

Mexico's *PROGRESA*:

Using a Conditional Cash Transfer
Program to Invest in Human Capital

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One of the Tragedies of Poverty is its Intergenerational Transmission

- *Children who grow up in poverty remain poor*
 - Poor invest less in children's health & education
- *Enter adulthood without “**basic capabilities**”*
 - Not able to take advantage of labor market opportunities
 - Less capable of pulling themselves out of poverty
 - Lower quality of Life



Health is a Critical “Capability”

- *Most Long-Term Poverty Alleviation Policies Focus on Schooling*
- *But, Health is also important*
 - Health & Nutrition in formative years affects growth & cognitive development
 - Healthier kids get more schooling & do better in school
 - Healthier adults have higher wages & higher quality of life



PROGESA Addresses Immediate & Long-Term Problems of Poverty

- *Cash transfer Immediate needs*
 - Hunger
 - Disease and illness
 - Living conditions
- *Break inter-generational transmission*
 - Invest in children's Education, Health & Nutrition
 - Improve children's "capabilities"
 - Pull themselves out of poverty
 - Lead a high quality of life



***PROGRESA* is an Incentive-Based Welfare PROGRAM**

- *Cash transfer is used as incentive to invest in human capital*
 - Education, Health & Nutrition
 - Cash conditional on staying in school, preventive health care, nutrition monitoring
- *Primarily focused on children*
 - Adults benefit as well (health)



PROGRESA is a Big Program

- *Rural Program 1997-2000*
 - 2.6 million families from 50,000 villages
 - 40% of rural families
- *Urban Expansion 2001-2003*
 - Added 2 million families
- *Annual Budget*
 - US\$2.6 Billion budget or 0.5% of GDP



Traditional Approaches to Improving Health

1. *Cash transfer Programs*

2. *Improving Programs*

- E.g. prenatal, family planning, nutrition monitoring & supplement, primary care...
- Access (travel time & prices)
- Availability & quality services
- Patient knowledge about availability and efficacy



Do Cash Transfer Programs Have an Impact on Health?

- *Assume problem is lack of income*
 - But, families may have other priorities for cash
- *Evidence?*
 - Currie (2000) finds no effect in US
 - Dulfo (2001) finds some effect in South Africa
- *Mixed evidence on income effect on health in developing countries*



Expanding Supply Has Less than Desired Effect

- *Mixed evidence these programs have impact*
 - No big increases in population health indicators
- *Problems:*
 - Low take-up rates
 - Selected program participation
 - Most needy least likely to choose to participate
 - Non-participants are ones who get no care
 - Participants substitute program for other care



PROGRESA Overcomes Problems of Traditional Approaches

- *Relaxes income constraint through cash transfer*
- *Provides financial incentive to use health services*
 - 97% take-up rate (Mexico's PROGRESA)
 - No selection effects
 - Those most in need get access to services



In Contrast to Traditional Approaches.....

- *We Find That PROGRESA....*
- *Improved child health*
 - Reduced hospital inpatient stays
 - Reduced morbidity
 - Taller & Less Anemia
- *Improved adult health*
 - Reduced hospital inpatient stays
 - Reduced illness days
 - Improved stamina



PROGRESA Also Overcame Political Economy Problem

- *Politicians reluctant to spend on investments that have long-term return*
 - e.g. child health & nutrition
 - Politicians come up for election before families fully benefit
- *Cash part of CCT attractive as yields short-run political payoff*



Use a Randomized Experiment to Evaluate Impact on Child Health

- *Randomized 506 rural villages into control and treatment groups*
- *After 18 Months Find that PROGRESA Improved child health as indicated by*
 - Reduced morbidity
 - Taller & Less Anemia
- *After 5 years find big effects on growth & physical health but little on cognitive develop.*



Presentation Outline

- *The Intervention*
 - *Targeting / Eligibility*
 - *Benefits*
- *Experimental Design*
- *Impact on Health After 18 Months*
- *Long-Term Impact on Health*
- *Lessons & Extensions*



Eligibility determined in 2 stages

1. *Identify poor communities*

- “marginality” index
- Infrastructure, demographics, etc.

2. *Identify poor households in each poor community*

- Proxy Means Test (PMT)
- Index of easily observed characteristics
 - Housing, education, family structure, Assets, etc
 - Characteristics & weights not common knowledge
- HH Census to collect characteristics



Enrollment

- *Went house to house to inform those eligible*
- *Achieved 97% take-up rate*
- *Receive benefits for 3 years*
- *Limited enrollment period,*
 - *After which, no new enrollment*
 - *Must wait 3 years for next enrollment period*
 - *Avoid migration problems*



Health Benefits Include...

- *Cash Transfer*
 - About 1/3 of mean “poor” income
 - Given to female head of household
 - Expected to be used to purchase food
 - 70% spent on more/better food (H&S, 2000)
- *To obtain cash, all family members have to get preventive health care*
- *Ensure clinics able to provide preventive care*



Specifically, To Obtain Cash...

- *Pregnant women must go to public health clinic for*
 - prenatal care beginning in 1st trimester
 - nutrition monitoring & supplements
 - **100% of daily required micronutrients & 20% of protein**
- *Lactating women must go to public health clinic for*
 - nutrition monitoring & supplements
- *Children 0-5 must go to public health clinic for*
 - Well baby & nutrition monitoring visits
 - Given nutritional supplements
 - **For age 0-24 months**
 - **For 24-60 months if poor nutrition detected**



Presentation Outline

- *The Intervention*

- ***Experimental Design***

- ***Random Assignment***

- ***Data Sources***

- *Impact on Health After 18 months*
- *Long-Term Impact on Health*
- *Lessons*



Another Unique Feature is the Rigorous Scientific Evaluation

- *Independent external evaluation gave credibility*
- *Complemented Operations*
 - Due to budget constraint & logistics problems
 - Not able to give benefits to all who are eligible in 1st year
 - Had to phase in program over 3 years
 - To be fair & equitable,
 - gave all eligible families equal chance of being 1st
 - Controlled Randomized Experiment
 - Treatment those who got program benefits first
 - Controls those who got program benefits 2 years later



Evaluation Design...

- *506 localities*
 - All have marginality index below poverty line
 - 2/3rds randomly assigned to receive program 1ST
 - 1/3 randomly assigned to receive program 2 yr.s later
- *Data*
 - Household panel surveys
 - Nutrition sub-sample



Household Survey

- *Sample of households*
 - PROGESA eligible (i.e. PMT below cutoff)
 - In both Treatment and Control localities
 - 14,500 households / 81,000 individuals
- *Surveyed*
 - At baseline before intervention
 - 4 times after at 6 month intervals
- *Nutrition sub-sample*
 - Kids 12-48 months in about ½ of the villages
 - Measured 12-18 month later after intervention began



Sample Attrition Rates From Baseline

No evidence of selective differential migration

| - | <u>Oct 98</u> | <u>May 99</u> | <u>Nov 99</u> | <u>May 00</u> |
|-----------|---------------|---------------|---------------|---------------|
| Treatment | -0.007 | -0.010 | -0.016 | -0.051 |
| Control | -0.012 | -0.013 | -0.012 | -0.050 |



Baseline Means for Children < Age 4

| | <u>Treatment</u> | <u>Control</u> | <u>Diff</u> | <u>t-stat</u> |
|-----------------------------|------------------|----------------|-------------|---------------|
| Ill last month (=1) | 0.33 | 0.32 | 0.01 | (0.43) |
| Age | 1.63 | 1.61 | 0.02 | (0.57) |
| Male (=1) | 0.51 | 0.49 | 0.02 | (1.61) |
| Father's Years of Education | 3.80 | 3.84 | -0.04 | (-0.24) |
| Mother's Years of Education | 3.50 | 3.83 | -0.33 | (-2.05) |
| Father Speaks Spanish (=1) | 0.94 | 0.930 | 0.01 | (1.61) |
| Mother Speaks Spanish (=1) | 0.94 | 0.92 | 0.02 | (0.95) |
| Own House (=1) | 0.92 | 0.92 | 0.01 | (0.59) |
| Electricity (=1) | 0.64 | 0.71 | -0.07 | (-1.74) |
| Hectares of Land Owned | 0.81 | 0.79 | 0.02 | (0.32) |
| Male Agricultural Wage | 30.48 | 31.22 | -0.74 | (-0.85) |
| Female Agricultural Wage | 27.26 | 27.84 | -0.59 | (-0.65) |
| Sample Size | 4,519 | 3,306 | | |



Presentation Outline

- *The Intervention*
- *Experimental Design*
- ***Impact on Health after 18 months***
 - **Child morbidity**
 - **Child height**
 - **anemia**
- *Long-Term Impact on health*
- *Lessons*



Child Morbidity Analyses

- *Whether child was ill in last 4 wk.s reported by mom*
 - Maternal reported
 - **Measurement error from reporting bias?**
 - **Orthogonal to treatment effect (Random Assign.)**
 - Hawthorne bias
 - **Change views on what is an illness after program exposure**
 - **So treatments report more illness than controls**
 - **Implies lower bound estimated impact**
- *Random effects logistic regression*
 - Same controls as above



Impact on Probability Report Child is Ill in Last Month (Log Odds)

| Months on PROGRESA | Newborns | Age 0 | Age1 | Age 2-3 |
|-----------------------------|----------|----------|----------|----------|
| 6-9 m Pre + 3-6 m Postnatal | 0.747** | | | |
| 6 months Postnatal | | 1.057 | 0.829* | 0.943 |
| 12 months Postnatal | | 0.768*** | 0.807* | 0.766** |
| 18 months Postnatal | | 0.825* | 0.808* | 0.850* |
| 24 months Postnatal | | 0.710*** | 0.657*** | 0.712*** |

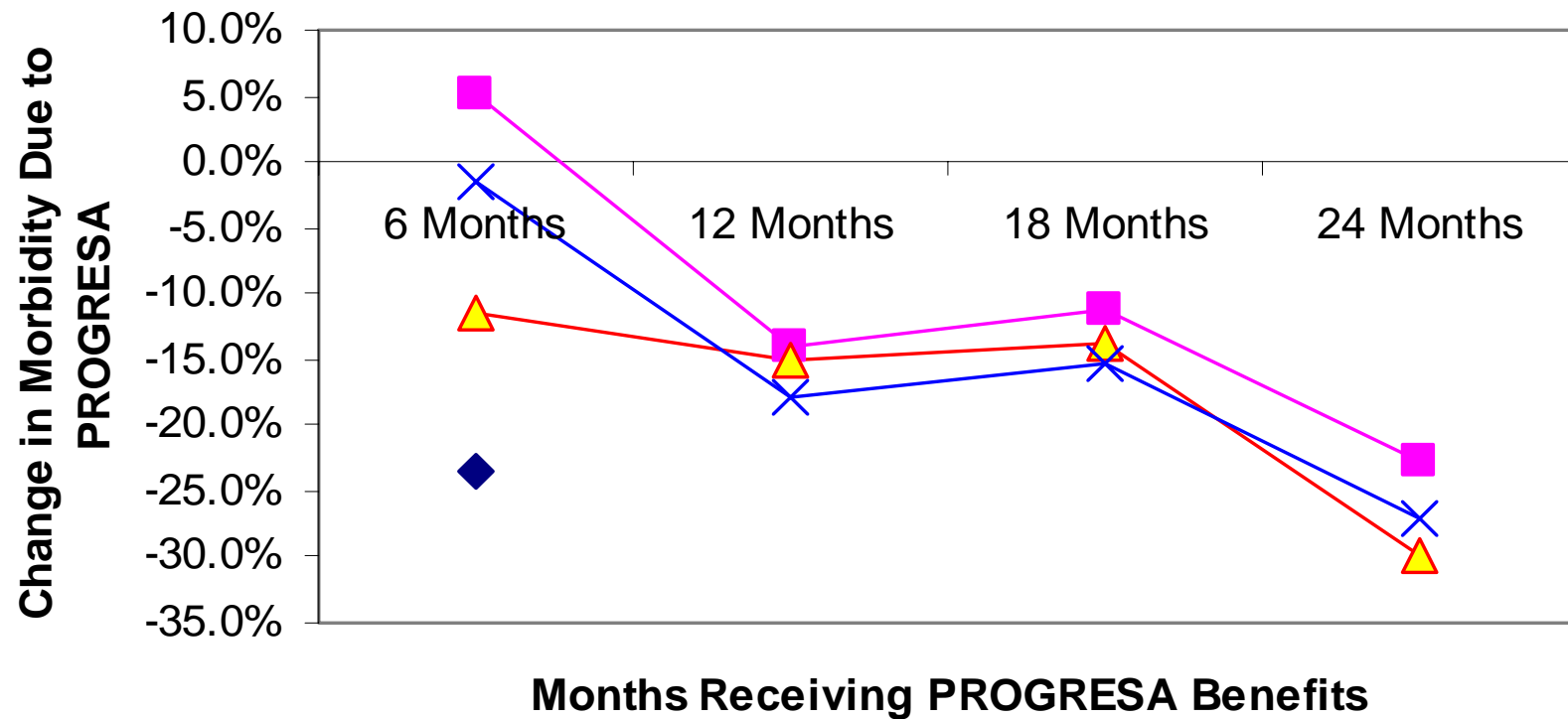
Each row is the treatment effect from a separate random effects logistic regression that also controls for

Demographics: age, sex, education, family structure

Baseline economic status: ownership of land & housing , electricity, male & female village wage rates



Impact on Morbidity is Cumulative



- ◆ Newborn
- ▲ Age 1 at Baseline
- Age 0 at Baseline
- × Age 2-3 at Baseline



Armenia & Height From Nutrition Sub-Sample

- *Half the enumeration areas about 12 months after the intervention*
- *Collected Hemoglobin in sample of kids age 12-48 months old*
- *Collected Anthropometric Measurements on sample of kids 12-36 months*



Anemia Analyses

- *Anemia*
 - Measured by low hemoglobin adjusted for altitude
 - RE logistic regression with same controls
- *Find PROGESA reduced incidence of Anemia by 12.7% after 12-18 months*



Height Model

- *Usually standardize height*
 - relative to a healthy reference population (US)
 - Z-score within narrow age/sex categories
 - Problematic if measurement error in age or if true reference population not US standard
- *Instead*
 - Use Height as dependent variable
 - Include age-sex dummies on right hand side
 - RE regression with same controls



Impact on Height

- *Height is a measure of long term health*
 - Potential height is genetic
 - Realized height is potential reduced by
 - **Insufficient nutrition**
 - **Illness, reduces ability to absorb nutrition**
 - Cumulative effect of illness/nutrition
- *Find PROGRESA increased height by about 1 cm, but no effect on stunting*



Presentation Outline

- *The Intervention*
- *Experimental Design*
- *Impact on Health After 18 months*

- ***Long-term Impact on Child Health***
 - Physical Development
 - Motor Skills
 - Cognitive Development

- ***Lessons***



Resurveyed Rural Cohort in Fall of 2003

- *Interested in medium to long-term effects*
- *Added new matched control group*
- *Interested in return to early childhood investments in poor families*
 - Compare children who received benefits from birth to those who received them starting at age 3.
 - Can children “catchup” or is early investment critical



Program Improved Physical Health & Nutrition

| | <u>Boys</u> | <u>Girls</u> |
|----------------------|-------------------|-------------------|
| Heart Rate | -0.84% | -1.21%*** |
| Height (cm) | 0.98%*** | 1.28%*** |
| Stunted (=1) | -22.22%*** | -35.48%*** |
| Hemoglobin | 1.29% | 2.38%*** |
| Anemic (=1) | -4.17% | -21.74%*** |
| Sick Days Last Month | -40.25%*** | -21.15%*** |



Program Also Improved Motor Development

| | <u>Boys</u> | <u>Girls</u> |
|--------------------------------|-------------|--------------|
| Walking Backwards | 20.39%*** | 11.21%*** |
| Standing on right foot | 9.00%*** | 10.78%*** |
| Walking on Tiptoes | 20.45%*** | 11.46%*** |
| Standing on left foot | 8.16% | 10.78%*** |
| Walking Straight Line | 18.37%*** | 13.86%*** |
| Skipping | 24.71%*** | 5.43%*** |
| Seconds Standing on Right Foot | 8.26%*** | 11.15%*** |
| Seconds Standing on Left Foot | 10.88%*** | 8.61% |



Little Effect on Cognitive Development

| | <u>Boys</u> | <u>Girls</u> |
|---------------------------------------|----------------|--------------|
| Log (Long Term Memory Test) | 0.00% | -.5.04% |
| Log (Short Term Memory Test) | 1.01% | 6.33% |
| Log (Visual Integration Test) | -2.70% | -5.58% |
| Log (Peabody Picture Vocabulary Test) | 10.03%* | 0.00% |
| Communication Dev. Inventory | 6.29% | 6.22% |
| Words & Sentences Test | 16.13%* | 8.82% |



Big Gains in Physical but Not Cognitive Development

- *Brain nutritionally ready but not stimulated in rural environment*
- *Gains in physical development because of exercise*
- *Need to add intervention that stimulates brain e.g. early childhood development*



Child not ready for school & program does not help

Cognitive Development Percentiles

| | <u>Boys</u> | <u>Girls</u> |
|--------------------|-------------|--------------|
| Long-Term Memory | 16.08% | 14.85% |
| Short-Term Memory | 21.54% | 23.12% |
| Visual Integration | 7.15% | 7.12% |
| Vocabulary | 18.86% | 17.68% |



Presentation Outline

- *The Intervention*
- *Experimental Design*
- *Short-Term Impact*
- *Long-term Impact*

- **Lessons**

- **PROGRESA experiment**
- **Limitations**
- **Policy Influence**
- **Future Work**



PROGRESA Experiment a Success

- *PROGRESA*
 - improved child & health
 - Alleviated immediate needs of poverty
 - Improved “capabilities”
 - Need to add ECD
- *Marginal cost over a cash transfer program*
 - Information system to verify compliance
 - Total admin costs 2.3%
 - Information systems .1%



Major Limitation of the Evaluation

- *Unable to evaluate PROGRESA relative to*
 - Pure cash transfer program
 - Pure program supply intervention
 - Therefore, don't really know effects of combined program
- *Possible Identification strategy & Preliminary Results*
 - Families get extra cash transfers if school age kids are enrolled in school
 - Instrument is treatment interaction with sib structure
 - Find no effect of additional cash transfers on child health



Rigorous Evaluation Feasible, Cheap, and Influenced Policy Makers!

- *Random assignment*
 - Equitable when budget constraint prevents immediate national rollout
 - Easy for Policy Makers to understand
 - Hard for political opponents to criticize
- *Fox Government is expanding PROGRESA*
 - New urban *PROGRESA* evaluation
- *Others are adopting PROGRESA-like programs*
 - e.g. Argentina, Brazil, Columbia, Honduras, Jamaica, Nicaragua, Peru, Turkey
 - Article in Today's San Diego Union Tribune

