“Impact evaluation of *Seguro Popular* on the use of health services, health status and out-of-pocket health expenditure”

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Background

Background

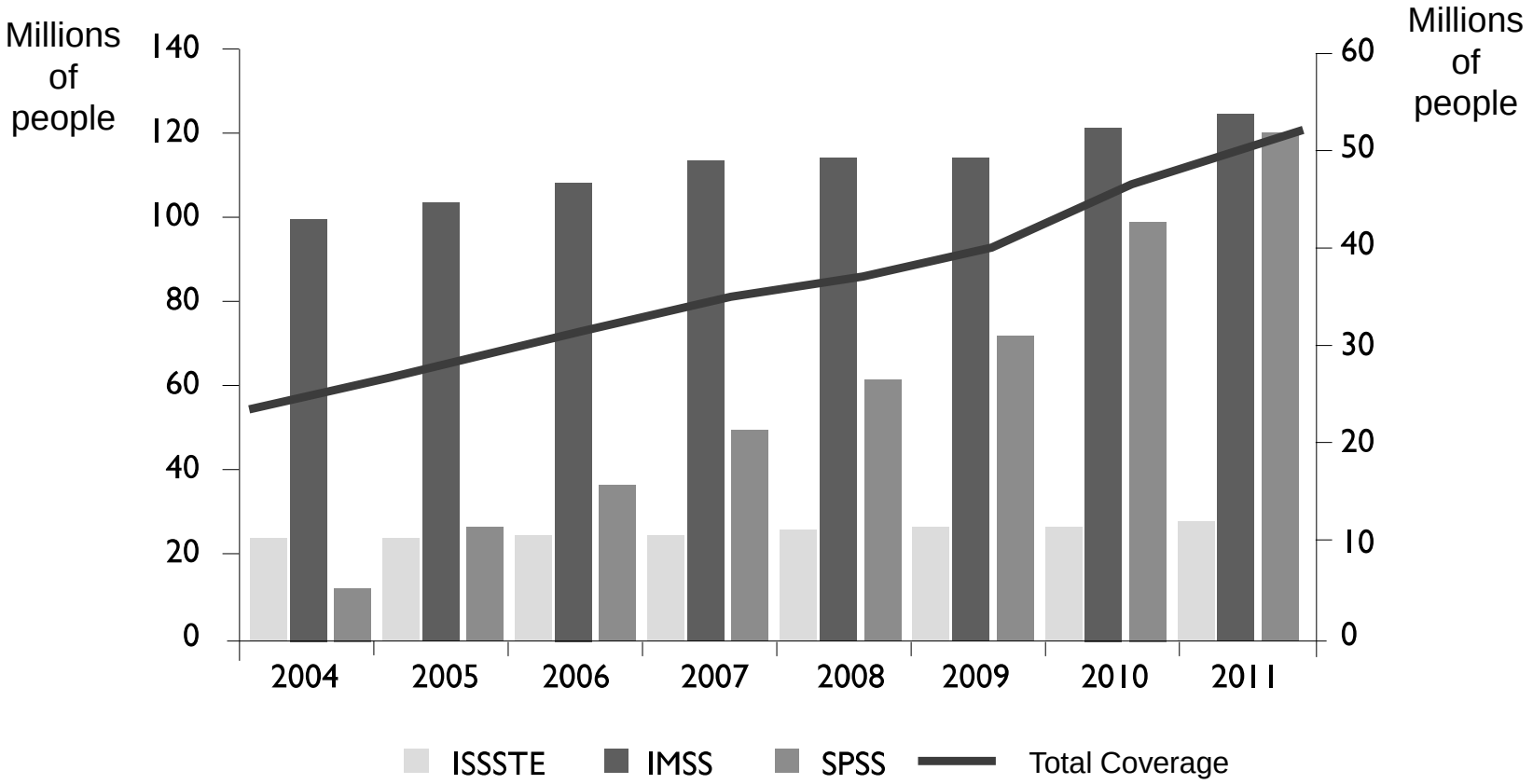
- By 2000, 50 million of the Mexican population did not have health insurance

  => Catastrophic health expenditures were covered directly by the uninsured affecting the poorest families.

- *Seguro Popular* (SP) represents the effort of the Mexican government to:
  - Reduce catastrophic health expenditures.
  - Reduce health inequalities → Improve health status of the uninsured.
- Government goal to reach by 2012 universal coverage.

Background

Fig1. Number of individuals affiliated to the three main public health institutions in Mexico



Source: Fundación Mexicana para la Salud, *"Universalidad de los servicios de salud en México"*, Salud Pública de México, Vol. 55 (2013)

Study Objective

- Since SP is close to achieve the goal of universal coverage, we evaluate the impact of SP on:
  - Health services utilization
  - Health Status
  - Out-of-pocket health expenditure
- Using longitudinal data from the Mexican Family Life Survey (MxFLS) implemented in 2002 and 2009-2011.

Previous Research

- Health services utilization
  - Based on observational studies that compare the uninsured with SP beneficiaries, results indicate higher utilization rates among SP beneficiaries (e.g.Gakidou et al. 2006, Scott 2006).
  - Based on longitudinal data from waves 1 and 2 of the MxFLS, the evidence indicates no impact in health care utilization, with the exception of SP beneficiary women living in urban areas (Arenas et al. 2013).
  - Based on a experimental design, the evidence indicates no impact on health care utilization (King et al. 2009).

Previous Research

- Out-of-pocket health expenditure
  - In general, the evidence shows a protective effect of SP against catastrophic health expenditure (e.g. King et al. 2009, Gakidou et al. 2006, Scott 2006).
  - Using the MxFLS 2002 and 2005, no effects on catastrophic health expenditures (Arenas et al. 2013).
  - Reduction in health expenditures in medicines, outpatient care (e.g. Galárraga 2008).

Previous Research

- Health status
  - Based on a experimental design, the evidence indicates no impact on health status (King et al. 2009)
  - Based on the MxFLS 2002 and 2005, the evidence shows no impact in diabetes, arthritis, migraine, obesity, and heart disease; however, it shows a reduction in cholesterol levels and days off work related to temporary illness (Parker and Rubalcava 2010).

Data and Methods

Data

- Mexican Family Life Survey (MxFLS)
  - Probabilistic, stratified, and multi-staged sample of the Mexican household in 2002
  - Representative at the national, urban, rural and regional levels
  - Sample size 35,000 individuals, 8,440 households in 150 communities and 16 states
  - All baseline respondents are followed up; and each wave new household members are added into the sample.
  - MxFLS-1 (2002), MxFLS-3 (2009-2011)
  - Re-contact rates between waves is about 90%

Data

- Multi-purpose survey
  - Affiliation to social programs
  - Socio-economic and demographic characteristics
  - Self-reported health measures, biomarkers
  - Insurance condition
  - Health care utilization
  - Health expenditures

Data

- Advantages of using MxFLS
  - Baseline was conducted in 2002, before the period in which SP was expanded, and covers until 2009-2011, almost the year in which the government plans to achieve universal coverage.
  - Provides socio-economic and demographic characteristics of the individuals before the implementation of the program, which can be used as controls to analyze the impact of the programs.
  - Provides information on several health outcomes before and after the implementation of the program.

Hypotheses

	Hypothesis 1		
Health services utilization	SP Beneficiaries	>	Non-beneficiaries eligible for coverage
	Hypothesis 2		
Health Status	SP Beneficiaries	> <	Non-beneficiaries eligible for coverage
	Hypothesis 3		
Out-pocket health expenditure	SP Beneficiaries	<	Non-beneficiaries eligible for coverage

Methods

- Difference-in-Difference Propensity Score Matching
  - Estimate propensity scores

$$P(X_i) = Pr\ (D_i = 1 | X_i) \qquad (1)$$

Xi Observable characteristics before treatment
Di =1 if at least one household member is a beneficiary of the SP

  - Match propensity scores
  - Estimate difference-in-Differences

$$ATT_{DD} = E(Y_1 - Y_0 | T_1 = 1) - E(Y_1 - Y_0 | T_1 = 0) \qquad (2)$$

Outcomes

- Health services utilization
  - Assisted to the doctor during the last 4 weeks
  - Number of visits to the doctor
  - Hospitalization within the last 12 months
  - Affiliation to IMSS
  - Affiliation to ISSSTE
- Biomarkers and anthropometric measures
  - Height, weight, BMI, Overweight (30> BMI>25), Obesity (BMI>30), Hip, Waist, Blood pressure, High Blood Pressure, Hypertension, Hemoglobin (g/dL)

Outcomes

- Health measures
  - Perceived Health
    - Self-rated health, Relative Self-rated health
  - Short-term health within the last 4 weeks (e.g. had fever, cough, allegies, etc)
- Chronic conditions
  - Diabetes, Heart Disease, Cancer, Arthritis, Migraine, etc.
- Activities of Daily Living (for adults>=50)
  - Can carry a pail, can walk 5 km, can stand up, etc.

Outcomes

- Health expenditure
  - Total household health expenditure reported by one household member.
  - On Self-treatment (e.g. over the counter medicines, herbs)
  - On chronic conditions
  - On pregnancy related issues
  - On contraceptive methods
  - On external consultation
  - On hospitalizations

Empirical Analysis

- Individual level analysis
  - Adults 20 to 60 years old
    - Stratified by rural/urban, and gender
    - We calculate 4 logistic regressions to estimate PS (rural men, rural women, urban men, urban women)
    - Outcomes
      - ✓ Health Service Utilization
      - ✓ Health Status
  - Children 0 to 5 years old
    - National
    - Outcomes
      - ✓ Health Service Utilization
      - ✓ Health Status

Empirical Analysis

- Household level analysis
  - National, stratified by rural, urban
  - We estimate 3 logistic regressions (National, rural, urban)
  - Outcomes
    - ✓ Out-of-pocket health expenditures

Propensity Score Estimations

Results – Propensity Score Estimation

- Independent variables (pre-treatment characteristics)
  - Demographics
    - Age, Education, Marital Status
  - Health
    - Health Insurance (i.e. IMSS, ISSSTE), Sick Leave
  - Economic Conditions of the Household
    - Household Assets, Dwelling conditions, Quarterly Health Expenditure
  - Household Participation in *Oportunidades*
  - Household Indigenous Status

Results – Propensity Score Estimation

Table1. Signs of Coefficients from PS estimation for adults 20-60 years old

	Urban		Rural	
	Female	Male	Female	Male
No-Instruction	+		-	
Being Separated vs. Married		-		
Medical Insurance	-	-	-	-
Sick Leave		+		
A household member owns the household dwelling	+	+		
A household member owns a car	-	-		
Dwelling with phone line	-	-	-	-
Poor Dwelling Conditions	+	+		
Household with Oportunidades	+	+	+	+
N	4,108	3,362	3,099	2,638

Difference-in-Differences PSM

Results

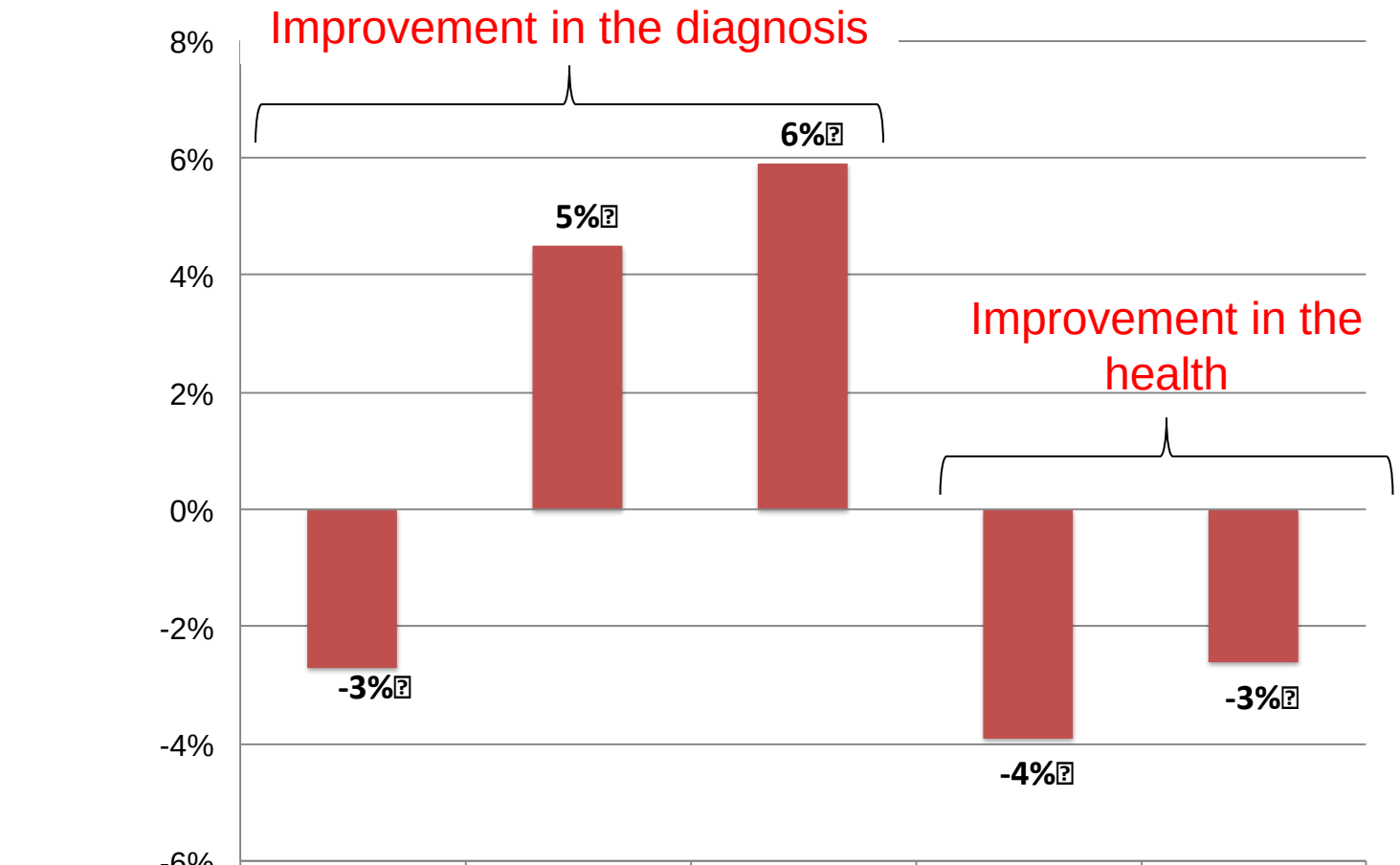
- Health services utilization
  - Increase of 47% in the number of visits to the doctor of SP beneficiary women living in urban areas.
  - Increase of 6% in the probability of visiting a doctor in the case of SP beneficiary men living in rural areas.
  - No impact for children from 0 to 5 years old.

Results

- Anthropometric measures and biomarkers
  - Increase of 1.3 cm in the hip measurement of SP beneficiary adult men age 20-60 living in urban areas.
  - Increase of 1.7 cm in waist measurement of SP beneficiary adult women age 20-60 living in rural areas.

Results

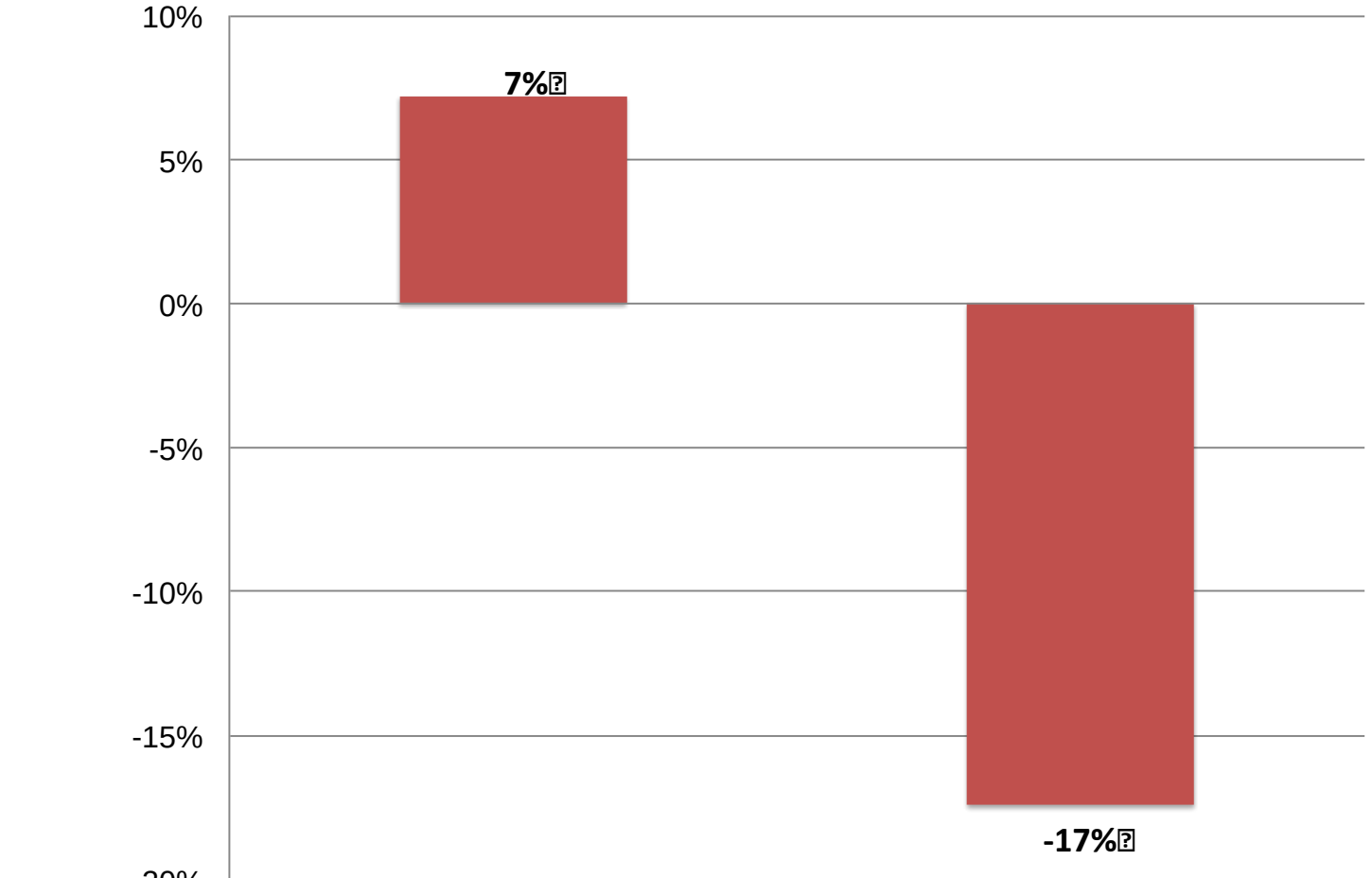
Graph1. Impact of SP on **Health Status of Urban Women** 20-60 years old



	Relative Self-Reported Health	Fever	Urinating Frequency	Blood Pressure Problems	Arthritis or rheumatism
Urban Women	-3%	5%	6%	-4%	-3%

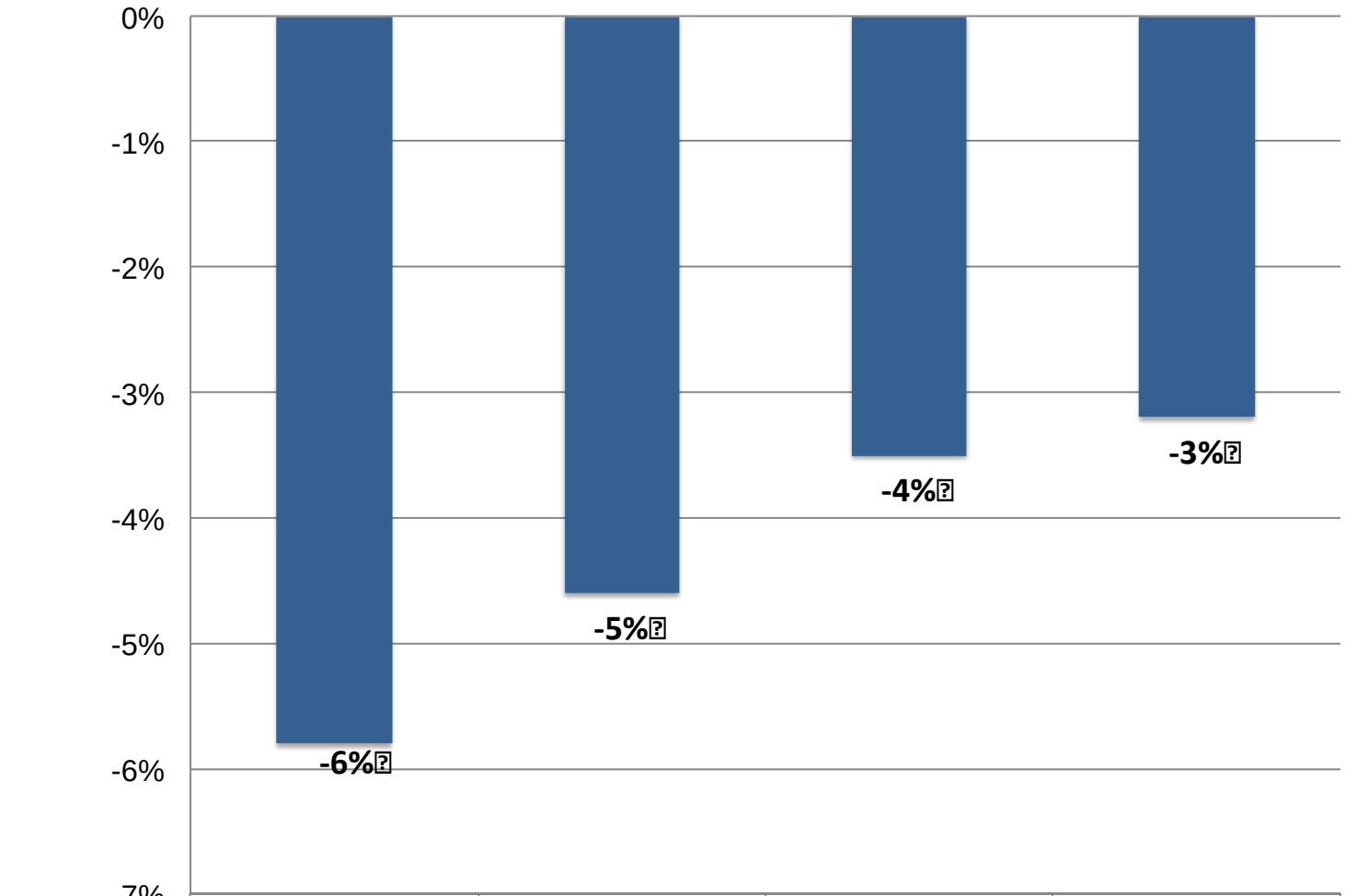
Results

Graph2. Impact of SP on **Health Status of Rural Women** 20-60 years old



Results

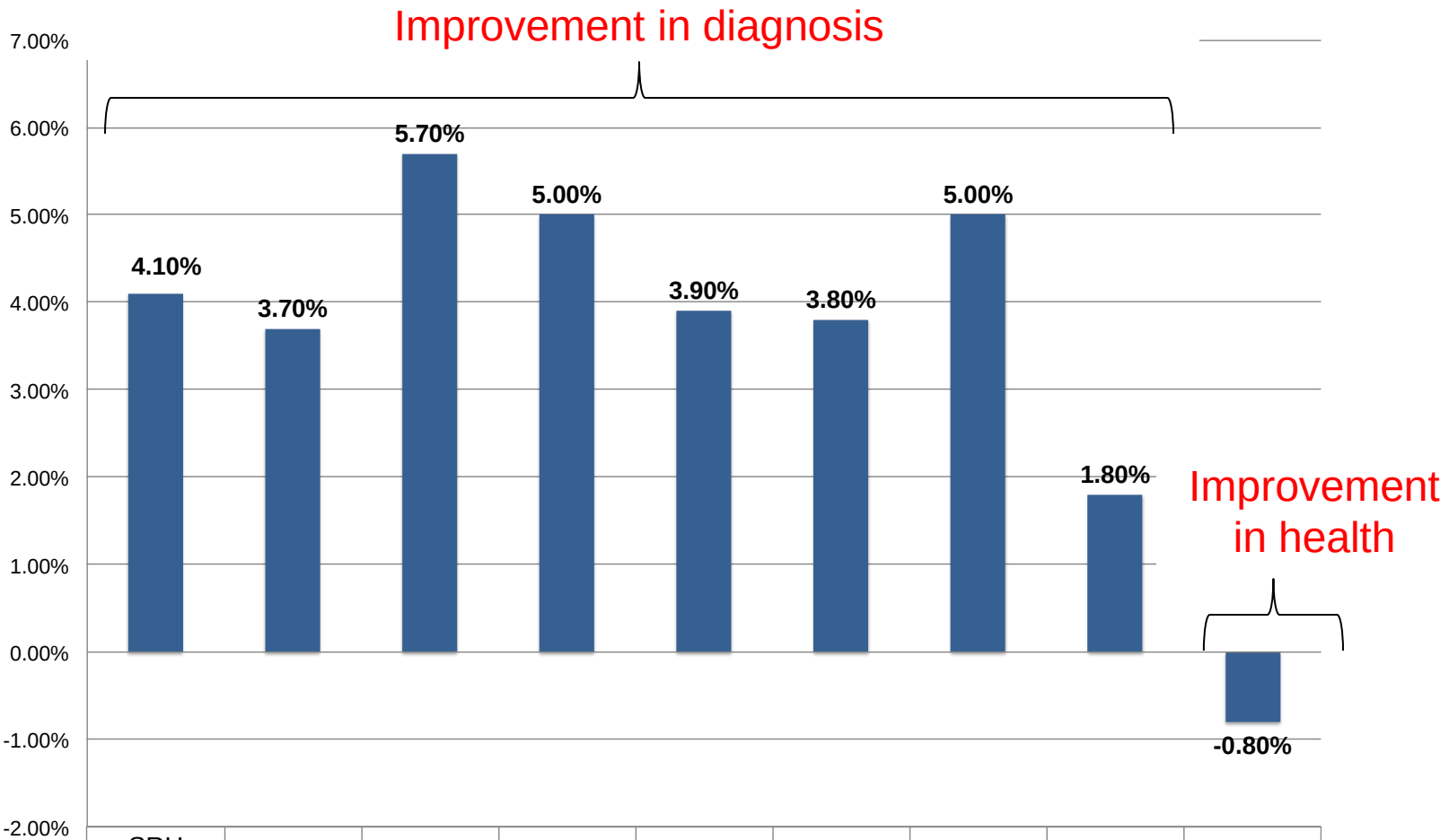
Graph3. Impact of SP on **Health Status of Urban Men** 20-60 years old



	Cold	Cough	Abdominal pain	Heart Disease
Urban Men	-6%	-5%	-4%	-3%

Results

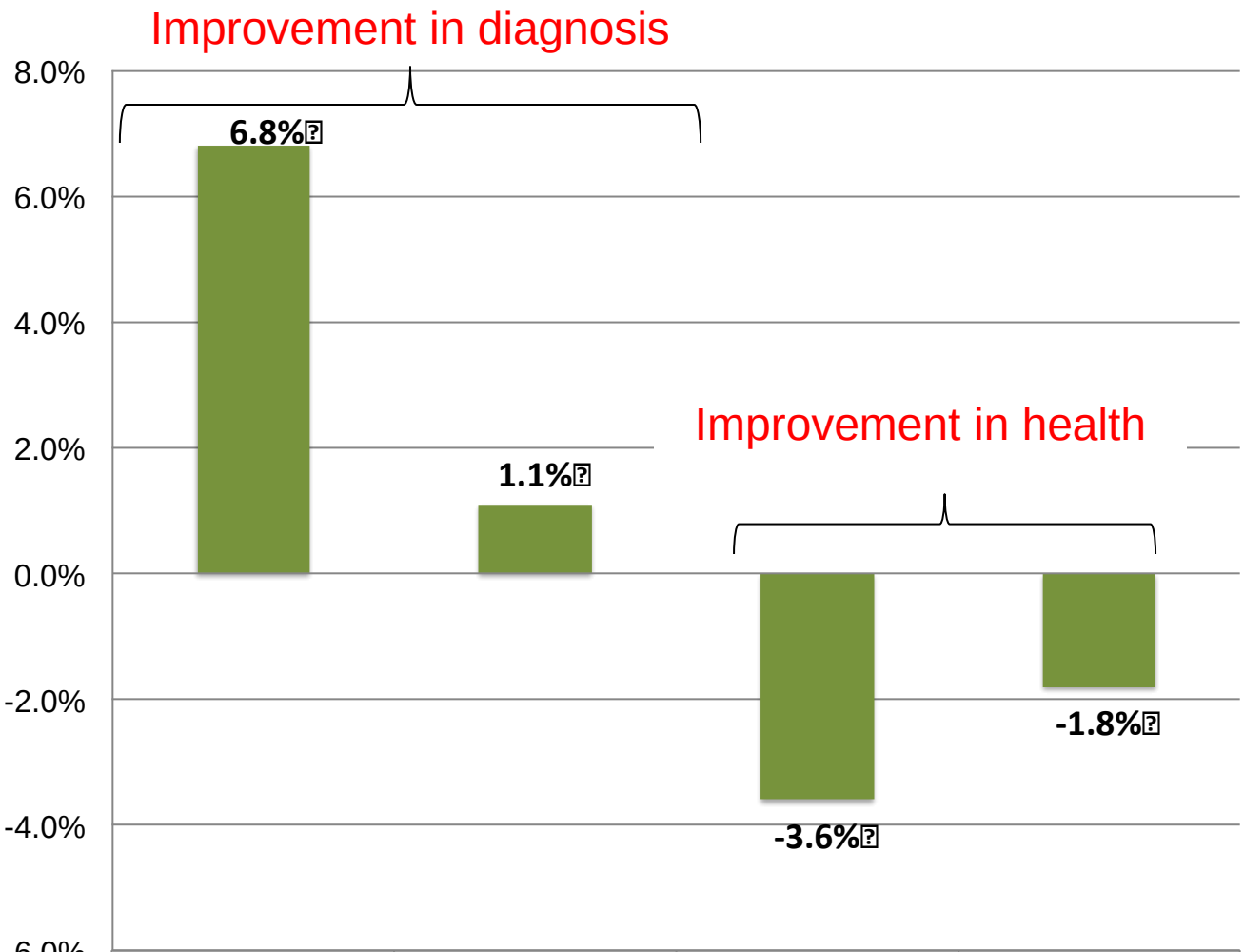
Graph4. Impact of SP on **Health Status of Rural Men** 20-60 years old



	SRH (Bad, Very Bad)	Sick Leave	Cough	Abdominal pain	Nauseas	Dental Pain	Chest pain	Allergies	Cancer
Rural Men	4.10%	3.70%	5.70%	5.00%	3.90%	3.80%	5.00%	1.80%	-0.80%

Results

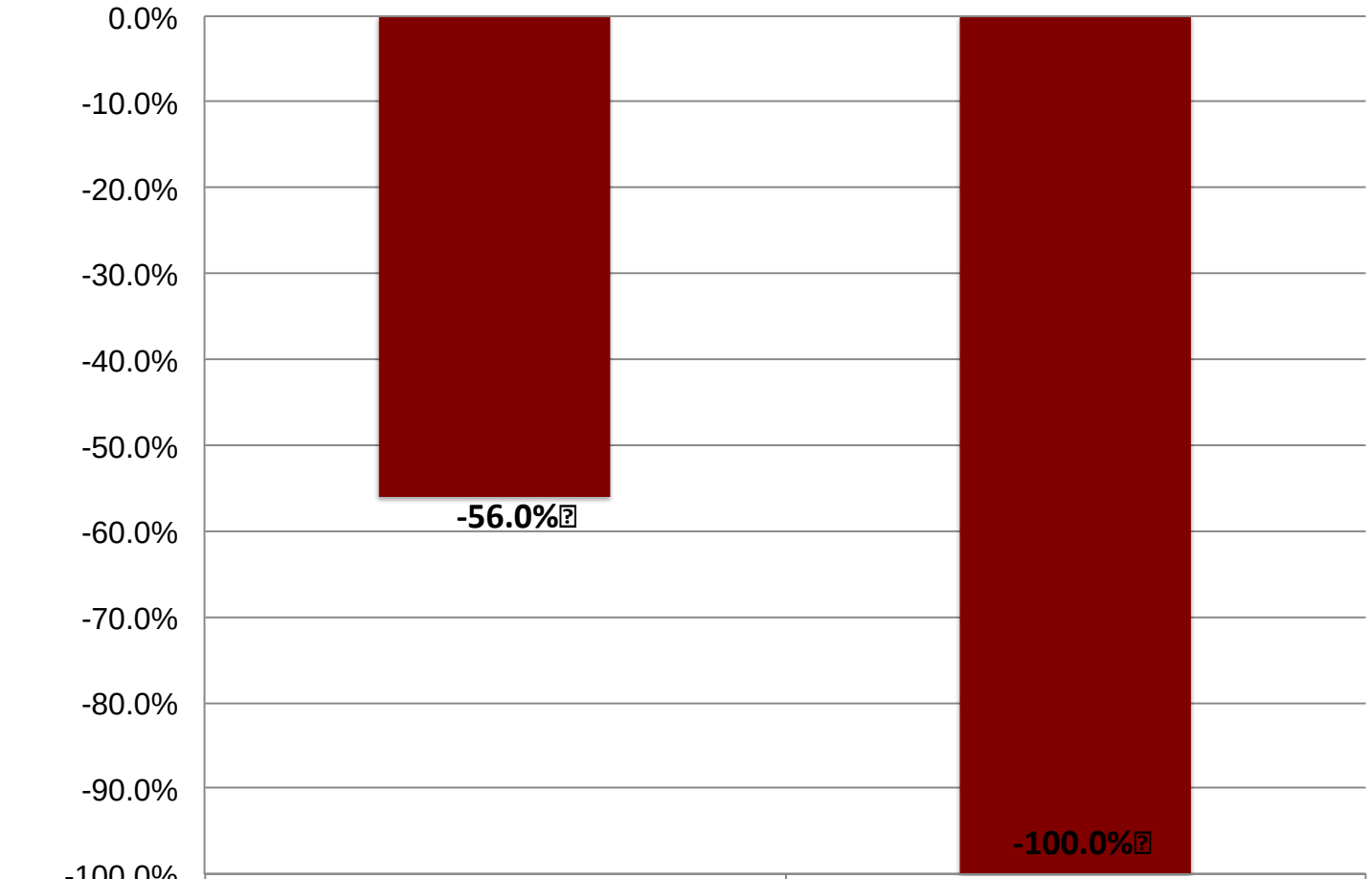
Graph5. Impact of SP on **Health Status of Children** 0-5 years old



	Amoebas/ Intestinal worms	Seizures	Flat foot	Other chronic conditions
Children 0-5 yrs.	6.8%	1.1%	-3.6%	-1.8%

Results

Graph6. Impact of SP on **Out-of-Pocket Household Health Expenditure**



Conclusion

Conclusion

- Hypothesis 1:
  - We find positive impacts in terms of health services utilization only for urban women and rural men.
- Hypothesis 2:
  - In the case of short-term health, SP has improve detection and diagnosis for urban women and rural men
  - In the case of chronic conditions, we observe an improvement in health status for urban women, rural men, and children.
- Hypothesis 3.
  - We find that SP has reduced household health expenditure.

Conclusion

- Limitations:
  - Since universal coverage will be attained by 2012, and the MxFLS-3 was fielded in 2009-2011, our study still does not include some individuals who are currently enrolled in the program. Subsequent waves of the MxFLS will be able to capture the total effect of the SP on the population.

THANK YOU.

Questions or Comments?

Additional Slides

Sample Sizes – Estimation of PS

Table 1. Sample Sizes for the Analyses at the Individual Level

	Affiliation to SP	*Adults 20-60 yrs*		*Children 0-5 yrs.*	
National Level	Beneficiaries	4,314	33%	1,361	39%
	Non-Beneficiaries	8,893	67%	2,157	61%
	Total	13,207	100%	3,518	100%
Urban - Male	Beneficiaries	696	21%		
	Non-Beneficiaries	2,666	79%		
	Total	3,362	100%		
Urban - Female	Beneficiaries	897	22%		
	Non-Beneficiaries	3,211	78%		
	Total	4,108	100%		
Rural - Men	Beneficiaries	1,239	47%		
	Non-Beneficiaries	1,399	53%		
	Total	2,638	100%		
Rural - Female	Beneficiaries	1,482	48%		
	Non-Beneficiaries	1,617	52%		
	Total	3,099	100%		

Sample Sizes – Estimation of PS

Table 2. Sample Sizes for the Household Level Analysis

	Affiliation to SP	*Household*	
National	Beneficiaries	2,191	31%
	Non-Beneficiaries	4,923	69%
	Total	7,114	100%
Urban	Beneficiaries	792	20%
	Non-Beneficiaries	3,178	80%
	Total	3,970	100%
Rural	Beneficiaries	1,399	44%
	Non-Beneficiaries	1,745	56%
	Total	3,144	100%

Resultados Adultos Urbano

Hombres					Mujeres			
Utilización Servicios de Salud	NN	DD	EE	Z	Utilización Servicios de Salud	DD	EE	Z
No se observan impactos significativos					Número de visitas al medico	0.488	0.229	2.13
						0.476	0.195	2.44
						0.296	0.176	1.68
Condiciones de Salud	NN	DD	EE	Z	Condiciones de Salud	DD	EE	Z
Biomarcadores o Medidas de Salud Cadera (cm)	1	-1.76	0.874	-2.02	Percepción del Estado de Salud	-0.072	0.035	-2.03
	2	-1.21	0.641	-1.89	Buena salud	-0.037	0.031	-1.2
	4	-1.28	0.593	-2.16	comparada con otros de la misma edad y género (buena y muy Buena)	-0.027	0.029	-0.95
Estado de Salud Padeció gripa	1	-0.058	0.034	-1.71	Estado de Salud Padeció fiebre	0.045	0.025	1.76
	2	-0.051	0.03	-1.7		0.036	0.021	1.68
	4	-0.04	0.028	-1.41		0.032	0.02	1.56
Estado de Salud Padeció tos	1	-0.04	0.031	-1.3	Estado de Salud Va al baño con frecuencia	0.059	0.032	1.85
	2	-0.045	0.027	-1.68		0.033	0.027	1.23
	4	-0.046	0.025	-1.83		0.036	0.024	1.49
Estado de salud Padeció dolor de estómago	1	-0.018	0.025	-0.73	Estado de Salud Padeció de la presión arterial	-0.017	0.022	-0.8
	2	-0.026	0.022	-1.19		-0.025	0.019	-1.33
	4	-0.035	0.021	-1.66		-0.039	0.018	-2.19
Enfermedades Crónicas Padece problemas del corazón	1	-0.038	0.013	-2.75	Estado de Salud Padeció artritis o reumatismo	-0.026	0.014	-1.86
	2	-0.037	0.011	-3.2		-0.015	0.012	-1.18
	4	-0.032	0.01	-3.19		-0.012	0.011	-1.02

Resultados Adultos Rural

Hombres					Mujeres			
Utilización Servicios de Salud	NN	DD	EE	Z	Utilización Servicios de Salud	DD	EE	Z
Asistió al médico en las últimas 4 semanas	1	0.042	0.026	1.62	No se observan impactos significativos			
	2	0.053	0.023	2.3				
	4	0.058	0.021	2.69				
Condiciones de Salud	NN	DD	EE	Z	Condiciones de Salud	DD	EE	Z
Percepción del Estado de Salud Percepción mala (mala y muy mala)	1	0.04	0.16	2.37	Biomarcadores o Medidas de Salud Cintura (cm)	2.021	0.697	2.9
	2	0.037	0.014	2.59		1.919	0.603	3.18
	4	0.041	0.013	3.01		1.703	0.524	3.25
Estado de Salud Dejó de trabajar por enfermedad	1	.040	.019	2.06	Percepción del Estado de Salud Buena salud comparada con otros de misma edad y género (buena y muy buena)	0.048	0.03	1.56
	2	.035	.017	2.08		0.07	0.028	2.52
	4	.037	.016	2.21		0.072	0.025	2.84
Estado de Salud Padeció tos	1	0.059	0.031	1.86	Estado Salud (50 años y mayores) Puede pararse del suelo	-0.174	0.076	-2.27
	2	0.053	0.027	1.92		-0.121	0.071	-1.7
	4	0.057	0.025	2.27		-0.132	0.071	-1.87
Estado de salud Padeció dolor de estómago	1	0.05	0.027	1.81				
	2	0.037	0.024	1.52				
	4	0.037	0.022	1.64				
Estado de salud Padeció nauseas	1	0.039	0.022	1.75				
	2	0.006	0.017	0.36				
	4	0.000	0.016	-0.02				
Estado de Salud Padeció dolor de dientes o muelas	1	0.036	0.03	1.2				
	2	0.032	0.025	1.28				
	4	0.038	0.022	1.66				
Estado de Salud Padeció dolor de pecho	1	0.05	0.022	2.22				
	2	0.03	0.018	1.59				
	4	0.03	0.016	2.17				
Estado de Salud Padeció alergias	1	.018	.009	0.98				
	2	.018	.008	2.03				
	4	.013	.008	1.45				

Resultados Niños Nacional

Utilización Servicios de Salud	NN	DD	EE	Z
No se observan impactos significativos				
Condiciones de Salud	**NN**	**DD**	**EE**	**Z**
Estado de Salud Padeció lombrices o amibas	1	0.068	0.017	3.81
	2	0.05	0.015	3.35
	4	0.041	0.013	3.01
Estado de Salud Padeció convulciones	1	0.011	0.004	2.77
	2	0.008	0.003	2.41
	4	0.005	0.002	1.75
Enfermedades Crónicas Padece pie plano	1	-0.041	0.015	-2.65
	2	-0.036	0.013	-2.72
	4	-0.025	0.012	-2.07
Enfermedades Crónicas Padece otras enfermedades crónicas	1	-0.018	0.01	-1.77
	2	-0.012	0.009	-1.28
	4	-0.015	0.009	-1.62

Resultados Hogares

Gasto de bolsillo en salud trimestral	NN	DD	EE	Z
Nacional				
Gasto total del hogar en salud (reportado por un miembro del hogar)	1	-184.53	87.83	-2.1
	2	-165.97	87.77	-1.89
	4	-126.36	80.24	-1.57
Gasto en anticonceptivos	1	-7.27	7	-1.04
	2	-10.06	9.4	-1.07
	4	-15.78	8.11	-1.95
Urbano				
Gasto en enfermedades crónicas (niños)	1	51.24	61.59	0.83
	2	120.4	58.96	2.04
	4	114.33	57.58	1.99
Rural				
No se observan impactos significativos				

Results – Propensity Score Estimation

Table2. Signs of Coefficients from PS estimation for children 0-5 years old

	National
Household Head with No Instruction	+
Household Assets - Electronics	+
Dwelling with phone line	-
Poor Dwelling Conditions	+
At least one household member with Medical Insurance	-
Household with Oportunidades	+
N	3,518

Results – Propensity Score Estimation

Table3. Signs of Coefficients from PS estimation for households

	National	Urban	Rural
Household Head Age	∧	∧	
Household Head with No Instruction		+	
Household Head Widowed vs. Married		-	
Household Assets			
Bycicle	+		+
Car	-		
Electronics	+		
Dwelling with phone line	-	-	-
Poor Dwelling Conditions	+	+	+
Medical Insurance	-	-	-
Household Indigenous		-	+
Household with Oportunidades	+	+	+
N	7,114	3,970	3,144

∧ It increases for age groups until reaching 49 years and then it decreases for the older group