenditures}_{ht}}{\text{Total income}_{ht}} > 10\% \right)$$

Here, variable (1) is a continuous variable which indicates the percentage of the household's total income spent on health products and services for household h in year t , and variable (2) is a discrete indicator which takes the value 1 when household h in year t spends more than 10% of its total income in health products and services. The superscript A indicates if the health expenditure concept is total health spending, primary and secondary care excluding pregnancy and childbirth, or secondary care for pregnancy and childbirth.

Hereon we provide descriptive statistics of the households considered in the ENIGH panel dataset. Table Y3 presents descriptive statistics for the main socioeconomic variables of the households. In this table, we consider only households without access to social security, our population of interest. For each year of the ENIGH survey, we report the mean and standard error (in parentheses) of each variable. The first three rows of Table Y3 describe the educational attainment for the head of household. Between 80 to 90% of heads attended primary education, 33 to 36% went to secondary schooling, and only 7 to 8% assisted to higher education. The trend shows that access to primary and secondary schooling has been rising throughout the years, but access to higher education has remained roughly the same for heads of households without access to social security. Average age for the head is around 46-47 years for all years of the ENIGH survey, and size of household is slightly below 4, ranging between 3.58 to 4.04 members. Lastly, each household has, on average, one member under 12 years of age.

Next, we present a descriptive analysis of the probability of health expenditures. We show graphical evidence for the likelihood of spending over 10% of the household's total income on all health expenditures, separating the sample by access to social security. The figure shows that

households without access to social security have a higher likelihood of spending over 10% of their income on health for all years. On 2008, we can see a drop of approximately 3 percentage points in the likelihood of spending for households without social security. This trend continues until 2016, reaching a minimum of 4% for that year. As a companion analysis, Figure 4 shows the likelihood of spending over 10% of income conditional on health expenditures being higher than zero. This graph shows that the probability of spending a significant portion of the household's income has lowered significantly ever since the start of SMSXXI. In all, this graphical evidence suggests that the likelihood of incurring in health expenditures has decreased for households without access to social security, and the timing seems to coincide with the implementation of SMSXXI.

Next, we turn to the empirical methodologies and regression specifications of our results on OPE. To estimate the impact of having access to SMSXXI's coverage on household's out-of-pocket expenditures in healthcare, we employ a differences-in-differences strategy (DD, or double diff for short). This strategy allows us to estimate the causal effect of SMSXXI under the assumption of parallel trends in the absence of treatment, that is, that there are no statistical differences in trends for outcomes under the counterfactual scenario of no treatment for all units. Hereon, we present specifications for DD models at the municipality and state level separately. Equation (1.1) describes our main specification at the municipality level:

$$Y_{mht} = \beta * Coverage_{mt} + X_{ht} + \phi_m + \eta_t + \varepsilon_{mht}$$

In equation (1.1), m indexes municipalities, h indexes households, and t indexes years. Y_{mht} is the outcome of interest, which may be: (i) a dummy variable indicating if health expenditures exceed 10% of household's total income, or (ii) the ratio between the household's health

expenditures and its total income. $Coverage_{mt}$ is a dummy variable which indicates if municipality m is in a health jurisdiction where at least one hospital has already established a collaboration agreement with CNPSS for year t . We include year fixed effects to control for nationwide shocks for each year t , and municipality fixed effects to control for pre-existing differences between municipalities m . We also include control variables for each household h in each year t such as age of the head of household, number of household members and the number of men in each household. Standard errors are clustered at the jurisdiction level, and are represented by ε_{mht} . In all models using this specification, we weight observations using the survey weights included in the ENIGH datasets.

As an alternative to the previous specification, we estimate a DD model at the state level. This specification is as follows:

$$Y_{eht} = \beta * Coverage_{et} + X_{ht} + \phi_e + \eta_t + \varepsilon_{eht}$$

In Equation (1.2), e indexes states, h indexes households and t indexes years. Y is the outcome of interest, which may be either the dummy variable at the 10% threshold or the ratio between health expenditures and total income. Here, the variable $Coverage_{et}$ is a continuous variable equal to the percentage of population under 5 years of age living in municipalities which are already covered by SMSXXI, for each state e in year t . We include year fixed effects to control for nationwide shocks for each year t , and state fixed effects to control for pre-existing differences between states e . We also include control variables for each household h in each year t such as age of the head of household, number of household members and the number of men in each household. Standard errors are clustered at the jurisdiction level, and are represented by

ε_{eht} . In all models using this specification, we weight observations using the sampling weights included in the ENIGH datasets.

In addition to the previous specifications, we explore heterogeneity of results by household's access to social security. Our models for heterogeneity are as follows:

$$Y_{mht} = \beta * Coverage_{mt} + \delta * Coverage_{mt} * NoSS_{ht} + \gamma * NoSS_{ht} + X_{ht} + \phi_m + \eta_t + \varepsilon_{mht}$$

$$Y_{eht} = \beta * Coverage_{et} + \delta * Coverage_{et} * NoSS_{ht} + \gamma * NoSS_{ht} + X_{ht} + \phi_e + \eta_t + \varepsilon_{eht}$$

Equations (1.3) and (1.4) are identical to the previously specified models, but they also include the variable *No SS* and its interaction with the treatment variables. *No SS* is an indicator variable which equals 1 if no member of household h in period t has access to social security. In these two equations, the coefficient of interest is δ , which represents the effect of SMSXXI in households with no access to social security. As in the previous cases, we cluster standard errors at the jurisdiction level, and we weight observations using the sampling weights provided by the ENIGH.

Finally, we perform a supplementary analysis to check for evidence against the parallel trends assumption. An implication of this assumption is that outcome trends should exhibit no differences in pre-treatment periods, as the program has yet to start. We estimate a similar model to the one specified in equations (1.1) and (1.2), but we set the onset of the program at the municipality and state level in 2001 (program started in 2007). This way, the first pre-treatment year of the program for which we have data (2002) is set as the second year of the program, in the same way as the first post-treatment year for which we have data (2008) is the actual second year of the program. We estimate the models in equations (1.1) and (1.2) on the subsample of

pre-treatment years using our shifted treatment variable to test for differences in trends before the start of the program. As in the main models, we cluster standard errors at the jurisdiction level and use the sampling weights included in ENIGH.

Personnel and Infrastructure

To analyze the availability of hospital resources, we use the “Subsistema de Información de Equipamiento, Recursos Humanos e Infraestructura para la Salud” (SINERHIAS), gathered by SS. This dataset collects information on medical equipment, human and physical resources and materials available to medical units. From this dataset, we draw the following information: (i) number of beds available for hospitalization, (ii) number of medical doctors in contact with patients by specialty, and (iii) physical resources specific to neonatal care (incubators and cribs). The SINERHIAS dataset covers all public healthcare provision units, from 2001 to 2014.

We use this dataset to analyze the availability of hospital resources with respect to the arrival of SMSXXI to each health jurisdiction. Our outcome variable takes the form:

$$y_{jt}^A = \frac{\sum Resources_{jt}^A}{Living\ births_{jt}} * 1000$$

Here, index j indicates a health jurisdiction, index t refers to a year and A refers to a specific resource. Hospital resources in health jurisdiction j in year t for type A may be: (i) permanent hospitalization beds, (ii) temporary hospitalization beds, (iii) incubators and cribs, (iv) general medical doctors in contact with patients, (v) specialists in contact with patients, (vi) other

medical and non-medical personnel. The denominator here is the number of living births in health jurisdiction j in year t , as reported by INEGI.

Next, we describe our specification for the availability of hospital resources, specifically medical personnel and healthcare infrastructure. Equation (1.9) presents our specification:

$$y_{jt} = \beta * SMSXXI_{jt} + \gamma_j + \mu_t + \varepsilon_{jt}$$

In Equation (1.5), j indexes jurisdictions and t indexes years. Outcome y_{jt} is one of six measures of resources: (i) the number of permanent hospitalization beds per 1000 living births, (ii) the number of temporary hospitalization beds per 1000 living births, (iii) the number of incubators and hospital cribs per 1000 living births, (iv) the number of general doctors per 1000 living births, (v) number of specialists per 1000 living births, and, (vi) the number of other types of personnel per 1000 living births. All outcome measures are specific to jurisdiction j in year t . $SMSXXI_{jt}$ is a dummy variable which indicates if jurisdiction j in year t had at least one hospital which had already signed a collaboration agreement with the CNPSS. We include fixed effects at the jurisdiction (γ_j) and time (μ_t) level. Standard errors are clustered at the jurisdiction level and they are represented by ε_{jt} .

For the DD strategy to be valid, we require the parallel trends assumptions to interpret the coefficient of interest as a causal effect. As a supplementary analysis, we perform a falsification exercise in the following manner: we set the rollout of the program (2007-2012) six years behind, during the pre-treatment years (2001-2006), and then we estimate the impact of SMSXXI on the subsample of pre-treatment years (2001-2006). As in the main specification, we cluster standard errors at the jurisdiction level.

Hospital Discharges

We draw our data on discharge records from the “Sistema Automatizado de Egresos Hospitalarios” (SAEH) collected by SS. This dataset is an anonymized database containing hospital discharges from all public hospitals in Mexico, available for years 2005¹¹ to 2014. We define a hospital discharge as a patient’s exit event from hospitalization services, which implies that a permanent hospitalization bed¹² is now vacant. This dataset includes information on age at admission, date of admission, date of discharge, discharge motive (curation, improvement, derivation to other hospital unit, decease, voluntary exit), admission diagnostic registered at the ICD-10 1 letter and 3 digits’ level, and the patient’s residency data (state and municipality).

Using the age and date of admission for each hospital discharge we can study the trends in discharges occurring during the first week, first month and first year of life. For all three periods, we analyse the discharge rate per 1000 living births in the patient’s cohort of birth at the year level. In most of our estimations we group the discharges’ counts at the year and place of residence level (state and municipality). We group the data at the year-of-birth cohort considering the patient’s year of birth.

Based on this data, we count the number of discharges for those conditions included in each catalogue of SMSXXI, for each year-of-birth cohort and state. Using this count, we obtain the discharge rate for every period of life to be analysed (first week, month and year of life).

Therefore, our outcome variable is defined as:

¹¹ Data for discharges occurring in previous years exists, but those datasets do not correctly register the patient’s age in terms of month and days. Hence, we only discharge data starting in 2005.

¹² We draw this definition from “Dirección General de Información en Salud” (DGIS), SS, http://www.dgis.salud.gob.mx/contenidos/basesdedatos/std_egresoshospitalarios.html

$$y_{cet}^A = \frac{\sum Discharge_{cet}^A}{Population_{et}} * 1000$$

In this outcome, c indexes an individual catalogue (as detailed in Table 1), e indexes states, t indexes a year-of-birth cohort and A refers to the period of life. The numerator is the number of hospital discharges due to conditions considered in catalogue c , in state e for year-of-birth cohort t during period of life A . The denominator corresponds to the number of births in each state e in year t . For the denominator, we use information from the birth registry kept by INEGI.

We follow by providing descriptive statistics of the discharge rate. Tables Y4 to Y6 report the discharge rate per 1000 living births for each catalogue of conditions, for the first week, first month and first year of life. For pre-treatment years 2005 and 2006, for every 1000 living births in Mexico, approximately 38 newborns required hospitalization during their first week of life. Similarly, 43 children required hospitalization during the first month, and between 63 and 66 during the first year of life. Considering all discharges, around 32% of hospitalizations correspond to conditions covered by SMSXXI. As an example, consider that approximately 2.2 million children were born in Mexico in 2005, which means that there were roughly 165 thousand hospital discharges related to children under 1 year of age. It is also worth noting that most of the conditions in SMSXXI's catalogue were included in the first two catalogue groups (2007-2008 and 2009).

Next, we describe the conditions in SMSXXI catalogue with a graphical analysis, grouping them according to the year in which they were added to the program's coverage. Figures 5, 6 and 7 plot the discharge rate per 1000 living births in deviations from the mean of each catalogue, for the first week, first month and first year of life. The coloured vertical lines mark the year in

which each catalogue enters coverage. Hence, the blue line corresponds to the first year in coverage for the 2007-2008 catalogue group, the red line corresponds to the first year in coverage for the 8 conditions included in 2009, and so on. The series for the first two catalogue groups (2007-2008 and 2009, blue and red respectively) exhibit a noticeable change in trend when entering the program's coverage. When entering coverage, the first catalogue moves from below the mean to 1-2 discharges above the mean, and the second catalogue moves to approximately 1 discharge above the mean. The series for the catalogue group 2010-2011 also shows a slight increase after entering coverage. In all, this graphical evidence suggests that there is an increase in the nationwide discharge rate when the different catalogues enter coverage.

Now we move to the empirical methodology and specifications for discharge rates. To estimate the impact of entering SMSXXI's coverage on hospital discharge rates, we employ a differences-in-differences-in-differences strategy (DDD, or triple diff for short). Equation (1.6) describes our main specification for estimating the effect on SMSXXI's discharge rate per 1000 living births:

$$y_{cet}^A = \tau * (Onset_{cet}) + \phi_{ce} + \phi_{ct} + \phi_{et} + \varepsilon_{cet}$$

In Equation (1.6), c indexes catalogues, e indexes states, and t indexes years of birth. y_{cet}^A is the outcome of interest, which in this specification represents the hospital discharge rate due to conditions covered by catalogue c in state e per 1000 newborns in year t , for life periods A (first week, first month and first year of life). $Onset_{cet}$ is a continuous variable which is the interaction of two variables: (i) a dummy indicator of whether catalogue c in year t is part of SMSXX's list of covered conditions, and (ii) a continuous variable which represents the percentage of children under 5 years of age living in jurisdictions with access to a hospital that has already established a collaboration agreement with the CNPSS, for each state e in each year t . The coefficient of

interest is τ , which represents the average treatment effect of entering SMSXXI's coverage on the discharge rate for conditions of catalogue c in state e . We also include fixed effects to control for time-invariant characteristics of each state-catalogue group (ϕ_{ce}), changes over time in each state (ϕ_{et}) and nationwide changes over time in each catalogue group (ϕ_{ct}). The error term ε_{cet} represents unobserved heterogeneity. We cluster standard errors at the state level. For all models of this specification we apply weights at the catalogue-state (ce) level. Our weights are defined as follows: for each ce combination, we interact (i) the total number of discharges for conditions from catalogue c in each state e during the pre-treatment years (2005-2006), with (ii) the total population of children under 5 years of age in state e according to the 2010 Mexican Census.

As in a difference-in-difference model, identification of a causal effect requires the parallel trends assumption. In a triple diff context, this implies that in the absence of a treatment, trends for each location-catalogue combination would exhibit no differences. In the robustness section, we test for evidence against this assumption with the following falsification exercises. For hospital discharges, our falsification exercise is limited to years 2005-2006 due to the previously discussed data limitations. We set the start of the program at the state e level by using the following rule: we assign the start year 2005 to the 15 states that took up the program for the first time in 2007, and 2006 to the 17 states that took up the program in 2008-2009 (in the Appendix, Table A1 details the start year for each state). For catalogues, we assign 2005 as the start year for the first two catalogues (2007 and 2009), and 2006 for the latter three catalogues (2010, 2012 and 2013). Hence, we assign a treatment status for each catalogue-state (ce) combination using a dummy indicator which interacts the following two indicators: (i) a dummy indicating if catalogue c is already covered in year t according to its falsification start year (2005 for early catalogues, 2006 for late ones), and, (ii) a dummy indicating if state e has already taken the

program in year t according to its falsification start year (2005 for early adopters, 2006 for late adopters). We estimate the triple diff model specified in equation (1.5) with our shifted dummy indicator in the subsample of pre-treatment years (2005-2006). As in the main specification, we use the same set of catalogue-state weights and cluster the standard errors at the state level.

Quality of Service Provision

To analyse the effect of SMSXXI on the quality of services provided by healthcare units, we perform a complementary analysis of quality outcomes. We use the SAEH dataset to construct the following measures of quality in the provision of healthcare: the likelihood of a living birth for products of a birth, birthweight conditional on living birth, the likelihood of requiring a caesarean section, the rate of obstetric complications in the puerperal period, the likelihood of suffering infections during hospital stay and the likelihood of being discharged due to decease. Additionally, to study placebo effects of SMSXXI, we estimate the effect on the discharge rate due to conditions such as traumatic injuries, poisoning and other external causes (ICD-10 codes T and S). We study these outcomes to provide evidence for an increase in quality of service due to the program.

First, our likelihood measures for event outcomes (living birth, caesarean, infection and decease) are as follows:

$$y_i^A = \mathbf{1}(\text{Event}_i^A)$$

Where outcome y_i^A is a dummy variable which takes the value 1 if event A happens for individual i , 0 if it doesn't. Events A may be: (i) a living birth of a birth's product, (ii) requiring a

C-section during childbirth, (iii) suffering an infection during hospital stay, and (iv) being discharged due to decease.

For these measures of service quality, we employ a differences-in-differences strategy to study the effect of SMSXXI on quality outcomes. The following equation describes our empirical specification for the program effect on the likelihood of a living birth and birthweight:

$$y_{net} = \beta * Coverage_{et} + Age_n + Weeks_n + Multiple_n + \psi_e + \omega_t + \varepsilon_{net}$$

In Equation (1.7), n indexes an individual product of the birth, e indexes a state, and t indexes a year of birth. Outcome y_{net} is either: (i) an indicator variable which takes the value 1 if the product of the birth was a living newborn, or (ii) the newborn's birthweight conditional on the product being a living birth. The variable $Coverage_{et}$ equals the percentage of population under 5 years of age living in treated jurisdictions in each state e for year t . Again, we draw this population using the 2010 Mexican Census. The coefficient of interest is β , which represents the effect of SMSXXI's coverage on the outcome. We control for age of newborn's n mother (Age_n), weeks of gestation ($Weeks_n$) and a dummy variable indicating whether the birth was multiple ($Multiple_n$). We also include fixed effects at the state e (ψ_e) and year t (ω_t) level. Standard errors are represented by ε_{net} and they are clustered at the jurisdiction level. The only difference between the model for likelihood of living birth and the model for birthweight is the sample used, as birthweight is calculated only on the subsample of newborns who are born alive. For the likelihood of having a caesarean section, we use the following specification:

$$y_{iet} = \beta * Coverage_{et} + Age_i + Weeks_i + \psi_e + \omega_t + Multiple_i + \varepsilon_{iet}$$

In equation (1.8), indexes e and t are the same as in the previous equation, but in this equation i indexes the mother giving birth. This is the only difference with respect to the model presented in equation (1.7): each observation here represents mother i giving birth in state e in year t , whereas in equation (1.7) each observation is an individual product of the birth. The outcome y_{iet} is an indicator variable which takes the value 1 if the birth required a c-section. As in equation (1.7), we control for age of the mother (Age_i), weeks of gestation ($Weeks_i$) and a dummy variable for multiple births ($Multiple_i$). We add fixed effects for states (ψ_e) and years (ω_t). Errors are represented by ε_{iet} and they are clustered at the jurisdiction level.

Equation (1.9) presents our specification for the effect of SMSXXI on infections during hospital visits and discharges due to decease. We employ this specification for discharges occurring during the first week, first month and first year of life. The specification is as follows:

$$y_{det}^A = \beta * Coverage_{et} + \psi_e + \omega_t + \varepsilon_{det}$$

Here, d indexes an individual discharge from the hospital, e indexes states, and t indexes the year when the discharged person was admitted to the hospital. The outcome variable is y_{det} , which is a dummy variable which takes the value 1 when event A occurs (either an infection during hospital stay or a discharge due to patient's death). $Coverage_{et}$ is a continuous variable representing the percentage of population under 5 years of age living in jurisdictions with access to the program, for each state e in each year t . We also include fixed effects at the state (ψ_e) and time (ω_t) level. Standard errors are clustered at the jurisdiction level and they are represented by ε_{det} .

Next, for obstetric complications during the puerperal period and placebo outcomes, we use the ICD-10 conditions' catalogue and consider conditions which represent complications

during childbirth and the puerperal period. We construct the rate of obstetric complications as follows:

$$y_{et} = \frac{\sum Obstetrics_{et}}{Living\ births_{et}} * 1000$$

Here, our outcome variable y_{et} represents the rate of obstetric complications during the puerperal period per 1000 living births, for each state e in year t . We define obstetric complications as any discharge corresponding to ICD-10 codes O85 to O92. The denominator is defined as the number of births in each state e for year t , and once again we draw this from the INEGI registry.

For our placebo outcome, we define the discharge rate due to external causes per 1000 individuals. These discharges represent hospital admissions due to injuries, wound or other causes outside the body. As external causes are not specific to the neonatal or infant period, but rather affect all ages, we use total population as the denominator for this rate. This outcome takes the form:

$$y_{et} = \frac{\sum Discharge_{et}}{Population_{et}} * 1000$$

Here, the amount of discharges due to external causes is expressed with respect to the entire population of state e in year t . We draw this value from the population projections estimated by CONAPO for years 1990-2030.

Equation (1.10) presents our specification for effect of SMSXXI on the rate of obstetric complications and the rate of discharges due to external causes (CIE-10 codes T and S). The specification is as follows:

$$y_{et} = \beta * Coverage_{et} + \psi_e + \omega_t + \varepsilon_{et}$$

In this equation, e indexes states and t indexes years. Outcome y_{et} may be: (i) the discharge rate due to obstetric complications per 1000 living births, or, (ii) the discharge due to external causes per 1000 people, for each state e in year t . As in the previous specifications, $Coverage_{et}$ is a continuous variable representing the percentage of population under 5 years of age living in treated jurisdictions, for state e in year t . We control for fixed effects at the state (ψ_e) and time (ω_t) level. Errors are represented by ε_{et} and they are clustered at the jurisdiction level.

For all estimates presented in this section, we require the parallel trends assumptions to interpret the coefficient of interest as a causal effect. As a supplementary analysis, we perform a falsification exercise in the following manner: we set the rollout of the program (2007-2012) six years behind, during the pre-treatment years (2001-2006), and then we estimate the impact of SMSXXI on the subsample of pre-treatment years (2001-2006). As in the main results models, we cluster standard errors at the jurisdiction level.

Child Mortality

To calculate the mortality rate at the first week, month and year of life we employ the death certificates registered by INEGI, for years 2001 to 2014. These records include dates of birth at the day, month, year level, which allows us to precisely assign everyone a year-of-birth cohort. The records also include the cause of mortality, defined in terms of the CIE-10 codes at the 1 letter and 3 digits' level, and the place of residence, at the state and municipality level. Using this information, we construct mortality rates for the conditions considered in each

individual catalogue of SMSXXI, for each year-of-birth and each period of life. We construct our mortality outcome using the following definition:

$$y_{cjt}^A = \frac{\sum Mortality_{cjt}^A}{Living Births_{jt}} * 1000$$

In this outcome, c indexes catalogues, j indexes health jurisdictions (residence), and t indexes the year-of-birth cohort. The indicator A refers to the three periods of life we analyze (first week, month and year). The numerator is the number of mortalities due to conditions considered in catalogue c , in jurisdiction j for the year-of-birth cohort t . The denominator is as the previous ones, that is, the number of living births in health jurisdiction j in year t according to INEGI.

Now, we present descriptive statistics for the mortality rate due to conditions included in SMSXXI's coverage. Tables Y7 to Y9 report the mortality rate for all causes for each year-of-birth cohort, and then disaggregate the rate by the catalogues' conditions. The tables reveal that conditions covered by SMSXXI represent approximately a quarter of all mortalities during the first week and first month of life, even though the mortality rate for all conditions during the first month is more than double the rate during the first week (8 vs. 3 mortalities). For the first year of life, SMSXXI covers conditions responsible for 21-22% of all mortalities, with a global rate of approximately 13 death per every 1000 living births. In all, the tables indicate that between a fourth and a fifth of all mortalities correspond to conditions potentially covered by SMSXXI.

In Figures 8 to 10 we plot the trends for mortality rates per 1000 living births, for each catalogue group. The graphs are in deviations from the mean of each catalogue group. The vertical lines mark the year in which each catalogue group enters coverage (the color pairs each

catalogue with its first year in the program). For the first week and first month of life (figures 8 and 9), most of the change in the mortality rate is provoked by the first two catalogues (2007-2008 and 2009), and after entering coverage the variation is smaller. It is also noticeable that the series for the 2009 catalogue seems to revert to the mean after year 2011. For the first year of life (figure 10), the 2013 catalogue exhibits more variability, but it still shows a decrease when entering coverage. A final comment refers to the relatively small movement shown by the 2010-2011 and 2012 catalogues, but this is most likely due to their small size in terms of total conditions added to coverage.

Next, we present our empirical methodology and regression specifications for estimating the effect of SMSXXI on mortality rates. As in the case of hospital discharges, we use a triple difference strategy, exploiting variation in both the timing of catalogues and geographical areas for entering coverage. Our empirical specification is as follows:

$$y_{cjt}^A = \tau * (Active_{cjt}) + \phi_{cj} + \phi_{ct} + \phi_{jt} + \varepsilon_{cjt}$$

In Equation (1.11), c indexes catalogues, j indexes jurisdictions, and t indexes years of birth. y_{cjt}^A is the outcome of interest, which in this specification represents the mortality rate due to conditions covered by catalogue c in state e per 1000 newborns in year t , for life periods A (first week, first month and first year of life). $Active_{cjt}$ is a dummy variable which is the interaction of two indicator variables: (i) a dummy indicating whether jurisdiction j in year t has at least one hospital which has established a collaboration agreement with the CNPSS, and (ii) a dummy indicating if the conditions considered in catalogue c are already part of SMSXXI's coverage for

year t . The coefficient of interest is τ , which represents the average treatment effect of entering SMSXXI's coverage on the mortality rate for conditions in catalogue c in jurisdiction j . We also include fixed effects to control for time-invariant characteristics of each jurisdiction-catalogue group (ϕ_{cj}), changes over time in each jurisdiction (ϕ_{jt}) and nationwide changes over time in each catalogue group (ϕ_{ct}). Finally, the error term ε_{cjt} represents unobserved heterogeneity. We cluster standard errors at the jurisdiction level. For all models of this specification we apply weights at the catalogue-jurisdiction (cj) level. Our weights are defined as follows: for each cj combination, we interact (i) the total number of mortalities for conditions from catalogue c in each jurisdiction j during the pre-treatment years (2001-2006), with (ii) the total population of children under 5 years of age in jurisdiction j according to the 2010 Mexican Census.

As with discharges, we perform a supplementary analysis to test the parallel trends assumption on pre-treatment outcomes. For this falsification exercise, we set the start of the program for each jurisdiction j six years before the actual start of the program (that is, 2007 becomes 2001, and so on), and for catalogues c , we set their entrance to coverage six years before (2007 catalogue becomes 2001, and so on). Hence, we shift the entire distribution of treatment statuses for each jurisdiction-catalogue six years before. We estimate the triple diff model specified in equation (1.11) with our shifted treatment variable in the subsample of pre-treatment years (2001-2006). As in the main specification, we use the same set of catalogue-jurisdiction weights and cluster the standard errors at the jurisdiction level.

Long Run Child Health Outcomes

To estimate the impact of SMSXXI on long run health outcomes, we use indicators for height and weight coming from the “Registro Nacional de Talla y Peso” (RNPT), gathered by the “Hospital Nacional de Ciencias Médicas y Nutrición Salvador Zubirán”. This is a national registry for all children in primary school, designed to study the nutritional status Mexican children. The RNPT includes measurements for height and weight for children of aged six to 12 years. The RNPT was collected during 2015-2016, and by 2018, it already had information on over 12 million 700 thousand children, which represents 89.36% of the preplanned goal¹³, according to the hospital.

For our analysis of height, we use the reference groups provided by the Multicentre Growth Reference Study performed by the WHO (2006). Using the median values provided in that study, we calculate z-scores for height for each age and sex of children. Our outcome variable for height takes the form:

$$y_{siea} = \frac{t_{siea} - \bar{t}_{sa}}{\sigma_{sa}}$$

In this outcome, s indexes sex (male or female), i indexes a child, e indexes the child’s state of residence and a indexes the age in months. Hence, outcome y_{siea} represents the z-score of height, that is, the difference between the height of child i of age a and sex s and the median of her age group and sex according to the WHO Reference Study, divided by the standard deviation of his/her age group and sex. The state index e is included for the purposes of estimating the treatment effect using the variation in program take-up at the state level, but it does not interact with the outcome measure.

¹³ This can be checked in the following link: <http://rnpt.sivne.org.mx/micrositio/indextestoldver.php>

Additionally, we analyze the impact on the children's body mass index (BMI). We define this outcome as:

$$y_{sie} = \frac{mass_{sie}}{height_{sie}^2}$$

Here, s indexes sex (male or female), i indexes a child, and e indexes the child's state of residence. The BMI represents a simple numeric measure of weight, accounting for differences in size for children i . As in the previous case, the state index e is included for the purposes of estimating the treatment effect using the variation in program take-up at the state level, but it does not interact with the outcome measure.

Hereon, we provide a descriptive analysis for the height outcome. Tables 10 and 11 report the average height, the 5th and 95th percentile and the number of observations for each group of ages between 6 and 12 years, for boys and girls respectively. Comparing both tables, we can appreciate that the average height remains relatively close, consistent with the fact that these children have yet to reach puberty. Each table also shows that the largest amount of observations for our sample is concentrated between ages 7 to 11.

Figures 11 and 12 plot the average height for each month-year cohort, comparing our sample (RNPT) with the reference groups from the WHO growth study, for boys and girls respectively. The graphs group children according to their age in months, ranging from 72 to 120 months (6 to 10 years old). These graphs show that, for both sexes, the Mexican average is approximately two centimeters lower than the median height reported by the WHO reference groups, suggesting that there is still space for improvement in long run health outcomes in Mexico.

In the following section, we present our empirical methodology and regression specifications for the effect of SMSXXI on height. We estimate a difference-in-difference model, for the effect of exposition to the insurance program during the first year of life on children who are between the ages of 6 and 12 in 2015. We exploit information on dates of birth at the month level and state of residency to assign different levels of exposure to the program. Our specification is as follows:

$$Y_{ice} = \alpha + \delta Afi_{ce} + \sum_{j=1}^J Age_{mi} \times Sex_i + \phi_e + \phi_c + \varepsilon_{ice}$$

In Equation (1.12), Y_{ice} is a long run health indicator such as weight, height or BMI, for student i born in the month-year cohort of birth c living in state e . Afi_{ce} corresponds to the percentage of population under 5 years of age living in jurisdictions with at least one treated hospital, for each state e for cohort of birth c . $\sum_{j=1}^J Age_{mi} \times Sex_i$ is the fully saturated interaction of an indicator for sex of student i and binary variables for each cohort of birth c . This way, we estimate impacts using both variation by cohort of birth within a state and variation for the same cohort between states. ϕ_e and ϕ_c are fixed effects for each state and cohort of birth, and ε_{ice} is the error term representing unobserved heterogeneity. Coefficient of interest is δ , which captures the effect of living in a state with varying percentages of population with access to the program during the first year of life on health outcomes. In particular, δ can be read as the effect of going from 0 to 100% of population covered. Since few states did full take-up of the program, we interpret δ on the average of state coverage during the first year of life of students considered in the RNPT. For statistical inference, we cluster standard errors at the school level.

Appendix C: Descriptive Figures and Tables

Figure C1: Affiliation to Seguro Popular by date-of-birth eligibility

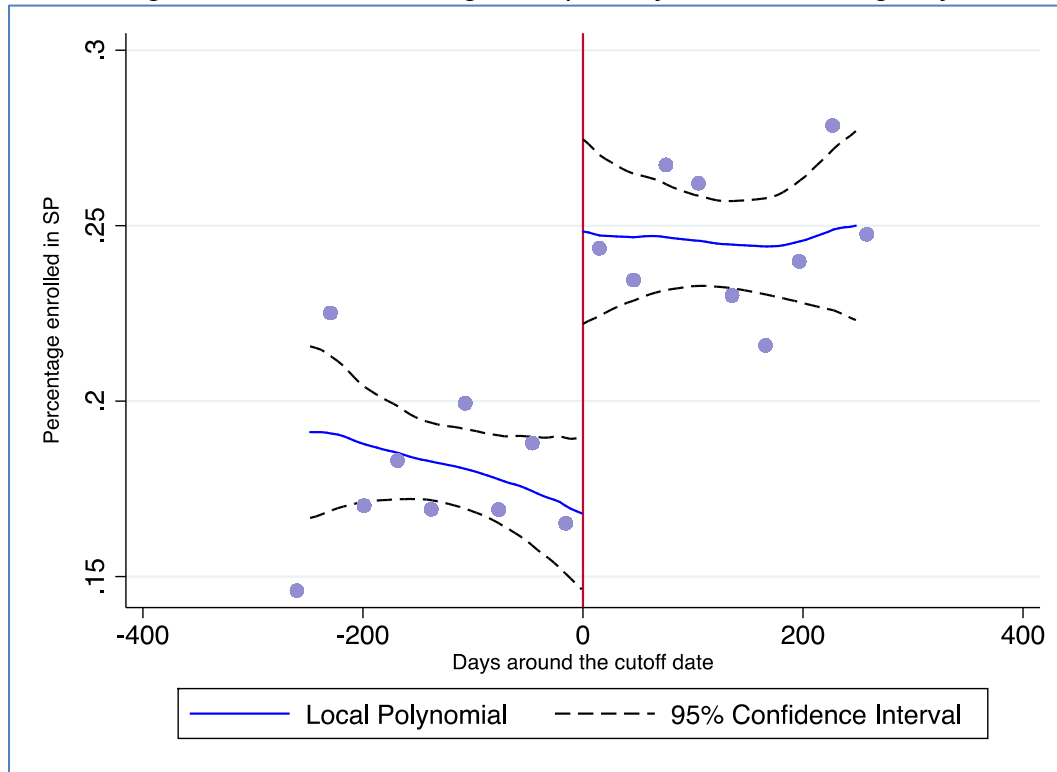


Figure 1 shows the affiliation status of heads of household and their spouses with respect to Seguro Popular, according to their children's date of birth. The vertical axis shows the average percentage of affiliation for heads of household and their spouses, and the horizontal axis shows the date of birth of their children, relative to the cut-off date of December 1st, 2006. Eligible households are those with children born on or after the cut-off date, that is, those located on or right of the vertical line. We estimate a first-degree local polynomial on each side of the cut-off. Dashed lines show a 95% confidence interval for the local polynomial. Data points show the average affiliation according to the children's month of birth, that is, grouping observations every 30 days.

Figure C2: Population under 5 years of age in geographical areas with access to SMSXII

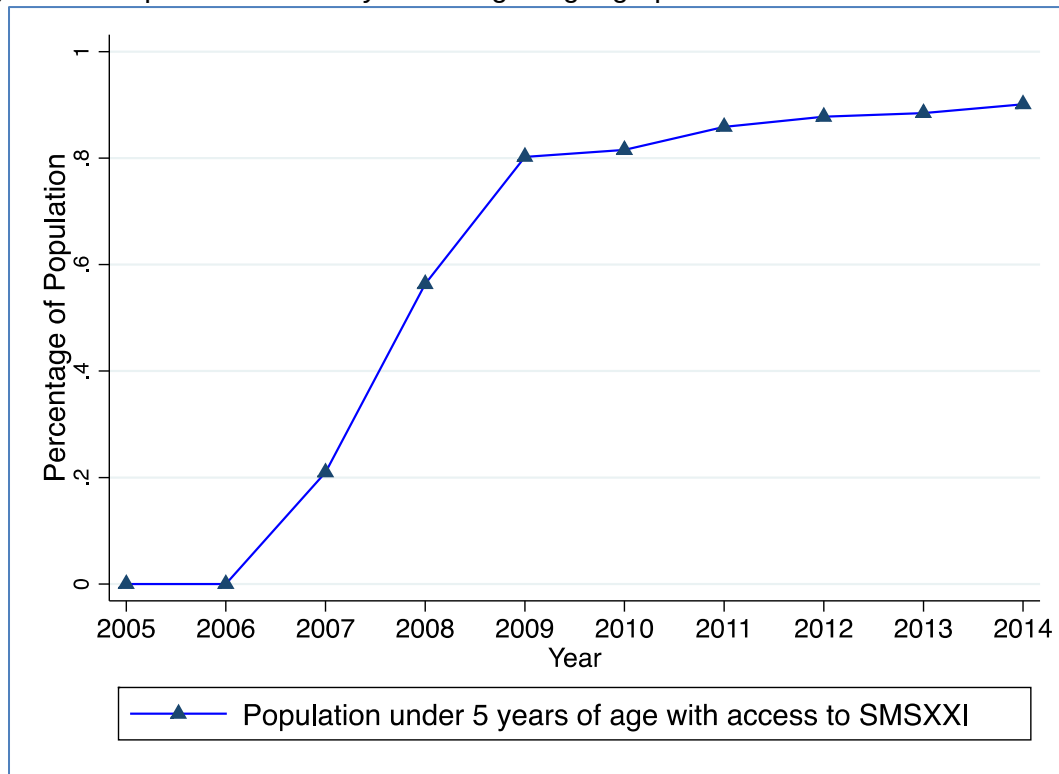


Figure 2 shows SMSXII's coverage for children under 5 years of in Mexico. The y axis is the percentage of population covered and the x axis is the year of operation. We consider the population treated if they live in a municipality located in a health jurisdiction with at least one hospital who has already signed a collaboration agreement with the program. For population, we use the 2010 Mexican Census, and for treatment status, we use the financial registers provided by the CNPSS.

Figure C3: Probability of catastrophic expenditures in health

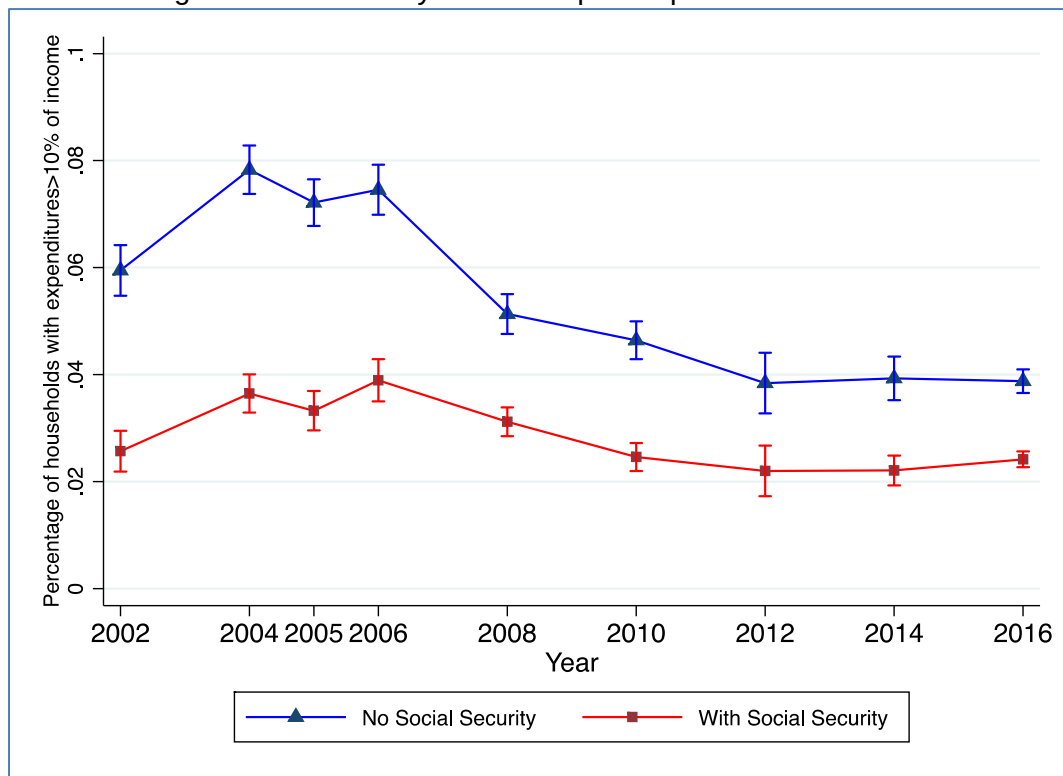


Figure 3 shows the likelihood of spending more 10% of the household's income in health expenditures. Each observation is the average for each year and social security status, using the survey weights provided by the ENIGH. Intervals represent the 95% confidence interval.

Figure C4: Probability of catastrophic expenditures in health, conditional on positive expenditures

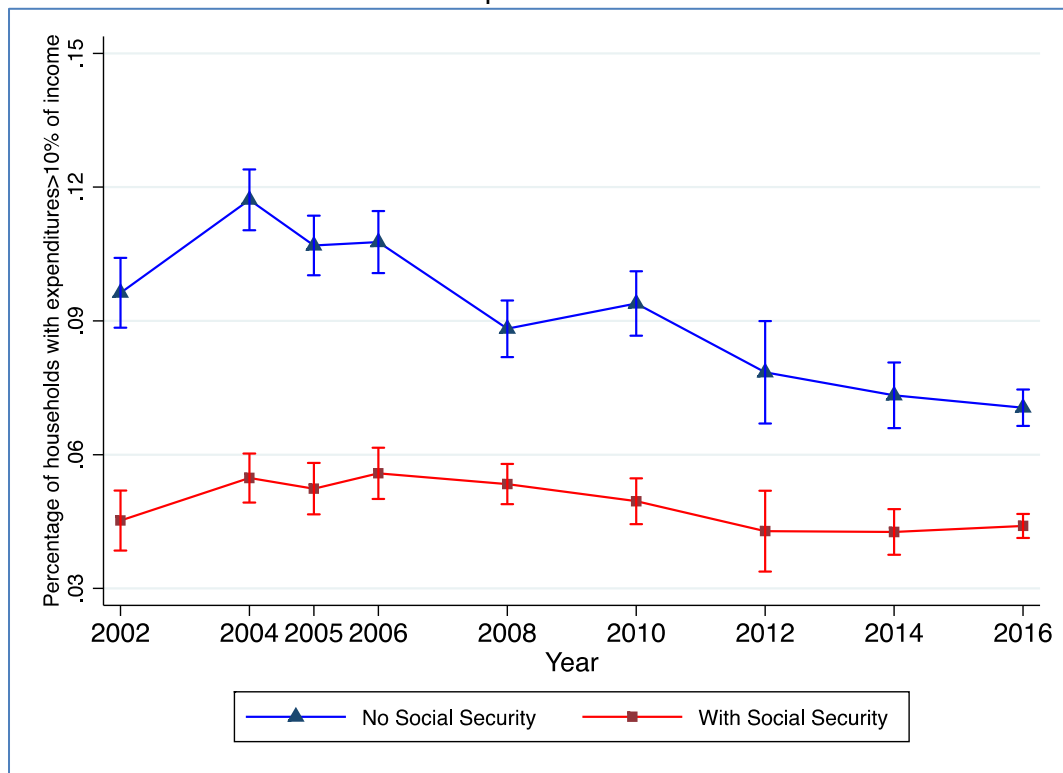


Figure 4 shows the likelihood of spending more 10% of the household's income in health expenditures, conditional on expenditures being larger than zero. Each observation is the average for each year and social security status, using the survey weights provided by the ENIGH. Intervals represent the 95% confidence interval.

Figure C5: Trends in the hospital discharge rate, first week of life.

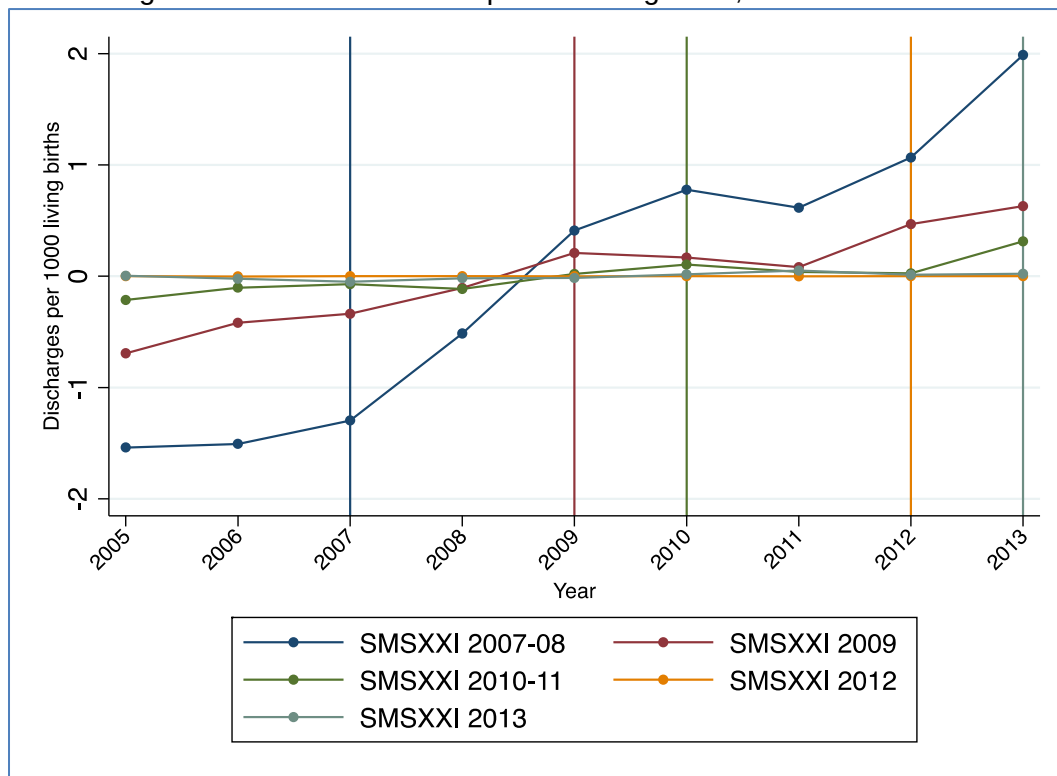


Figure 5 shows the discharge rate per 1000 living births during the first week of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C6: Trends in the hospital discharge rate, first month of life.

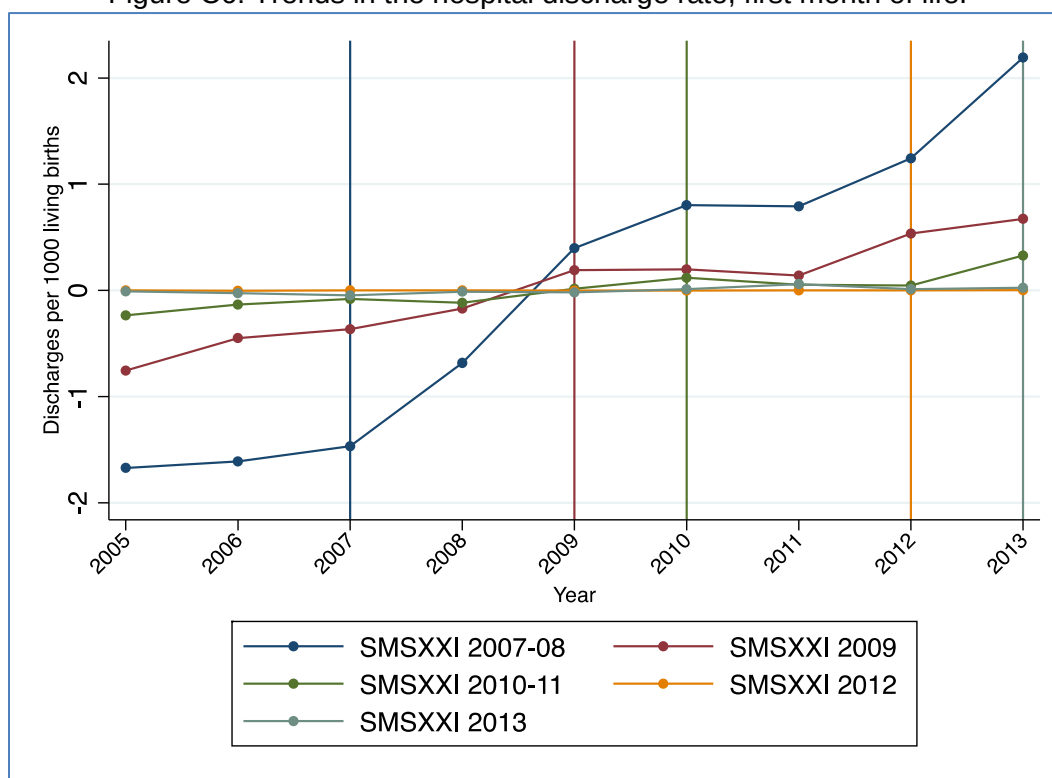


Figure 6 shows the discharge rate per 1000 living births during the first month of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C7: Trends in the hospital discharge rate, first year of life.

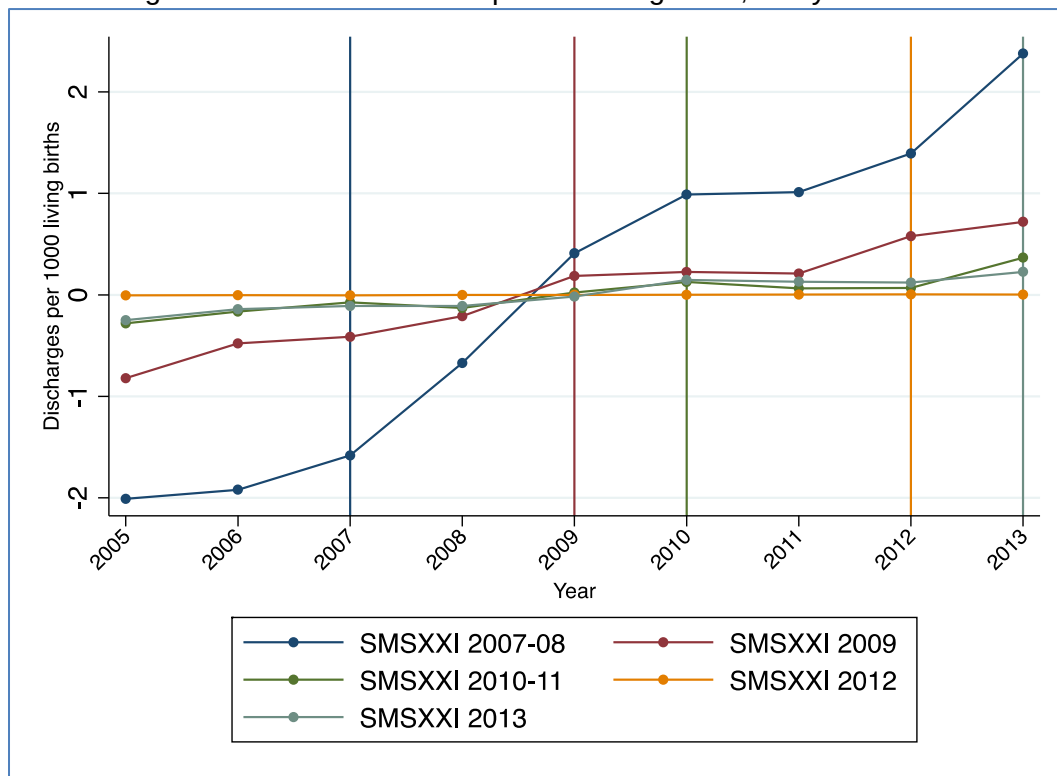


Figure 7 shows the discharge rate per 1000 living births during the first year of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C8: Trends in the mortality rate, first week of life.

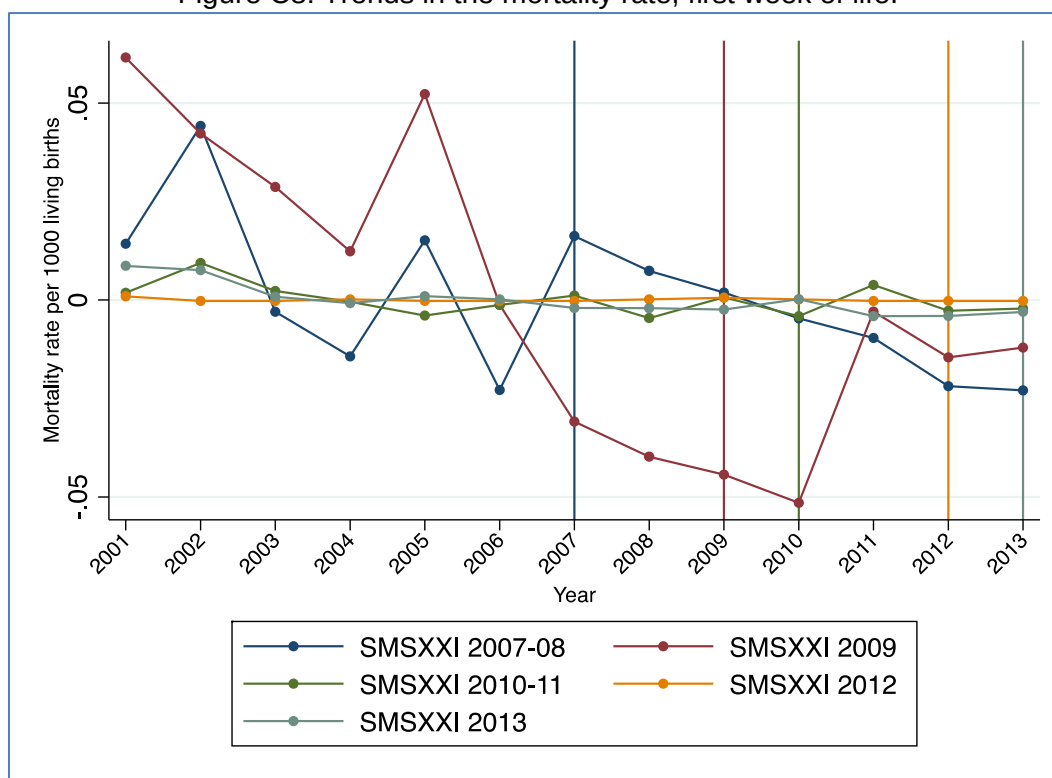


Figure 8 shows the mortality rate per 1000 living births during the first week of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C9: Trends in the mortality rate, first month of life.

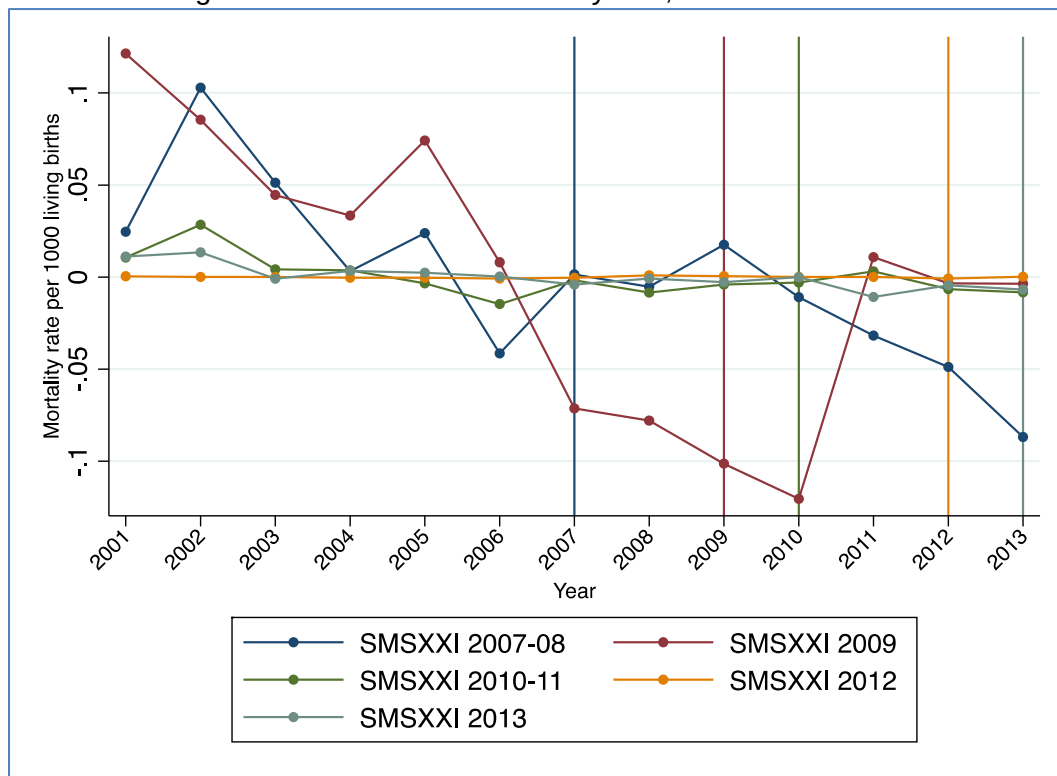


Figure 9 shows the mortality rate per 1000 living births during the first month of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C10: Trends in the mortality rate, first year of life.

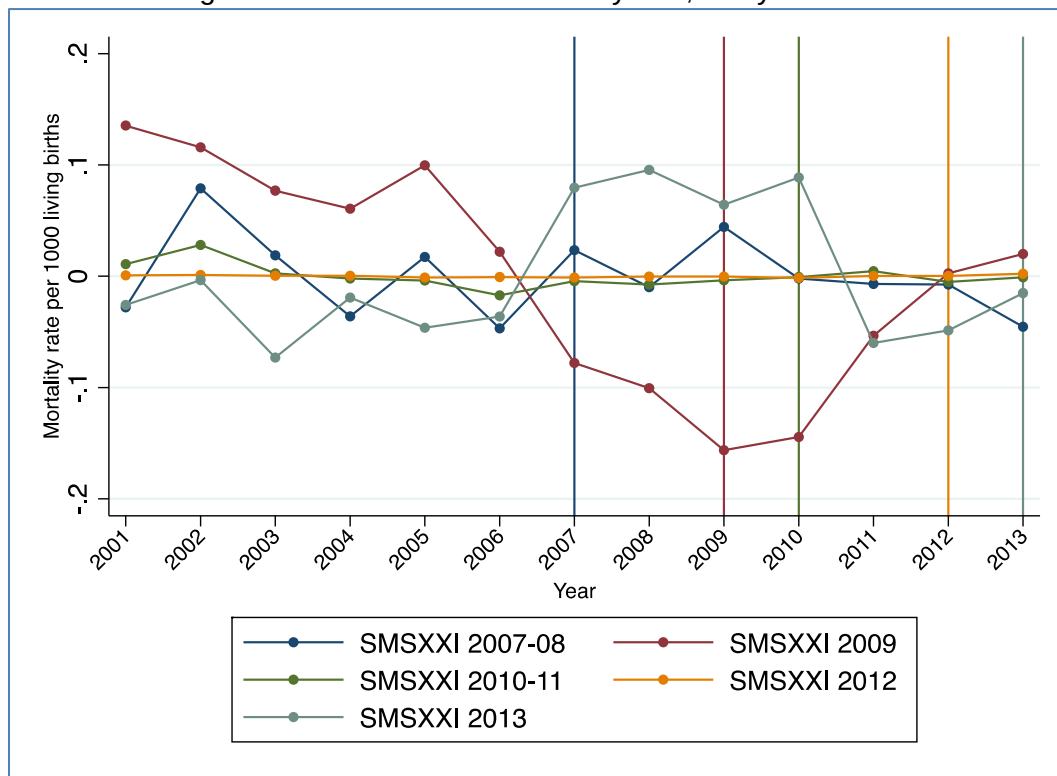


Figure 10 shows the mortality rate per 1000 living births during the first year of life, for each year and catalogue group. Rates are displayed in deviations from the mean for each catalogue group. Vertical lines in colors indicate the year in which each catalogue enters SMSXXI coverage.

Figure C11: Height for age in boys, RNPT and WHO study.

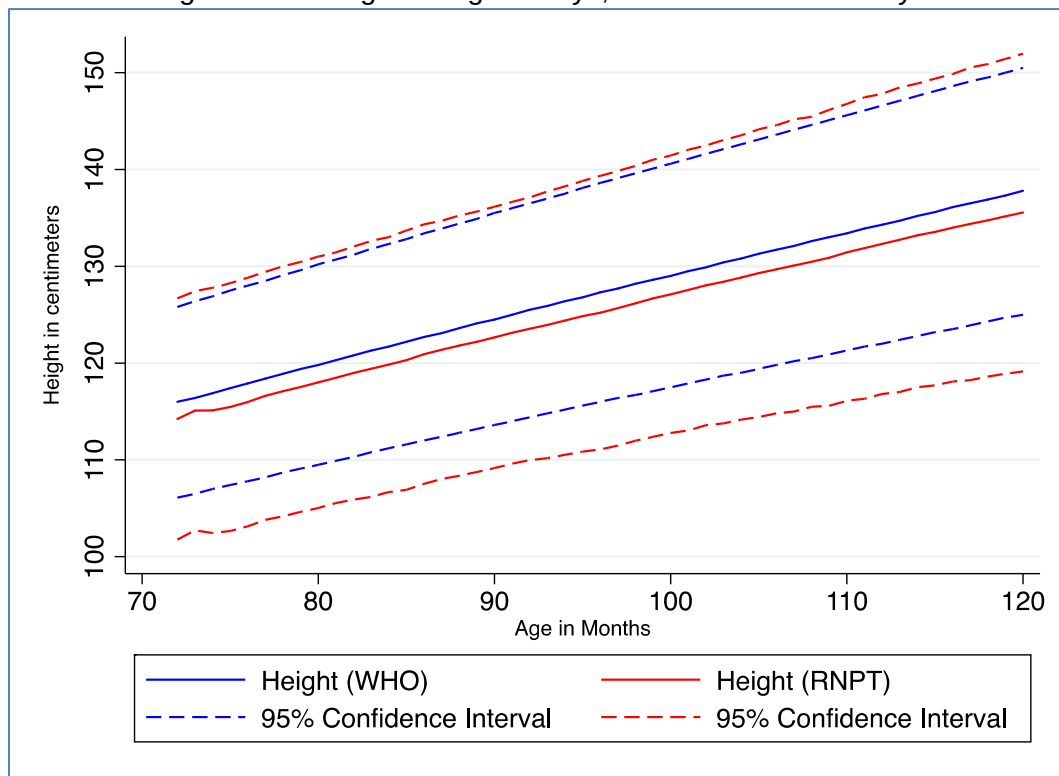


Figure 11 shows the height for boys ages 72 to 120 months (6 to 10 years old). The blue line shows the median for a given age for the respective reference group, provided by the WHO growth reference study. Blue dashed lines report the confidence interval of -2 and +2 S.D. The red line shows the average height for boys considered in the RNPT, and the red dashed lines displaying the confidence interval of -2 and +2 S.D.

Figure C12: Height for age in girls, RNPT and WHO study.

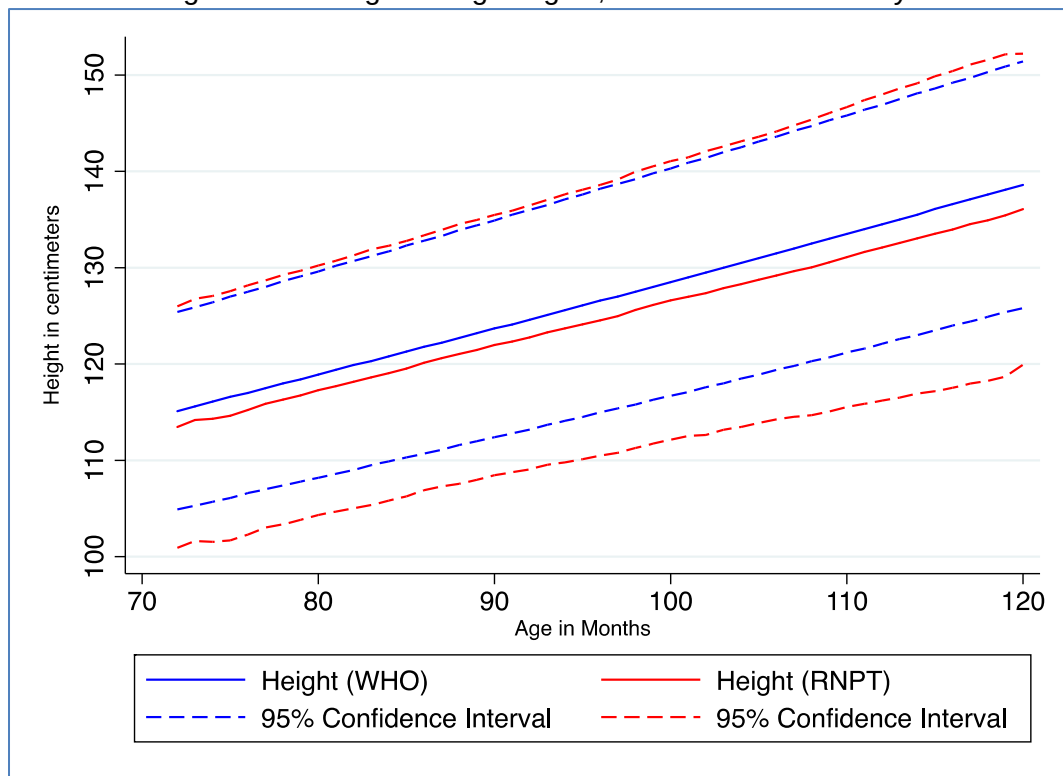


Figure 12 shows the height for girls ages 72 to 120 months (6 to 10 years old). The blue line shows the median for a given age for the respective reference group, provided by the WHO growth reference study. Blue dashed lines report the confidence interval of -2 and +2 S.D. The red line shows the average height for boys considered in the RNPT, and the red dashed lines displaying the confidence interval of -2 and +2 S.D.

Table C1: Conditions covered by SMSXXI

Conditions Catalogue	Year of operation	Publishing date	Total number of covered conditions	Number of newly-included conditions	Catalogue group n°
(1)	(2)	(3)	(4)	(5)	(6)
1	2007	21/2/07	108	108	--
2	2008	31/3/08	108	0	1
3	2009	30/2/08	116	8	2
4	2010	29/12/09	128	12	3
5	2011	29/12/10	128	0	--
6	2012	27/12/11	131	3	4
7	2013	28/2/13	140	9	5

Notes: This table describes the entry of conditions into SMSXXI's coverage list, according to the program's operational rules (ROP) and its respective legal creation agreement. For years 2008 and onwards, the ROP are published on a yearly basis. Exceptionally, for 2007, the legal creation agreement was published without providing a detailed list of conditions covered. We proxy those conditions with the 2008 catalogue, following the recommendation made by authorities from the Liaison Direction of SMSXXI.

Table C2: SMSXXI coverage by municipalities

Start year	Newly-included municipalities	Total municipalities covered	Coverage as a percentage of total
2007	324	324	13.15%
2008	923	1247	50.63%
2009	642	1889	76.70%
2010	70	1959	79.54%
2011	101	2060	83.64%
2012	43	2103	85.38%
2013	10	2113	85.79%
2014	53	2166	87.94%
No coverage	297	297	12.06%
Total	2463	2463	100%

Table C3: Sociodemographic characteristics - ENIGH Households Panel 2002-2016

Variables	2002	2004	2005	2006	2008	2010	2012	2014	2016
Prim. Schooling (=1)	0.8082 (0.0041)	0.8369 (0.0032)	0.8500 (0.0031)	0.8543 (0.0033)	0.8573 (0.0031)	0.8570 (0.0031)	0.8637 (0.0053)	0.8732 (0.0035)	0.8815 (0.0019)
Sec. Schooling (=1)	0.3273 (0.0045)	0.3378 (0.0043)	0.3687 (0.0040)	0.3758 (0.0043)	0.3734 (0.0042)	0.3981 (0.0043)	0.4317 (0.0071)	0.4325 (0.0053)	0.4607 (0.0029)
Higher Ed. (=1)	0.0852 (0.0024)	0.0791 (0.0026)	0.0910 (0.0024)	0.0851 (0.0025)	0.0688 (0.0021)	0.0709 (0.0022)	0.0781 (0.0034)	0.0706 (0.0026)	0.0717 (0.0013)
Age	47.6593 (0.1815)	48.8042 (0.1474)	48.9894 (0.1405)	48.8333 (0.1521)	46.7480 (0.1377)	46.7488 (0.1396)	47.0916 (0.2410)	47.6631 (0.1718)	47.6563 (0.0954)
Size of household	3.9625 (0.0215)	3.8352 (0.0186)	3.8812 (0.0183)	3.7528 (0.0190)	4.0420 (0.0183)	3.8513 (0.0184)	3.7308 (0.0295)	3.7929 (0.0207)	3.5836 (0.0109)
Nº of Women	2.0455 (0.0135)	2.0177 (0.0118)	2.0022 (0.0114)	1.9501 (0.0120)	2.0741 (0.0116)	1.9591 (0.0116)	1.9007 (0.0187)	1.9347 (0.0132)	1.8376 (0.0070)
Nº of minors	1.0423 (0.0134)	1.0024 (0.0112)	0.9769 (0.0108)	0.9512 (0.0114)	1.1119 (0.0111)	1.0433 (0.0109)	0.9737 (0.0175)	0.9703 (0.0123)	0.9146 (0.0065)
N	10250	12787	13859	12428	13117	13055	4658	8764	29610

Notes: This table presents the average and standard error for the main sociodemographic characteristics of households without Access to social security included in the "Encuesta Nacional de Gastos e Ingresos" (ENIGH), for each year of the survey. Averages are calculated using the sampling weights provided by the ENIGH, and they are reported in the first row for each variable. Standard error of the mean is reported below the mean, in parentheses.

Table C4: Hospital Discharge rate per 1000 living births, first week of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
All discharges	37.61	38.73	41.31	43.76	45.90	46.93	47.81	50.12	53.19	69.50
108 new (2008)	10.89	10.92	11.13	11.91	12.84	13.20	13.04	13.49	14.42	18.92
8 new (2009)	4.76	5.04	5.12	5.35	5.66	5.62	5.54	5.92	6.08	7.89
12 new (2010)	0.92	1.03	1.07	1.02	1.16	1.24	1.18	1.16	1.45	1.85
3 new (2012)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
9 new (2013)	0.25	0.23	0.20	0.23	0.23	0.27	0.30	0.26	0.27	0.30
SMSXXI's percentage of total	44.76%	44.46%	42.41%	42.33%	43.34%	43.33%	41.95%	41.59%	41.78%	41.68%

Notes: This table presents the hospital discharge rate per 1000 living births for the first week of life. Row 1 presents the discharge rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total conditions covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C5: Hospital Discharge rate per 1000 living births, first month of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
All discharges	42.55	43.78	46.50	48.89	51.47	52.69	54.38	56.73	60.16	77.67
108 new (2008)	12.05	12.11	12.25	13.04	14.12	14.52	14.51	14.96	15.91	20.79
8 new (2009)	5.09	5.40	5.48	5.67	6.04	6.04	5.99	6.38	6.52	8.43
12 new (2010)	0.99	1.09	1.14	1.11	1.24	1.34	1.28	1.27	1.55	1.97
3 new (2012)	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.01	0.01
9 new (2013)	0.28	0.27	0.25	0.28	0.27	0.31	0.35	0.31	0.32	0.34
SMSXXI's percentage of total	43.28%	43.09%	41.14%	41.12%	42.10%	42.17%	40.70%	40.41%	40.40%	40.61%

Notes: This table presents the hospital discharge rate per 1000 living births for the first month of life. Row 1 presents the discharge rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total conditions covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C6: Hospital Discharge rate per 1000 living births, first year of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
All discharges	63.63	65.84	70.31	71.86	74.10	77.89	78.81	81.85	85.39	93.79
108 new (2008)	12.76	12.85	13.18	14.10	15.18	15.76	15.78	16.16	17.14	21.76
8 new (2009)	5.37	5.72	5.78	5.99	6.38	6.42	6.41	6.78	6.92	8.75
12 new (2010)	1.06	1.18	1.27	1.21	1.36	1.47	1.41	1.41	1.71	2.09
3 new (2012)	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02
9 new (2013)	1.20	1.31	1.34	1.34	1.43	1.59	1.58	1.57	1.67	1.20
SMSXXI's percentage of total	32.06%	31.99%	30.70%	31.52%	32.88%	32.42%	31.96%	31.68%	32.16%	36.05%

Notes: This table presents the hospital discharge rate per 1000 living births for the first year of life. Row 1 presents the discharge rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total conditions covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C7: Mortality rate per 1000 living births, first week of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013
All mortalities	3.625	3.392	3.376	3.224	3.251	3.211	3.242	3.338	3.180
108 new (2008)	0.566	0.528	0.567	0.558	0.553	0.546	0.541	0.529	0.528
8 new (2009)	0.327	0.273	0.244	0.235	0.230	0.223	0.272	0.260	0.262
12 new (2010)	0.021	0.024	0.027	0.021	0.026	0.022	0.029	0.022	0.023
3 new (2012)	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000
9 new (2013)	0.007	0.007	0.001	0.000	0.000	0.004	0.002	0.000	0.001
SMSXXI's percentage of total	25.420%	24.549%	24.852%	25.258%	24.925%	24.755%	26.039%	24.313%	25.601%

Notes: This table presents the mortality rate per 1000 living births for the first week of life. Row 1 presents the mortality rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total mortalities covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C8: Mortality rate per 1000 living births, first month of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013
All mortalities	8.599	8.189	8.006	7.874	7.904	7.852	7.974	8.022	7.758
108 new (2008)	1.338	1.273	1.318	1.311	1.334	1.305	1.283	1.266	1.228
8 new (2009)	0.695	0.629	0.551	0.544	0.519	0.499	0.631	0.618	0.617
12 new (2010)	0.072	0.062	0.076	0.068	0.073	0.075	0.079	0.068	0.068
3 new (2012)	0.000	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001
9 new (2013)	0.018	0.016	0.005	0.006	0.003	0.009	0.004	0.003	0.001
SMSXXI's percentage of total	24.690%	24.182%	24.36%	24.51%	24.42%	24.05%	25.06%	24.36%	24.69%

Notes: This table presents the mortality rate per 1000 living births for the first month of life. Row 1 presents the mortality rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total mortalities covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C9: Mortality rate per 1000 living births, first year of life

	2005	2006	2007	2008	2009	2010	2011	2012	2013
All mortalities	13.690	12.956	12.799	12.286	12.205	12.333	12.529	12.573	12.707
108 new (2008)	1.601	1.536	1.610	1.576	1.630	1.583	1.577	1.577	1.538
8 new (2009)	1.026	0.948	0.849	0.827	0.768	0.778	0.869	0.928	0.946
12 new (2010)	0.088	0.077	0.090	0.085	0.090	0.094	0.098	0.086	0.093
3 new (2012)	0.002	0.003	0.002	0.003	0.003	0.002	0.003	0.004	0.006
9 new (2013)	0.162	0.169	0.277	0.290	0.259	0.287	0.146	0.147	0.182
SMSXXI's percentage of total	21.03%	21.09%	22.10%	22.64%	22.53%	22.25%	21.50%	21.81%	21.74%

Notes: This table presents the mortality rate per 1000 living births for the first year of life. Row 1 presents the mortality rate for all conditions, and the following rows report the rate according to the SMSXXI's catalogue groups. The bottom row reports the percentage of total mortalities covered by the SMSXXI's catalogues, considering all conditions covered in the ROP from 2007 to 2013.

Table C10: Descriptive statistics for height - Boys

Age	5 th percentile	Mean	95 th percentile	N
6y	106	117.011	128	550,958
7y	111	122.396	134	858,829
8y	116	127.726	140	878,031
9y	120	132.890	145	867,471
10y	125	138.177	151	860,418
11y	130	143.568	158	810,316
12y	132	147.910	163	181,834

Notes: This table describes the height (in centimeters) for all boys ages 6 to 12, based on the RNPT dataset. For every age, we report the 5th and 95th percentile, the mean and the number of observations.

Table C11: Descriptive Statistics for height – Girls

Age	5 th percentile	Mean	95 th percentile	N
6 años	105	116.252	127	534,843
7 años	110	121.663	133	828,533
8 años	116	127.162	139	847,718
9 años	120	132.776	146	839,665
10 años	125	139.023	153	829,439
11 años	130	145.024	159	783,382
12 años	134	148.902	162	169,137

Notes: This table describes the height (in centimeters) for all girls ages 6 to 12, based on the RNPT dataset. For every age, we report the 5th and 95th percentile, the mean and the number of observations.

Table C12: State level start years
for SMSXXI

State	First Year
Aguascalientes	2008
Baja California	2008
Baja California Sur	2009
Campeche	2008
Coahuila	2008
Colima	2008
Chiapas	2007
Chihuahua	2007
Distrito Federal	2007
Durango	2008
Guanajuato	2007
Guerrero	2008
Hidalgo	2007
Jalisco	2008
México	2008
Michoacán	2007
Morelos	2007
Nayarit	2008
Nuevo León	2007
Oaxaca	2008
Puebla	2007
Querétaro	2008
Quintana Roo	2008
San Luis Potosí	2007
Sinaloa	2007
Sonora	2007
Tabasco	2007
Tamaulipas	2008
Tlaxcala	2008
Veracruz	2008
Yucatán	2008
Zacatecas	2008

Appendix D: Full Specification Tables for Robustness Checks

Table D1: Effect of SMSXXI on probability of health expenditures over 10% of income

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.006 (0.007)	-0.006 (0.007)	0.002 (0.007)	-0.000 (0.007)	0.013 (0.010)
SMSXXI * No Soc. Security			-0.018*** (0.003)	-0.013*** (0.003)	
	239726	239726	239726	239726	83811
Panel 2: Municipality level Treatment					
SMSXXI	-0.004 (0.004)	-0.004 (0.004)	0.002 (0.004)	0.000 (0.004)	0.009 (0.006)
SMSXXI * No Soc. Security			-0.015*** (0.003)	-0.011*** (0.003)	
	N 239721	239721	239721	239721	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures exceeding 10% of total income. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is a dummy indicator which takes the value 1 when the household spends more than 10% of its total income on health expenditures, 0 if less than 10%. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D2: Effect of SMSXXI on health expenditures as a percentage of income

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.004 (0.002)	-0.004 (0.002)	-0.001 (0.002)	-0.002 (0.002)	0.003 (0.003)
SMSXXI * No Soc. Security			-0.005*** (0.001)	-0.004*** (0.001)	
	239723	239723	239723	239723	83811
Panel 2: Municipality level Treatment					
SMSXXI	-0.003** (0.001)	-0.003** (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.002 (0.002)
SMSXXI * No Soc. Security			-0.005*** (0.001)	-0.003*** (0.001)	
N	239718	239718	239718	239718	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures as a percentage of income. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is the ratio between household's health expenditures and its total income. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D3: Effect of SMSXXI on probability of health expenditures over 10% of income due to services not related to pregnancy and childbirth

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.006 (0.006)	-0.007 (0.006)	-0.000 (0.006)	-0.003 (0.006)	0.007 (0.008)
SMSXXI * No Soc. Security			-0.014*** (0.003)	-0.009*** (0.003)	
	239726	239726	239726	239726	83811
Panel 2: Municipality level Treatment					
SMSXXI	0.001 (0.003)	0.000 (0.003)	0.005* (0.003)	0.003 (0.003)	0.003 (0.004)
SMSXXI * No Soc. Security			-0.011*** (0.002)	-0.007*** (0.002)	
N	239721	239721	239721	239721	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures exceeding 10% of total income due to services no related to pregnancy and childbirth. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is a dummy indicator which takes the value 1 when the household spends more tan 10% of its total income on health expenditures, 0 if less than 10%. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D4: Effect of SMSXXI on health expenditures as a percentage of income due to services not related to pregnancy and childbirth

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.003 (0.002)	-0.003 (0.002)	-0.001 (0.002)	-0.002 (0.002)	-0.000 (0.002)
SMSXXI * No Soc. Security			-0.004*** (0.001)	-0.002*** (0.001)	
	239723	239723	239723	239723	83811
Panel 2: Municipality level Treatment					
SMSXXI	-0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)	-0.001 (0.001)	0.001 (0.001)
SMSXXI * No Soc. Security			-0.003*** (0.001)	-0.002** (0.001)	
	N 239718	239718	239718	239718	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures as a percentage of income due to services not related to pregnancy and childbirth. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is the ratio between household's health expenditures and its total income. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D5: Effect of SMSXXI on probability of health expenditures over 10% of income due to services related to pregnancy and childbirth

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.002 (0.002)	-0.002 (0.002)	-0.001 (0.002)	0.000 (0.002)	0.009* (0.004)
SMSXXI * No Soc. Security			-0.002 (0.001)	-0.004*** (0.001)	
	239726	239726	239726	239726	83811
Panel 2: Municipality level Treatment					
SMSXXI	-0.004** (0.002)	-0.004** (0.002)	-0.004* (0.002)	-0.003 (0.002)	0.006 (0.004)
SMSXXI * No Soc. Security			-0.002 (0.001)	-0.003** (0.001)	
N	239721	239721	239721	239721	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures exceeding 10% of total income due to services related to pregnancy and childbirth. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is a dummy indicator which takes the value 1 when the household spends more than 10% of its total income on health expenditures, 0 if less than 10%. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D6: Effect of SMSXXI on health expenditures as a percentage of income due to services related to pregnancy and childbirth

Specification	DID (1)	DID (2)	Interaction (3)	Interaction (4)	Falsification (5)
Panel 1: State level Treatment					
SMSXXI	-0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.004** (0.002)
SMSXXI * No Soc. Security			-0.001* (0.000)	-0.001*** (0.000)	
	239723	239723	239723	239723	83811
Panel 2: Municipality level Treatment					
SMSXXI	-0.001*** (0.001)	-0.001** (0.001)	-0.001* (0.001)	-0.001 (0.001)	0.002 (0.001)
SMSXXI * No Soc. Security			-0.001** (0.000)	-0.002*** (0.000)	
N	239718	239718	239718	239718	83804
Controls	NO	YES	NO	YES	NO

Notes: This table reports results for the effect of SMSXXI on the probability of household's health expenditures as a percentage of income due to services related to pregnancy and childbirth. Variable SMSXXI is a dummy indicator equal to 1 when the household's respective jurisdiction has access to SMSXXI. Second variable reports an interaction between program take-up and having no access to social security. We also report the average of the outcome variable for households with no access to social security during the pre-treatment years. Outcome variable is the ratio between household's health expenditures and its total income. All estimates use the sampling weights provided by the ENIGH. All estimates use fixed effects at the state and year level (panel 1) or municipality and year level (panel 2). Standard errors are clustered at the municipality level. * p<0.1, ** p<0.05, *** p<0.01

Table D7: Impact of SMSXXI on permanent hospital beds per 1000 living births

	Main (1)	TC 99% (2)	2001-2006 (3)
SM SXXI	1.262** (0.546)	1.724** (0.712)	
Falsification			-0.011 (0.150)
N	3388	3388	1452

Notes: This table presents the impact of SMSXXI on the availability of permanent hospital beds per 1000 living births. Column 1 presents main results, Column 2 reports results with top-coding on the outcome variable, and Column 3 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the jurisdiction and year level. Standard errors are clustered at the jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D8: Impact of SMSXXI on temporary hospital beds per 1000 living births

	Main (1)	TC 99% (2)	2001-2006 (3)
SM SXXI	2.470*** (0.487)	2.538*** (0.500)	
Falsification			0.158 (0.362)
N	3388	3388	1452

Notes: This table presents the impact of SMSXXI on the availability of temporary hospital beds per 1000 living births. Column 1 presents main results, Column 2 reports results with top-coding on the outcome variable, and Column 3 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the jurisdiction and year level. Standard errors are clustered at the jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D9: Impact of SMSXXI on incubators and cribs per 1000 living births

	Main (1)	TC 99% (2)	2001-2006 (3)
SM SXXI	0.743*** (0.162)	0.733*** (0.163)	
Falsification			0.022 (0.173)
N	3388	3388	1452

Notes: This table presents the impact of SMSXXI on incubators and cribs per 1000 living births. Column 1 presents main results, Column 2 reports results with top-coding on the outcome variable, and Column 3 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the jurisdiction and year level. Standard errors are clustered at the jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D10: Impact of SMSXXI on general physicians in contact with patients per 1000 living births

	Main (1)	TC 99% (2)	2001-2006 (3)
SM SXXI	-0.130 (0.468)	-0.195 (0.477)	
Falsification			-0.254* (0.137)
N	3388	3388	1452

Notes: This table presents the impact of SMSXXI on the number of general physicians in contact with patients per 1000 living births. Column 1 presents main results, Column 2 reports results with top-coding on the outcome variable, and Column 3 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the jurisdiction and year level. Standard errors are clustered at the jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D11: Impact of SMSXXI on specialist in contact with patients per 1000 living births

	Main (1)	TC 99% (2)	2001-2006 (3)
SM SXXI	1.893*** (0.665)	1.948*** (0.717)	
Falsification			0.006 (0.397)
N	3388	3388	1452

Notes: This table presents the impact of SMSXXI on the number of specialists in contact with patients per 1000 living births. Column 1 presents main results, Column 2 reports results with top-coding on the outcome variable, and Column 3 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the jurisdiction and year level. Standard errors are clustered at the jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D12: Impact of SMSXXI on hospital discharges per 1000 living births

Period of life	First week	First month	First year
	(1)	(2)	(3)
Panel 1: Main Results			
SMSXXI	0.179 (0.970)	0.310 (1.075)	0.366 (1.038)
N	1600	1600	1600
Panel 2: Top coding 99%			
SMSXXI	0.179 (0.970)	0.310 (1.075)	0.366 (1.038)
N	1600	1600	1600
Panel 3: Sub-sample 2005-2013			
SMSXXI	-0.165 (0.804)	-0.030 (0.895)	0.016 (0.857)
N	1440	1440	1440
Panel 4: Falsification			
SMSXXI	0.483 (0.683)	0.379 (0.718)	0.512 (0.758)
N	320	320	320

Notes: This table reports main results, robustness checks and falsification exercises for the impact of SMSXXI on the discharge rate per 1000 living births. Columns report results for the first week, first month and first year of life. In all models, we use weights at the catalogue-state level, where the weight is equal to the population under 5 years of age in each state interacted with the number of discharges during the first year of life in each state and for each catalogue for pre-treatment years. First panel shows main results; the second one top-codes values over the 99th percentile; third disregards the last year of data (2014) and the fourth panel shows a falsification exercise where we set the start of the program to 2005 for states that started on 2007, and 2006 for states that started on 2008-2009. For catalogues, our falsification exercises activates the first two catalogues on 2005 and the following three on 2006. Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D13: Impact of SMSXXI on probability of infection during hospital stay

	First week (1)	First month (2)	First year (3)
Panel 1: Principal			
SM SXXI	0.002 (0.004)	0.003 (0.003)	0.004 (0.003)
N	228364	440365	495874
Panel 2: Falsificación			
SM SXXI	0.000 (0.023)	0.002 (0.017)	0.001 (0.018)
N	44017	85298	94908

Notes: This table presents the impact of SMSXXI on infections during hospital stay. Outcome is a dummy variable which takes the value 1 if the discharge reports an infection during stay. First panel reports main results, and the second panel shows a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the state and year level. Standard errors are clustered at the health jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D14: Impact of SMSXXI on probability of discharge due to decease

	First week (1)	First month (2)	First year (3)
Panel 1: Main results			
SM SXXI	-0.004 (0.005)	0.005 (0.004)	0.005 (0.004)
N	253549	487722	549237
Panel 2: Falsification			
SM SXXI	0.034 (0.030)	0.017 (0.029)	0.015 (0.026)
N	44135	85480	95115

Notes: This table presents the impact of SMSXXI on discharges due to decease. Outcome is a dummy variable which takes the value 1 if the discharge occurs due to patient death. First panel reports main results, and the second panel shows a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the state and year level. Standard errors are clustered at the health jurisdiction level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D15: Impact of SMSXXI on post-partum complications

	Main (1)	TC 99% (2)	TC 95% (3)	2001-2013 (4)	2001-2006 (5)
SM SXXI	-0.573**	-0.606**	-0.585**	-0.596**	
	-0.252	-0.24	-0.235	-0.253	
Falsification					-0.212
					-0.299
N	448	448	448	416	192

Notes: This table presents the impact of SMSXXI on the discharge rate due to post-partum complications per 1000 living births. Unless otherwise stated, estimates use state level weights. Weights are the population of women in fertile age for each state according to the 2010 Mexican Census. SMSXXI is a variable indicating the percentage of population under 5 years of age living in health jurisdictions with access to SMSXXI. Column 1 presents main results, Columns 2 and 3 report results with top-coding on the outcome variable, Column 4 disregards the last year of data, and Column 5 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the state and year level. Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D16: Impact of SMSXXI on T-conditions (CIE-10)

	Main	TC 99%	TC 95%	2001-2013	2001-2006
	(1)	(2)	(3)	(4)	(5)
SM SXXI	-0.025 (0.034)	-0.023 (0.034)	-0.028 (0.032)	-0.018 (0.032)	
Falsification					-0.084* (0.043)
N	448	448	448	416	192

Notes: This table presents the impact of SMSXXI on the discharge rate due to external causes per 1000 people. SMSXXI is a variable indicating the percentage of population under 5 years of age living in health jurisdictions with access to SMSXXI. Column 1 presents main results, Columns 2 and 3 report results with top-coding on the outcome variable, Column 4 disregards the last year of data, and Column 5 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the state and year level. Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D17: Impact of SMSXXI on S-conditions (CIE-10)

	Main	TC 99%	TC 95%	2001-2013	2001-2006
	(1)	(2)	(3)	(4)	(5)
SM SXXI	-0.047 (0.086)	-0.054 (0.083)	-0.061 (0.080)	-0.037 (0.084)	
Falsification					-0.095 (0.072)
N	448	448	448	416	192

Notes: This table presents the impact of SMSXXI on the discharge rate due to external causes per 1000 people. SMSXXI is a variable indicating the percentage of population under 5 years of age living in health jurisdictions with access to SMSXXI. Column 1 presents main results, Columns 2 and 3 report results with top-coding on the outcome variable, Column 4 disregards the last year of data, and Column 5 performs a falsification exercise where we set the start of the program 6 years back and restrict the sample to pre-treatment years (2001-2006). All estimates include fixed effects at the state and year level. Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D18: Impact of SMSXXI on mortality per 1000 living births

	First week (1)	First month (2)	First year (3)
Panel 1: Main Results			
SMSXXI	-0.023 (0.028)	-0.139** (0.055)	-0.146** (0.064)
N	16940	16940	16940
Panel 2: Top coding 99%			
SMSXXI	-0.023 (0.028)	-0.139** (0.055)	-0.146** (0.064)
N	16940	16940	16940
Panel 3: Sub-sample 2005-2013			
SMSXXI	-0.027 (0.028)	-0.145*** (0.054)	-0.152** (0.064)
N	15730	15730	15730
Panel 4: Falsification			
SMSXXI	0.021 (0.028)	-0.018 (0.060)	-0.073 (0.067)
N	7260	7260	7260

Notes: This table reports main results, robustness checks and falsification exercises for the impact of SMSXXI on the mortality rate per 1000 living births. Columns report results for the first week, first month and first year of life. In all models, we use weights at the catalogue-jurisdiction level, where the weight is equal to the population under 5 years of age in each jurisdiction interacted with the number of mortalities during the first year of life in each state and for each catalogue for pre-treatment years. First panel shows main results; the second one top-codes values over the 99th percentile; third disregards the last year of data (2014) and the fourth panel shows a falsification exercise where we shift the full distribution of coverage at the jurisdiction level and catalogues six years back (2001-2006). Standard errors are clustered at the state level, and they are presented in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table D19: Impact of SMSXXI on height z-score

Analysis Sample	Full Sample	Low Marginalization	High Marginalization	Falsification
	(1)	(2)	(3)	(4)
SMSXXI	0.087*** (0.003)	0.059*** (0.003)	0.181*** (0.006)	0.0006 (0.005)
FE	T-AS-E	T-AS-E	T-AS-E	T-AS-E
N	9699756	7355295	2344461	4641962

Notes: This table presents results for the impact of SMSXXI on standardized height, taking the Growth Reference Pattern Study (2006) as the standardization. In all models, we include fixed effects for the year of birth (T), state of residence (E) and the full set of interactions between the age in months and sex (AS). First column presents main results, Column 2 considers schools with a low marginalization level, Column 3 high marginalization schools, and Column 4 performs a falsification exercise where we set the start of the program rollout (2007) in the last pre-treatment year (2006), and consider only children born from 2004 to 2006. Standard errors are clustered at the school level. Standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01