

Housing, Health & Happiness

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Housing along with food & water are considered basic needs

- Most countries devote substantial resources to
 - Slum upgrading
 - Improving housing quality
 - Existing housing & new housing
 - US spends more on housing than other welfare programs such as TANF (Olsen, 2003).
- Welfare effects
 - Quality of life and mental health
 - Environmental health
 - Air Quality, Parasites & Bacteria

Little work on welfare effects of housing: Economics

- Hedonic studies that estimate the market value of various housing improvements (e.g. Crane et al., 1997, Jimenez, 1983).
- CV/EV estimates of welfare gain from the parameters of household utility functions (e.g. Kaufman and Quigley 1987, Takeuchi et al., 2005).
- Katz et al. (2001) examine impacts of Δ s in residential neighborhoods on well being
 - families in high-poverty housing projects
 - received housing vouchers in random lottery

Health literature

- Thomson et al. (2001) Survey
- Critical of the existing literature
- Mainly cross-sectional correlations
- No experiments or quasi-experiments

Housing is a Priority in Mexico

- México allocates considerable resources for:
 - Housing for those without
 - Improving the quality of housing
 - Improving amenities (e.g. electricity, water, waste)
- Because
 - Housing key component of quality of life
 - Has effects on health and welfare
- Focus of new Gouvernement

Mexican program PISO FIRME:

- Replace dirt floors with cement
 - Dirt floors are a primary indicator of poverty
 - 13% (2.8 million) Mexican families live in houses with dirt floors
 - Almost all poor live in houses with dirt floors
- State of Coahuila
 - Northern Mexico
 - 5% had dirt floors in 2000



Preview of Results:

- Offering PISO FIRME increased cement floors
- Offering PISO FIRME on Child Health
 - Reduced diarrhea, parasites & anemia
 - Increased cognitive ability
- Offering PISO FIRME on Maternal Happiness
 - Reduced depression measure & perceived stress
 - Increased satisfaction with quality of life
- Having a cement floor had big effects

Today....

- Program
 - Characteristics
 - Objectives
- Analysis
 - Research questions
 - Identification strategy
 - Sampling & Measurement
- Results
- Conclusions

Program Characteristics

- Supply up to 50m sq of concrete
- Worth USD \$150
- Government supplies materials and family supplies labor
- Joint Fed/State Program
- Beneficiaries 2001-2005
 - 34,000 beneficiaries in Coahuila
 - 100% takeup
 - 284,000 nationwide

How the Program Works...

- Paso 1:

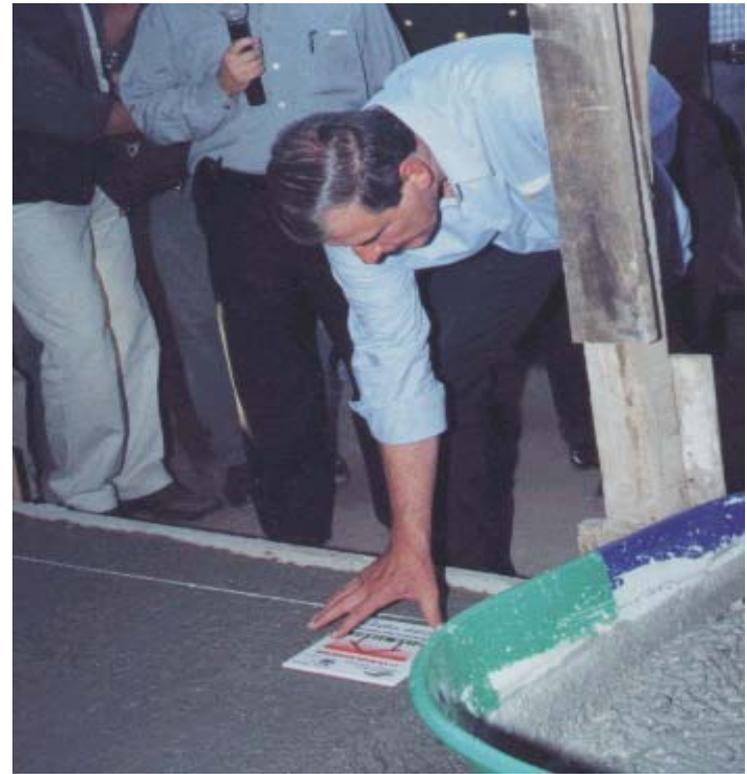


- Paso 2:



How the program works...

- After 4 hours...



Program Objectives I: Child Health

- **Interrupt transmission of parasitic infections**
(Walker et al, 1992 and Stephenson et al., 1990)
 - Parasites live in fecal matter
 - Dirt floors are hard to clean
 - Hard to see fecal matter on dirt floors
- **Expect large effect on young children**
 - Play on floors
 - Ingest fecal matter by putting hands in mouth
 - Don't understand consequences

Implications for child development

(Stephenson et al., 1990 and Gupta et al, 1997)

- Parasites are a major cause of gastrointestinal irritation and diarrhea
- Diarrhea reduces calorie absorption & physical growth
- Parasites also consume micronutrients, especially iron, which causes anemia
- Chronic anemia reduces cognitive development

Worldwide Intestinal Parasites Infect Over 3 Billion & Cause 3 Million Child Deaths

- Common interventions
 - Anti-worm drugs such as Ambendazol
 - Behavioral changes e.g wash hands
 - Safe water
- Mexico: Ambendazol
- Miguel & Kremer (2004) show deworming increased on school participation in Kenya.
- Ambendazol does not affect non-worm parasites i.e. amoeba / protozoa

Program Objectives II: Quality of life

- Question is how to measure it
 - unlikely to affect standard measures of welfare e.g. income/consumption
 - Willingness to pay (e.g. CV/EV/consumer surplus) from utility function estimates
 - Happiness (Di Tella & MacCulloch (2006); Kahneman & Krueger (2006))
- Happiness and mental health
 - Self-reported satisfaction with life
 - Depression
 - Stress

Ask Two Related Questions

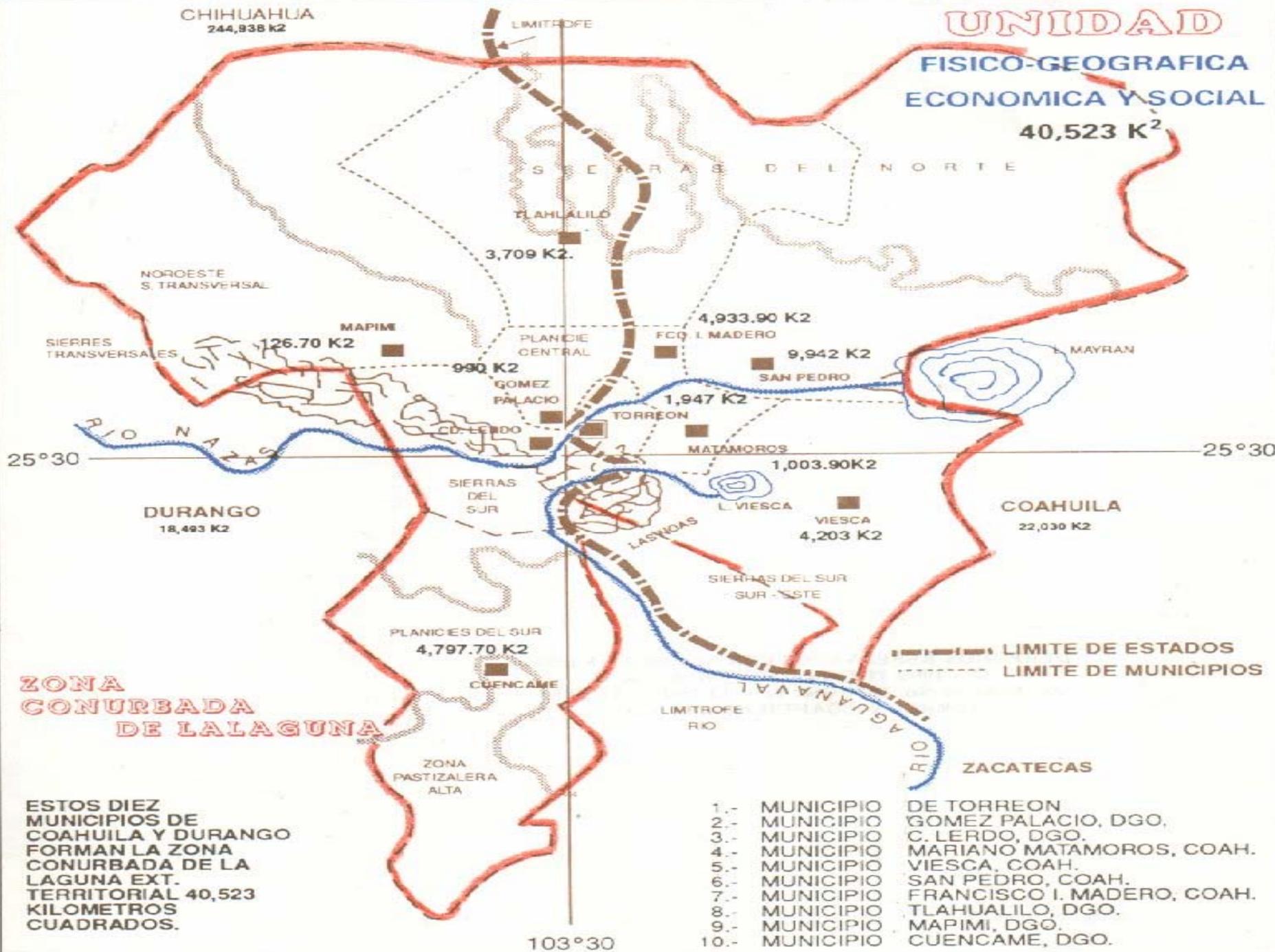
- Net effect of offering PISO FIRME
 - “Intent-to-Treat” (ITT) effects
- Effect of having hard floors
 - Use offering PISO FIRME as IV
 - LATE
- Outcomes of interest
 - child health and development
 - maternal happiness/mental health

Geographical Discontinuity

- State of Coahuila Implemented PISO FIRME, but neighbor Durango did not
- Twin cities of Torreón (Coahuila) and Gómez Palacios and Lerdo (Durango).
 - Separated by a river with many bridges
 - Effectively one city
 - Both have good municipal water & sewage
 - Both use Ambendozal to deworm
 - No other local child health/housing programs

CHIHUAHUA
244,938 K2

UNIDAD FISICO-GEOGRAFICA ECONOMICA Y SOCIAL 40,523 K²



25°30'

25°30'

DURANGO
18,493 K2

COAHUILA
22,039 K2

ZONA CONURBADA DE LALAGUNA

ESTOS DIEZ
MUNICIPIOS DE
COAHUILA Y DURANGO
FORMAN LA ZONA
CONURBADA DE LA
LAGUNA EXT.
TERRITORIAL 40,523
KILOMETROS
CUADRADOS.

103°30'

- | | |
|----------------|----------------------------|
| 1.- MUNICIPIO | DE TORREON |
| 2.- MUNICIPIO | GOMEZ PALACIO, DGO. |
| 3.- MUNICIPIO | C. LERDO, DGO. |
| 4.- MUNICIPIO | MARIANO MATAMOROS, COAH. |
| 5.- MUNICIPIO | VIESCA, COAH. |
| 6.- MUNICIPIO | SAN PEDRO, COAH. |
| 7.- MUNICIPIO | FRANCISCO I. MADERO, COAH. |
| 8.- MUNICIPIO | TLAHUALILO, DGO. |
| 9.- MUNICIPIO | MAPIMI, DGO. |
| 10.- MUNICIPIO | CUENCAME, DGO. |

--- LIMITE DE ESTADOS
- - - LIMITE DE MUNICIPIOS

LIMITROFE
RIO

ZACATECAS

Sampling Strategy

- 1500 Treatments from Torreón
 - Received PF btw 2001-2004, min 2 year exposure
 - Random sampling census radius
 - All beneficiaries on block w/kids < age 6
- 1500 Controls from Gómez Palacios & Lerdo
 - Matched census blocks based on
 - proportion of households with dirt floor in 2000,
 - number of children between 0 and 5 years old in 2000
 - number of households in 2000
 - % of families in poverty in 2000
 - households with dirt floor in 2000 & kids < age 6

Survey Content & Measurement

- demographics & socio-economic status,
- housing infrastructure including floor type of each room
- Hygiene environment & habits
- Children < age 6
 - health outcomes,
 - nutritional outcomes,
 - cognitive development.
- Maternal happiness and mental health,

Child Outcomes

- Maternal reported
 - Diarrhea
 - Respiratory, other diseases
- Two stool samples to test for parasites
 - 21 different types of worms & protozoa
- Blood to test for anemia
- Height & Weight
- Picture Peabody Vocabulary Test (age 3-5)
 - percentile Latin American distribution

Maternal Happiness

- Depression scale based on
 - Sum of responses to 15 depression related questions
- Perceived stress scale
 - Sum of responses to 7 questions
- Satisfaction with
 - Flooring
 - Housing
 - Quality of Life
 - =1 if satisfied or very satisfied

Analysis outline

- Survey response rates
- Sample Balance
- Effect of PISO FIRME on cement floors
- Child Health
 - Intent to Treatment
 - Treatment on Treated
- Maternal Happiness
 - Intent to Treatment
 - Treatment on Treated

Survey Response Rates

- Target sample size of 3,000 households
- Treatments
 - 92.6% response rate
 - 1,390 completed surveys
- Comparisons
 - 92.9% response rate
 - 1,393 surveys

Table II: Difference of Means for Census Variables

Variable	Treatment Mean	Control Mean	Mean Difference
<i>Proportion of blocks of houses with at least one house that has dirt floor</i>	0.573	0.612	-0.040
<i>Proportion of households with dirt floors</i>	0.173	0.189	-0.016
<i>Average number of children between 0 and 5 yrs of age</i>	0.710	0.721	-0.011
<i>Number of households</i>	511.292	488.989	22.303
<i>Number of people</i>	2241.586	2170.597	70.989
<i>Average number of rooms per household</i>	2.352	2.353	-0.002
<i>Average number of people per household</i>	4.326	4.448	-0.122
<i>Proportion of households with no water connection outside the house</i>	0.076	0.043	0.033
<i>Proportion of households with no water connection inside the house</i>	0.392	0.316	0.076
<i>Proportion of households with no water connection in the bathroom</i>	0.507	0.451	0.056
<i>Proportion of households with no gas heater</i>	0.028	0.029	-0.001
<i>Proportion of households with no refrigerator</i>	0.204	0.212	-0.007
<i>Proportion of households with no washing machine</i>	0.379	0.359	0.020
<i>Proportion of households with no telephone</i>	0.804	0.786	0.018
<i>Proportion of households with no vehicle</i>	0.735	0.734	0.000
<i>Average overcrowding index</i>	2.302	2.314	-0.012
<i>Proportion of households below the poverty line</i>	0.140	0.148	-0.009
<i>Proportion of households with illiterate members</i>	0.063	0.059	0.004
<i>Average years of schooling of head of household</i>	6.386	6.514	-0.128
<i>Average number of school dropouts among children aged 5 - 15 yrs</i>	0.180	0.172	0.007
<i>Average number of household members who work</i>	1.508	1.592	-0.084
<i>Average number of family members who earn an income</i>	1.422	1.495	-0.072
<i>Number of observations</i>	599	370	

Table III: Difference of Means for Independent Variables

Variable	Observations Treatment	Mean Treatment	Observations Control	Mean Control	Mean Difference
Household Demographics					
<i>Number of household members</i>	1390	5.312	1393	5.374	-0.063
<i>Head of household's age</i>	1390	37.469	1393	37.120	0.349
<i>Head of household's years of schooling</i>	1388	6.115	1391	6.408	-0.293
<i>Spouse's age</i>	1390	29.643	1393	28.772	0.871
<i>Spouse's years of schooling</i>	1233	6.311	1211	6.479	-0.168
Characteristics of Children Aged 0-5					
<i>Age</i>	1980	2.649	2112	2.579	0.071
<i>Male (=1)</i>	1980	0.491	2112	0.517	-0.025
<i>Mother present (=1)</i>	1980	0.959	2112	0.943	0.015
<i>Mother's age (if present)</i>	1898	27.388	1992	27.465	-0.077
<i>Mother's years of schooling (if present)</i>	1896	7.029	1992	6.910	0.119
<i>Father present (=1)</i>	1980	0.764	2112	0.722	0.042
<i>Father's age (if present)</i>	1512	30.347	1525	30.632	-0.286
<i>Father's years of schooling (if present)</i>	1508	6.826	1519	7.153	-0.326
Housing Characteristics					
<i>Number of rooms</i>	1390	2.081	1393	1.981	0.100
<i>Water connection (=1)</i>	1390	0.968	1393	0.977	-0.009
<i>Water connection inside the house (=1)</i>	1390	0.512	1393	0.546	-0.034
<i>Share of rooms with cement floors in 2000</i>	1390	0.329	1393	0.327	0.002
Hygienic Environment					
<i>Household has animals on land (=1)</i>	1390	0.516	1393	0.480	0.036
<i>Animals allowed to enter the house (=1)</i>	1390	0.192	1393	0.190	0.003
<i>Number of times respondent washed hands the day before</i>	1390	3.748	1393	3.716	0.032
Economic Characteristics					
<i>Proportion of household members who work</i>	1389	0.285	1393	0.274	0.012
<i>Household operates a microenterprise (=1)</i>	1385	0.106	1387	0.095	0.011
<i>Hours worked by household members per capita</i>	1389	14.452	1393	14.566	-0.114
<i>Total household income per capita</i>	1390	1406.056	1393	1874.333	-468.278
<i>Total value of household assets per capita</i>	1389	22413.900	1393	22032.320	381.580
<i>Total household consumption per capita</i>	1389	812.839	1393	998.296	-185.457
Public Social Programs					
<i>Household is a beneficiary of a public assistance program (=1)</i>	1390	0.374	1393	0.279	0.095
<i>Household is a beneficiary of a government nutritional program (=1)</i>	1390	0.151	1393	0.113	0.038
<i>Transfers per capita from government programs</i>	1389	16.304	1392	12.604	3.699

Regressions of Coverage Measures on Program Dummy

Dependent Variable	Mean Control Group	Model 1	Model 2	Model 3	Model 4	Model 5
<i>Share of rooms with cement floors</i>		0.201	0.198	0.201	0.202	0.205
		(0.011)***	(0.010)***	(0.010)***	(0.010)***	(0.010)***
		[0.021]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***
	0.728	27.664	27.177	27.671	27.691	28.165
<i>Cement floor in kitchen</i>		0.255	0.251	0.255	0.255	0.259
		(0.014)***	(0.014)***	(0.014)***	(0.014)***	(0.014)***
		[0.025]***	[0.022]***	[0.022]***	[0.022]***	[0.022]***
	0.671	37.944	37.389	37.945	37.962	38.636
<i>Cement floor in dining room</i>		0.21	0.208	0.212	0.212	0.218
		(0.014)***	(0.014)***	(0.014)***	(0.014)***	(0.014)***
		[0.026]***	[0.024]***	[0.024]***	[0.024]***	[0.025]***
	0.709	29.661	29.304	29.893	29.912	30.741
<i>Cement floor in bathroom</i>		0.101	0.096	0.1	0.101	0.104
		(0.013)***	(0.013)***	(0.013)***	(0.013)***	(0.013)***
		[0.022]***	[0.020]***	[0.019]***	[0.019]***	[0.019]***
	0.803	12.586	12.012	12.497	12.524	12.919
<i>Cement floor in bedroom</i>		0.239	0.24	0.243	0.243	0.245
		(0.015)***	(0.015)***	(0.015)***	(0.015)***	(0.015)***
		[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.021]***
	0.668	35.776	35.985	36.444	36.439	36.629

Notes:
 (i) Model 1: no controls; Model 2: age and demographic controls; Model 3: age, demographic and health-habits controls; Model 4: age, demographic, health-habits and economic controls; Model 5: age, demographic, health-habits, economic and federal-programs controls.
 (ii) Reported results for Model 1 through Model 5: estimated coefficient, robust standard error in parentheses, clustered standard error at census-block level in brackets and (coefficient/control mean) * 100. * significant at 10%; ** significant at 5%; *** significant at 1%.
 (iii) Missing values in covariates were imputed with zero, and a corresponding dummy variable was then added to the regressions.

Table V: Children's Health Measures
Regressions of Health Outcomes on Program Dummy - Children Aged 0 - 5

Dependent Variable	Mean Control Group	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Parasite count (all)</i>		-0.066	-0.072	-0.073	-0.073	-0.077	-0.078
		(0.031)**	(0.030)**	(0.030)**	(0.030)**	(0.030)**	(0.030)**
		[0.050]	[0.050]	[0.049]	[0.048]	[0.049]*	[0.049]*
	0.646	-10.255	-11.095	-11.263	-11.274	-11.902	-12.029
<i>Parasite count (without BH)</i>		-0.061	-0.061	-0.061	-0.061	-0.066	-0.065
		(0.022)***	(0.022)***	(0.022)***	(0.022)***	(0.022)***	(0.022)***
		[0.032]**	[0.032]**	[0.032]**	[0.031]**	[0.032]**	[0.032]**
	0.333	-18.217	-18.213	-18.417	-18.234	-19.940	-19.680
<i>Diarrhea</i>		-0.018	-0.015	-0.018	-0.018	-0.019	-0.019
		(0.011)*	(0.011)	(0.011)*	(0.011)*	(0.011)*	(0.011)*
		[0.009]*	[0.009]*	[0.009]**	[0.009]**	[0.009]**	[0.009]**
	0.142	-12.445	-10.890	-12.428	-12.800	-13.286	-13.604
<i>Anemia</i>		-0.083	-0.081	-0.080	-0.079	-0.081	-0.080
		(0.016)***	(0.016)***	(0.016)***	(0.016)***	(0.016)***	(0.016)***
		[0.028]***	[0.027]***	[0.027]***	[0.027]***	[0.027]***	[0.027]***
	0.426	-19.446	-18.932	-18.751	-18.660	-18.967	-18.864
<i>McArthur Communication Development Test score</i>		4.037	4.724	4.978	4.951	4.622	4.613
		(1.632)**	(1.389)***	(1.412)***	(1.412)***	(1.406)***	(1.406)***
		[1.650]**	[1.527]***	[1.582]***	[1.595]***	[1.578]***	[1.584]***
	13.354	30.230	35.376	37.273	37.073	34.613	34.545
<i>Picture Peabody Vocabulary Test percentile score</i>		2.476	2.777	2.787	2.694	2.892	2.956
		(1.276)*	(1.239)**	(1.241)**	(1.239)**	(1.246)**	(1.252)**
		[1.689]	[1.448]**	[1.452]**	[1.490]*	[1.470]**	[1.477]**
	30.656	8.077	9.058	9.090	8.789	9.434	9.642
<i>Height-for-age z-score</i>		0.005	-0.008	-0.008	-0.010	-0.003	-0.001
		(0.035)	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
		[0.043]	[0.039]	[0.039]	[0.039]	[0.038]	[0.038]
	-0.605	-0.784	1.285	1.289	1.588	0.500	0.161
<i>Weight-for-height z-score</i>		0.012	0.003	0.002	0.003	0.008	0.010
		(0.036)	(0.036)	(0.036)	(0.036)	(0.037)	(0.037)
		[0.034]	[0.035]	[0.035]	[0.035]	[0.036]	[0.036]
	0.125	9.900	2.383	1.586	2.218	6.035	8.245

Notes:

(i) Model 1: no controls; Model 2: age and demographic controls; Model 3: age, demographic and health-habits controls; Model 4: age, demographic, health-habits and economic controls; Model 5: age, demographic, health-habits, economic and federal-programs controls; Model 6: age, demographic, health-habits, economic, federal-programs controls, and nutritional Coahuila state-level program dummy.

(ii) Reported results for Model 1 through Model 6: estimated coefficient, robust standard error in parentheses, clustered standard error at census-block level in brackets and (coefficient/control mean) * 100. * significant at 10%; ** significant at 5%; *** significant at 1%.

(iii) Missing values in covariates were imputed with zero, and a corresponding dummy variable was then added to the regressions.

Table VI: Robustness Checks
Regressions of Health Outcomes on Program Dummy - Children Aged 0 - 5

Dependent Variable	Mean Control Group	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Respiratory diseases</i>	0.355	0.021 (0.015) [0.019]	0.020 (0.015) [0.018]	0.020 (0.015) [0.018]	0.020 (0.015) [0.018]	0.016 (0.015) [0.018]	0.017 (0.015) [0.018]
		5.812	5.594	5.533	5.562	4.485	4.753
<i>Skin diseases</i>	0.101	0.000 (0.009) [0.012]	0.001 (0.01) [0.012]	0.002 (0.01) [0.012]	0.001 (0.01) [0.011]	0.001 (0.01) [0.011]	0.000 (0.01) [0.011]
		0.080	1.099	1.743	1.337	0.646	0.274
<i>Other diseases</i>	0.041	0.005 (0.006) [0.009]	0.006 (0.006) [0.009]	0.006 (0.006) [0.009]	0.006 (0.006) [0.009]	0.006 (0.006) [0.009]	0.006 (0.006) [0.009]
		13.119	14.132	15.258	14.632	15.591	13.795
<i>Installation of cement floor</i>	0.530	0.376 (0.015)*** [0.028]***	0.373 (0.016)*** [0.028]***	0.373 (0.016)*** [0.028]***	0.373 (0.016)*** [0.028]***	0.370 (0.016)*** [0.029]***	0.370 (0.016)*** [0.029]***
		70.977	70.438	70.341	70.394	69.757	69.845
<i>Construction/expansion of sanitation facilities</i>	0.101	-0.017 (0.011) [0.015]	-0.020 (0.011)* [0.015]	-0.020 (0.011)* [0.015]	-0.020 (0.011)* [0.015]	-0.021 (0.011)* [0.015]	-0.022 (0.011)* [0.015]
		-17.021	-19.824	-19.498	-19.651	-21.153	-21.776
<i>Restoration of sanitation facilities</i>	0.045	-0.001 (0.008) [0.013]	-0.002 (0.008) [0.013]	-0.002 (0.008) [0.013]	-0.002 (0.008) [0.013]	-0.003 (0.008) [0.012]	-0.004 (0.008) [0.012]
		-3.156	-3.775	-3.667	-3.778	-7.662	-8.159
<i>Construction of ceiling</i>	0.159	0.028 (0.014)** [0.024]	0.021 (0.014) [0.024]	0.020 (0.014) [0.024]	0.020 (0.014) [0.024]	0.016 (0.014) [0.023]	0.017 (0.014) [0.023]
		17.821	13.231	12.590	12.512	10.321	10.561
<i>Restoration of walls</i>	0.111	0.012 (0.012) [0.017]	0.009 (0.012) [0.017]	0.010 (0.012) [0.016]	0.010 (0.012) [0.016]	0.009 (0.012) [0.016]	0.008 (0.012) [0.016]
		11.199	7.908	8.765	8.688	7.952	7.018
<i>Log of self-reported rental value of house</i>	5.918	0.035 (0.03) [0.040]	0.024 (0.029) [0.036]	0.032 (0.028) [0.032]	0.031 (0.028) [0.032]	0.041 (0.029) [0.032]	0.041 (0.029) [0.032]
		0.596	0.407	0.535	0.530	0.688	0.691
<i>Log of self-reported sale value of house</i>	10.491	-0.043 (0.047) [0.100]	-0.064 (0.042) [0.084]	-0.050 (0.041) [0.078]	-0.049 (0.041) [0.078]	-0.033 (0.042) [0.074]	-0.033 (0.042) [0.075]
		-0.413	-0.611	-0.481	-0.469	-0.315	-0.312
<i>Log total income of mothers of children 0 - 5 yrs</i>	7.690	-0.052 (0.056) [0.066]	-0.050 (0.056) [0.067]	-0.046 (0.055) [0.066]	-0.040 (0.052) [0.057]	-0.025 (0.053) [0.056]	-0.024 (0.053) [0.057]
		-0.673	-0.649	-0.603	-0.523	-0.331	-0.314
<i>Log total income of fathers of children 0 - 5 yrs</i>	8.123	-0.018 (0.026) [0.027]	-0.016 (0.027) [0.028]	-0.011 (0.027) [0.028]	-0.003 (0.025) [0.027]	0.002 (0.025) [0.026]	0.000 (0.025) [0.026]
		-0.218	-0.191	-0.137	-0.039	0.026	0.000

Table VII: Satisfaction and Maternal Mental Health Measures

Regressions of Satisfaction and Maternal Mental Health Measures on Program Dummy

Dependent Variable	Mean Control Group	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Satisfaction with floor quality</i>		0.221	0.215	0.216	0.215	0.217	0.219
		(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***
		[0.023]***	[0.022]***	[0.022]***	[0.022]***	[0.023]***	[0.023]***
	0.511	43.286	42.056	42.349	42.155	42.541	42.777
<i>Satisfaction with house quality</i>		0.095	0.084	0.083	0.083	0.084	0.087
		(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***
		[0.021]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***	[0.020]***
	0.605	15.670	13.886	13.792	13.760	13.916	14.355
<i>Satisfaction with quality of life</i>		0.111	0.100	0.099	0.098	0.099	0.100
		(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***	(0.018)***
		[0.022]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***	[0.019]***
	0.601	18.415	16.598	16.521	16.374	16.437	16.670
<i>Depression Scale (CES-D Scale)</i>		-2.207	-2.174	-2.180	-2.156	-2.204	-2.201
		(0.338)***	(0.339)***	(0.337)***	(0.336)***	(0.338)***	(0.339)***
		[0.616]***	[0.597]***	[0.586]***	[0.577]***	[0.561]***	[0.562]***
	18.532	-11.908	-11.730	-11.763	-11.633	-11.890	-11.875
<i>Perceived Stress Scale (PSS)</i>		-1.721	-1.679	-1.680	-1.669	-1.694	-1.683
		(0.254)***	(0.255)***	(0.255)***	(0.255)***	(0.254)***	(0.256)***
		[0.428]***	[0.406]***	[0.408]***	[0.404]***	[0.393]***	[0.394]***
	16.514	-10.421	-10.165	-10.172	-10.105	-10.259	-10.190

Table VIII: Children's Health Measures

Instrumental Variables Regressions - Instrument: Program Dummy

Dependent Variable	Overall Mean	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Parasite count (all)</i>		-0.315	-0.354	-0.352	-0.354	-0.369	-0.371
		(0.146)**	(0.148)**	(0.146)**	(0.147)**	(0.146)**	(0.145)**
		[0.229]	[0.242]	[0.233]	[0.231]	[0.229]*	[0.229]*
	0.613	-0.424	-0.476	-0.474	-0.476	-0.497	-0.499
<i>Parasite count (without BH)</i>		-0.289	-0.299	-0.297	-0.295	-0.319	-0.312
		(0.106)***	(0.109)***	(0.107)***	(0.107)***	(0.107)***	(0.106)***
		[0.146]**	[0.155]**	[0.150]**	[0.149]**	[0.150]**	[0.148]**
	0.302	-0.786	-0.816	-0.809	-0.804	-0.869	-0.851
<i>Diarrhea</i>		-0.081	-0.074	-0.082	-0.085	-0.087	-0.089
		(0.049)*	(0.051)	(0.050)*	(0.050)*	(0.050)*	(0.049)*
		[0.043]*	[0.043]*	[0.043]**	[0.043]**	[0.044]**	[0.043]**
	0.133	-0.493	-0.450	-0.501	-0.517	-0.530	-0.539
<i>Anemia</i>		-0.389	-0.393	-0.379	-0.378	-0.379	-0.374
		(0.075)***	(0.077)***	(0.075)***	(0.076)***	(0.075)***	(0.075)***
		[0.123]***	[0.123]***	[0.119]***	[0.120]***	[0.118]***	[0.117]***
	0.386	-0.819	-0.827	-0.798	-0.795	-0.798	-0.787
<i>McArthur Communication Development Test score</i>		17.980	22.331	22.076	21.913	20.447	20.408
		(7.431)**	(6.877)***	(6.576)***	(6.563)***	(6.496)***	(6.497)***
		[6.924]**	[6.942]***	[6.681]***	[6.708]***	[6.759]***	[6.770]***
	15.363	0.960	1.193	1.179	1.171	1.092	1.090
<i>Picture Peabody Vocabulary Test percentile score</i>		13.766	15.309	15.139	14.660	15.480	15.670
		(7.105)*	(6.899)**	(6.820)**	(6.820)**	(6.766)**	(6.734)**
		[9.147]	[8.166]**	[8.092]**	[8.304]*	[8.082]**	[8.026]**
	31.859	0.361	0.401	0.397	0.384	0.406	0.411

**Table IX: Satisfaction and Maternal Mental Health Measures
Instrumental Variables Regressions - Instrument: Program Dummy**

Dependent Variable	Overall Mean	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Satisfaction with floor quality</i>		1.099	1.087	1.075	1.069	1.061	1.060
		(0.090)***	(0.093)***	(0.091)***	(0.090)***	(0.089)***	(0.089)***
		[0.102]***	[0.101]***	[0.098]***	[0.098]***	[0.095]***	[0.093]***
	0.622	1.464	1.448	1.432	1.425	1.414	1.412
<i>Satisfaction with house quality</i>		0.471	0.425	0.414	0.412	0.410	0.420
		(0.088)***	(0.090)***	(0.089)***	(0.089)***	(0.088)***	(0.087)***
		[0.094]***	[0.093]***	[0.093]***	[0.093]***	[0.093]***	[0.093]***
	0.653	0.598	0.539	0.526	0.524	0.520	0.533
<i>Satisfaction with quality of life</i>		0.550	0.504	0.493	0.488	0.482	0.485
		(0.086)***	(0.088)***	(0.086)***	(0.086)***	(0.085)***	(0.085)***
		[0.095]***	[0.090]***	[0.090]***	[0.087]***	[0.088]***	[0.086]***
	0.656	0.694	0.637	0.622	0.616	0.608	0.613
<i>Depression Scale (CES-D Scale)</i>		-11.000	-11.025	-10.855	-10.728	-10.778	-10.695
		(1.717)***	(1.761)***	(1.719)***	(1.714)***	(1.695)***	(1.689)***
		[3.009]***	[2.956]***	[2.901]***	[2.852]***	[2.741]***	[2.736]***
	17.431	-0.523	-0.524	-0.516	-0.510	-0.512	-0.508
<i>Perceived Stress Scale (PSS)</i>		-8.582	-8.501	-8.354	-8.293	-8.276	-8.169
		(1.321)***	(1.346)***	(1.319)***	(1.316)***	(1.294)***	(1.289)***
		[2.195]***	[2.096]***	[2.109]***	[2.091]***	[2.014]***	[2.001]***
	15.654	-0.454	-0.450	-0.442	-0.439	-0.438	-0.433

Conclusions

- Piso Frime increased housing quality
- Housing quality important for welfare
 - Child health & development
 - Happiness
 - Cost-Effective relative to other interventions
- Housing interventions maybe important poverty interventions
- Cement floors as a parasite policy
 - Ambendosal works only against worms
 - Nothing similar for protozoa