Effects of Health on Adult Outcomes

Worms at Work: Long-Run Impacts of a Child Health Investment

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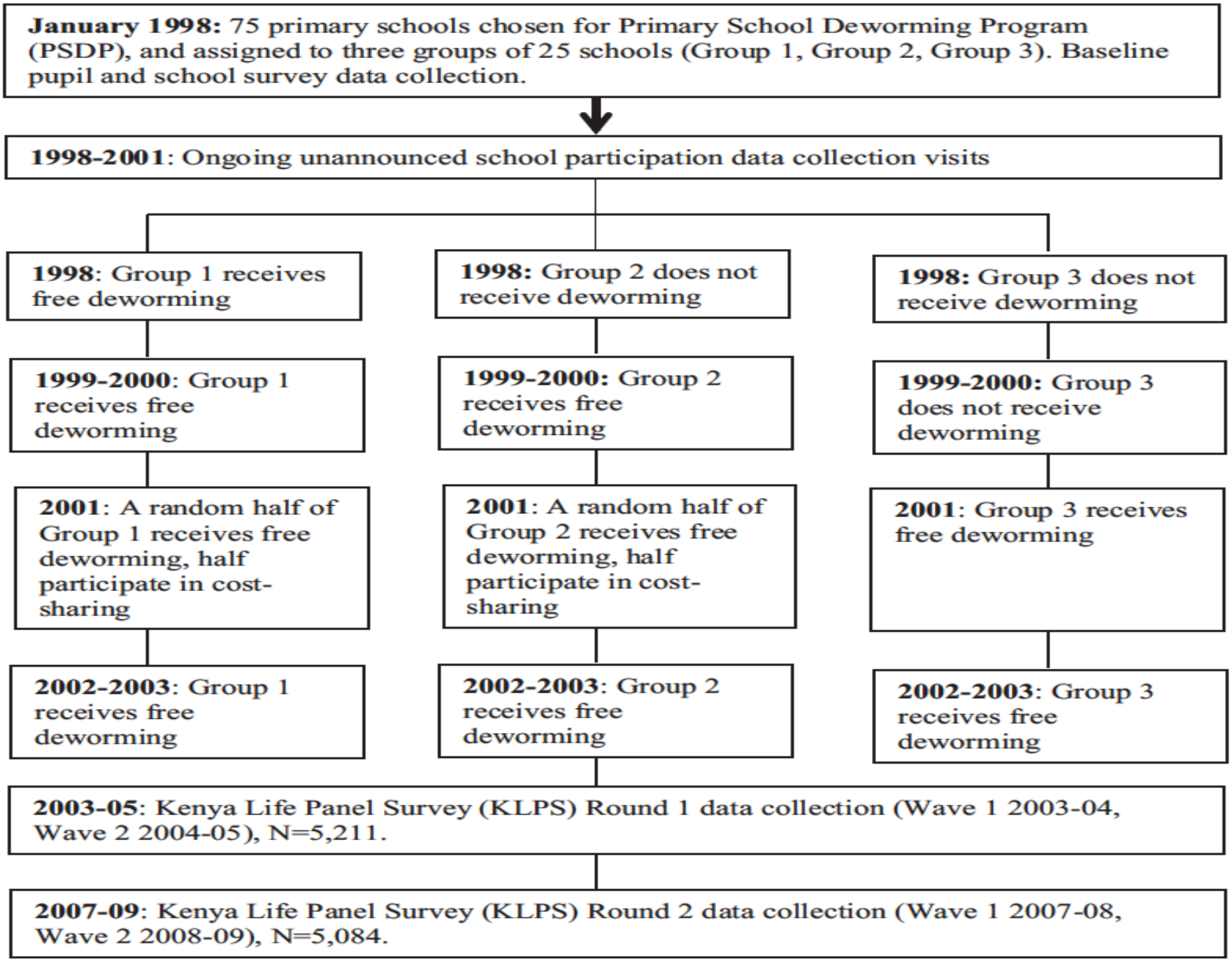
Intro

- Examine how child health gains affect adult outcomes
  - Important for policy because link underlies many school health and nutrition program
- This paper is different as looks at investments in health **in later** childhood
  - Harder to affect height and cognitive development, but could affect congniitive functioning.
  - Effect comes through more time in school or better able to work as healthier
- Introduce theory to discuss channels or mechanisms
  - Grossman (1972): health human capital affect health time in the future
  - Bleakley (2010): how healthy time is allocated depends on how health improvements affect relative productivity in education and labor
  - PRH (2012): how time allocated depends on how the market values increased human capital (returns to education) versus increase raw labor capacity (healthier so can work faster and longer hours - physical strength)
    - May be gender differences


January 1998: 75 primary schools chosen for Primary School Deworming Program (PSDP), and assigned to three groups of 25 schools (Group 1, Group 2, Group 3). Baseline pupil and school survey data collection.
1998-2001: Ongoing unannounced school participation data collection visits
1998: Group 1 receives free deworming
1998: Group 2 does not receive deworming
1998: Group 3 does not receive deworming
1999-2000: Group 1 receives free deworming
1999-2000: Group 2 receives free deworming
1999-2000: Group 3 does not receive deworming
2001: A random half of Group 1 receives free deworming, half participate in cost-sharing
2001: A random half of Group 2 receives free deworming, half participate in cost-sharing
2001: Group 3 receives free deworming
2002-2003: Group 1 receives free deworming
2002-2003: Group 2 receives free deworming
2002-2003: Group 3 receives free deworming
2003-05: Kenya Life Panel Survey (KLPS) Round 1 data collection (Wave 1 2003-04, Wave 2 2004-05), N=5,211.
2007-09: Kenya Life Panel Survey (KLPS) Round 2 data collection (Wave 1 2007-08, Wave 2 2008-09), N=5,084.

Program

- For 75 primary schools in Busia Kenya
- Program phase-in between 1998-2001
  - Group 1 1998
  - Group 2 1999
  - Group 3 2001
- Cost sharing experiment
  - In 2001 randomize half the Group1 and 2 schools to pay
  - Led to 60% reduction in treatment
  - In 2002/2003 free again
- Not clear if [program ended by 2003

Treatment

- Group 1 and 2 (treatment) and Group 3 is the control
- Received 2.41 more years of deworming
- Differential effect, but some in Group 3 didn't receive anything as aged out.

Data

- Data collected for project
- Baseline 1998: Kenya Life Panel Survey – 1
  - ~7,500 respondents enrolled in grades 2-7 in 1998
- 2007-2009: Kenya Life Panel Survey – 2
- Followed migrants throughout Kenya and to Uganda
  - Interviewed everyone until pace of locating respondents slowed down
  - Choose a random sample of who to intensively follow
- Tracking rate is 82.5 (with dead) 83.9 (only alive)
- Median age at baseline in the sample was 12
- Looking 10 years later
  - Median age at baseline in the sample was 12
  - Guessing sample now age 16 - 28

Bounding Treatment Effects When There Are Externalities

- Argue the main treatment effects are a lower bound
  - Show that the across school externalities effects have to be the same sign and the main treatment effect, T.
  - If treatment effects are positive but the across school externalities are negative, then the estimates on T would not be a lower bound
- If the worms treatment only has positive externalities, it is hard to believe the main treatment effect T would ever not be a lower bound.
  - They don't argue why the externality could be negative.
  - Had a sticky referee that wanted them to prove this with a model
  - Need to assume monotonicity in the impact based on the P – local saturation of the program
    - If more people around you affected by the program, that will have a bigger effect on your health than if less people around you affected

Now use P instead of N for local saturation

- Realized that putting in the number of people who are treated is endogenous so now use P
- P=number of kids covered by the program within a certain distance of school * average take-up rate for full sample with full subsidy
  - Now local treatment saturation is driven by experimental design, not individual's choices to take-up which was the program with the Ns
- P=1: treatment school
- P=0: control school, surrounded by only control schools within 6 km
- P>0 & P<1: Control school with treatment school within the 6km radius
- Determine 6 km radius: previous analysis shows that cross-school externalities go up to 6 km.

Estimation Strategy

$$Y_{ij} = \alpha + \lambda_1 T_j + \lambda_2 P_j + X'_{ij,0}\beta + \varepsilon_{ij}$$

- *i* = individual, *j* = school
- Y – outcomes
- T – 1/0 treatment (Group 1 or 2 / Group 3)
  - 2-3 additional years of deworming
  - Absolute or Differential ITT impact?
    - Differential: Early versus late treatment
    - Do ITT because compliance rates are high, TOT hard with spillovers
- P – treatment saturation proportion among neighboring schools within 6 km – based on eligibility not actual take up.
  - % coverage of school pupils within 6 k * average take-up rate of deworming drugs in the entire sample
    - Rescales the estimate to be more meaningful magnitude

Estimation Strategy

$$Y_{ij} = \alpha + \lambda_1 T_j + \lambda_2 P_j + X'_{ij,0}\beta + \varepsilon_{ij}$$

- *i* = individual, *j* = school
- N - Number of primary school pupils within 6 km of school j is in the controls
- X – controls variables include survey month, experimental wave dummies, school geographic and demographic characteristics, gender, grade characteristics, pre-program average school test score (academic quality), 2001 cost-sharing school indicator
- Cluster at the school level.

Estimation Strategy

- What does coefficient on T capture?
  - Captures effect of deworming subsidy between treatment and controls schools
    - This includes the direct of effect of taking the treatment and the within school externalities
  - This is the main coefficient of interest
- What does coefficient on P capture?
  - Cross-school externalities, spillover effects on the person from nearby schools also being treated.
  - Estimated because there is variation in the local density of treatment schools due to the randomization
- Why do they do results separately for men and women?
  - Occupations different by gender, and women have twice as many children as compared to men.

Table 1: Long-Run Impacts on Health

TABLE I

DEWORMING IMPACTS ON HEALTH

	Coefficient estimate (std. err.) on deworming treatment indicator			Coeff. est. (std. err.) externality term	Control group mean (std. dev.); *number of observations*		
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Moderate-heavy worm infections in 2001	−0.166***	−0.191***	−0.144***	−0.074	0.327	0.319	0.337
	(0.026)	(0.028)	(0.032)	(0.223)	(0.469)	(0.466)	(0.473)
					2,297	*1,216*	*1,081*
Self-reported health "very good" indicator at KLPS-2	0.040**	0.023	0.051**	0.128	0.673	0.713	0.629
	(0.018)	(0.025)	(0.025)	(0.115)	(0.469)	(0.452)	(0.483)
					5,070	*2,585*	*2,485*
Height at KLPS-2	−0.152	0.041	−0.367	−2.136	167.3	171.7	162.4
	(0.272)	(0.376)	(0.396)	(1.632)	(7.9)	(6.4)	(6.4)
					5,057	*2,579*	*2,478*
Body mass index at KLPS-2	0.121	−0.131	0.358**	0.138	21.50	21.31	21.71
	(0.104)	(0.112)	(0.167)	(0.539)	(2.36)	(2.10)	(2.62)
					5,048	*2,576*	*2,472*
Miscarriage indicator (obs. at pregnancy level) at KLPS-2 (for females—themselves; for males—their partners)	−0.015*	0.000	−0.028**	−0.078**	0.030	0.015	0.039
	(0.008)	(0.004)	(0.013)	(0.037)	(0.171)	(0.123)	(0.194)
					5,022	*1,622*	*3,238*

Impact on Table 1 - Health

- Not easy to interpret ITT effect
  - not clear in tables or notes what the unit it.
- First 2 and last are binary indicators.
- Height is likely cm and BMI in it normal units
- Two significant effects:
  - Self-Report Health: What is the ITT effect?
    - 4 percentage point higher in the treatment and than the control areas.
    - This is on a base of 67.3% in the control, so is a 4/67.3=6 percent increase
    - Only significant for females
  - 16.6 percentage point lower worm infections amount treated.
- Miscarriages:
  - 2.8 percentage points on a base of 3.9 percent = 70 percent increase

TABLE II

DEWORMING IMPACTS ON EDUCATION

	Coefficient estimate (std. err.) on deworming treatment indicator			Coeff. est. (std. err.) externality term	Control group mean (std. dev.); *number of observations*		
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Total years enrolled in school, 1998–2007	0.294**	0.150	0.354*	1.015	6.69	7.05	6.29
	(0.145)	(0.166)	(0.179)	(0.839)	(2.97)	(2.93)	(2.96)
					5,037	*2,567*	*2,470*
Total years enrolled in primary school, 1998–2007	0.155**	0.238**	0.026	0.784	4.38	4.43	4.32
	(0.075)	(0.102)	(0.098)	(0.485)	(2.48)	(2.42)	(2.55)
					5,038	*2,568*	*2,470*
Repetition of at least one grade (1998–2007) indicator	0.063***	0.072***	0.053*	0.099	0.672	0.669	0.676
	(0.018)	(0.025)	(0.030)	(0.123)	(0.470)	(0.471)	(0.468)
					5,084	*2,595*	*2,489*
Grades of schooling attained by 2007	0.150	−0.030	0.261	0.323	8.72	9.06	8.34
	(0.143)	(0.148)	(0.171)	(0.842)	(2.21)	(2.28)	(2.07)
					5,084	*2,595*	*2,489*
Attended secondary school indicator	0.030	−0.035	0.090**	−0.032	0.421	0.504	0.329
	(0.035)	(0.038)	(0.038)	(0.217)	(0.494)	(0.500)	(0.470)
					5,084	*2,595*	*2,489*
Passed secondary school entrance exam during 1998–2007 indicator	0.050	0.004	0.096**	0.220	0.505	0.590	0.409
	(0.031)	(0.030)	(0.040)	(0.161)	(0.500)	(0.492)	(0.492)
					4,974	*2,541*	*2,433*
Out-of-school (at 2007–2009 survey) indicator	−0.006	0.022	−0.029	0.185	0.75	0.70	0.80
	(0.022)	(0.030)	(0.026)	(0.142)	(0.43)	(0.46)	(0.40)
					5,058	*2,582*	*2,476*

- What is the total years enrolled in primary school telling us?
- What is the story for boys?
  - Increase in primary school but also repetition, no effect on total schooling or exam scores. Boys leave for work?
- What is the story for girls?
  - Increase secondary schooling by 9pp almost a third higher.
  - Did better on exams

TABLE III

DEWORMING IMPACTS ON LABOR HOURS AND OCCUPATIONAL CHOICE

	Coefficient estimate (std. err.) on deworming treatment indicator			Coeff. est. (std. err.) externality term	Control group mean (std. dev.); *number of observations*		
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Panel A: Hours worked							
Hours worked in all sectors in last week, full sample	1.58	3.49**	0.32	10.20	18.4	20.3	16.3
	(1.04)	(1.42)	(1.36)	(7.80)	(23.1)	(24.6)	(21.1)
					5,084	*2,595*	*2,489*
Hours worked in all sectors in last week, older than school age subsample (older than 12 years of age at baseline)	3.29*	3.74*	2.01	18.0	25.4	28.2	21.7
	(1.80)	(2.21)	(2.45)	(11.8)	(26.1)	(27.2)	(24.1)
					2,235	*1,201*	*1,034*
Panel B: Sectoral time allocation (full sample)							
Hours worked in nonagricultural self-employment in last week	1.51***	1.35*	1.86**	6.00*	3.3	3.8	2.7
	(0.55)	(0.73)	(0.81)	(3.23)	(12.8)	(13.7)	(11.7)
					5,084	*2,595*	*2,489*
Hours worked in agriculture in last week	−0.07	1.03*	−1.27**	−0.55	8.3	7.8	8.8
	(0.42)	(0.55)	(0.56)	(3.41)	(11.4)	(11.6)	(11.2)
					5,084	*2,595*	*2,489*
Hours worked in wage earning in last week	0.14	1.11	−0.27	4.74	6.9	8.8	4.8
	(0.84)	(1.32)	(1.08)	(5.07)	(18.5)	(20.0)	(16.5)
					5,084	*2,595*	*2,489*

- Hours worked generally low
- Effect on males?
  - Worked 3.49 more hours in treated than control group. (17%)
  - Increased hours in both sectors Ag and non-Age
- Effect on women? Increased hours in non age by 70% or 1.86hr, reduce ag hours by slightly less, 1.27 hrs (14%)

TABLE III

(CONTINUED)

	Coefficient estimate (std. err.) on deworming treatment indicator			Coeff. est. (std. err.) externality term	Control group mean (std. dev.); *number of observations*		
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Panel C: Occupational choice (full sample)							
Manufacturing job indicator	0.0110***	0.0192**	0.0050	0.0531**	0.0049	0.0068	0.0027
	(0.0040)	(0.0077)	(0.0035)	(0.0250)	(0.0698)	(0.0824)	(0.0522)
					5,084	*2,595*	*2,489*
Construction/casual labor job indicator	−0.0053**	−0.0031	−0.0073	−0.0196	0.0048	0.0040	0.0057
	(0.0026)	(0.0030)	(0.0045)	(0.0154)	(0.0691)	(0.0628)	(0.0756)
					5,084	*2,595*	*2,489*
Domestic service job indicator	−0.0050	0.0016	−0.0134	−0.0097	0.0192	0.0067	0.0331
	(0.0061)	(0.0038)	(0.0129)	(0.0322)	(0.1372)	(0.0813)	(0.1791)
					5,084	*2,595*	*2,489*
Grows cash crop indicator	0.0136**	0.0068	0.0207**	0.0111	0.0073	0.0080	0.0065
	(0.0060)	(0.0071)	(0.0094)	(0.0260)	(0.0850)	(0.0890)	(0.0803)
					5,068	*2,588*	*2,480*

- Little confusing that effect for women don't match up with time use last week.
- Women have not moved to manufacturing; increase in nonag self employment and cash crops so moving into more productive traditional activities.

TABLE IV

DEWORMING IMPACTS ON LIVING STANDARDS AND LABOR EARNINGS

	Coefficient estimate (std. err.) on deworming treatment indicator			Coeff. est. (std. err.) externality term	Control group mean (std. dev.); *number of observations*		
	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Panel A: Consumption and nonagricultural earnings							
Number of meals eaten yesterday, full sample	0.095***	0.125***	0.051	0.415***	2.16	2.10	2.23
	(0.029)	(0.041)	(0.043)	(0.124)	(0.64)	(0.65)	(0.62)
					5,083	*2,595*	*2,488*
Number of meals eaten yesterday, older than school age subsample (older than 12 years of age at baseline)	0.119***	0.147***	0.070	0.406*	2.11	2.04	2.20
	(0.042)	(0.051)	(0.063)	(0.236)	(0.66)	(0.67)	(0.63)
					2,234	*1,201*	*1,033*
Total nonagricultural earnings (wage earnings plus self-employed profits), past month, full sample	112	139	98	226	749	1,115	340
	(96)	(171)	(68)	(694)	(2,132)	(2,703)	(1,075)
					5,084	*2,595*	*2,489*
Total nonagricultural earnings (wage earnings plus self-employed profits), past month, older than school age subsample (older than 12 years of age at baseline)	278	312	188	1,152	1,231	1,774	527
	(167)	(265)	(139)	(971)	(2,440)	(2,903)	(1,375)
					2,235	*1,201*	*1,034*

- Earnings are in local currency – shillings
- No statistically significant effect on earning
  - 15% higher full sample
  - 22.5 % higher restricted sample

TABLE IV

(CONTINUED)

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	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Panel B: Wage earnings (among wage earners)							
Ln(Total labor earnings), past month	0.269***	0.244**	0.165	1.141	7.79	7.92	7.46
	(0.085)	(0.109)	(0.175)	(0.869)	(0.88)	(0.87)	(0.81)
					710	*542*	*168*
Ln(Wage = Total labor earnings / hours), past month, if ≥ 10 hours per week of work	0.197*	0.181	0.225	0.378	2.68	2.88	2.21
	(0.102)	(0.128)	(0.194)	(0.898)	(0.91)	(0.89)	(0.81)
					601	*448*	*153*
Ln(Total labor earnings), most recent month worked since 2007	0.225***	0.221**	0.178*	0.941	7.83	7.97	7.54
	(0.070)	(0.097)	(0.104)	(0.597)	(0.91)	(0.89)	(0.89)
					1,175	*819*	*356*

- Note LHS is in log, so it is dropping anyone who does not make a wage. This creates selection and is problematic.
- They describe impact in log points – this a bit unusual. Usually it would be in percent.

TABLE IV

(CONTINUED)

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	(1) All	(2) Male	(3) Female	(4) All	(5) All	(6) Male	(7) Female
Panel C: Nonagricultural self-employment outcomes (among nonagricultural self-employed)							
Total self-employed profits (self-reported) past month	384	111	250	−77	1,766	2,135	1,265
	(308)	(465)	(265)	(1,646)	(2,619)	(3,235)	(1,261)
					585	*313*	*272*
Total self-employed profits past month, top 5% trimmed	341*	259	80	440	1,221	1,184	1,265
	(177)	(309)	(219)	(1,256)	(1,151)	(1,056)	(1,261)
					553	*284*	*269*
Total employees hired (excluding self)	0.416	0.245	0.603	−0.886	0.188	0.253	0.097
	(0.361)	(0.403)	(1.275)	(2.547)	(0.624)	(0.614)	(0.630)
					633	*343*	*290*

Notes. For details on the regressions, see the notes for Table I. Each entry in columns (1)–(3) is from a separate OLS regression, except for "total employees hired" in Panel C, which uses a negative binomial regression. "Older than school age" denotes those older than 12 years of age (the median age) at baseline in 1998. Real earnings measures account for the higher prices found in the urban areas of Nairobi and Mombasa. We collected price surveys in both rural western Kenya and in urban Nairobi during KLPS-2, and base the urban price deflator on these data; results are unchanged without this price adjustment. The total nonagricultural earnings measure in Panel A includes those with zero reported earnings and profits. The wage, earnings, and profits results in Panels B and C are among those who reported wage employment or nonagricultural self-employment, respectively. When computing wages, we exclude those with fewer than 10 hours a week to address division bias from noise in estimation of number of hours worked. "Total employees hired" is among those who are self-employed. Significant at 90% (*), 95% (**), 99% (***) confidence.

Rate of Return

- More common in development papers than labor papers
- Let you all go through it. Good to look at if you think you need to do one.
  - Usually lots of assumptions
- Helps compare between interventions
- Internal Rate of Return (IRR): 31.8%

No Place Like Home: Long-Run Impacts of Early Child Health and Family Planning on Economic and Migration Outcomes

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Motivation

- Improved early life circumstances believed to associated with better labor market outcomes (Heckman 2006, Knudsen et al. 2006)
  - Important policy question as many government program rely on link
  - Will improvements in early life be sustained?
    - Fade out, competing health risks, other shocks
    - Complementarity: early investment followed up by later investment to be productive (Heckman 2007)

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    - Fade out, competing health risks, other shocks
    - Complementarity: early investment followed up by later investment to be productive (Heckman 2007)
- Work migration important strategy to improve labor market outcomes
  - Effect of improved child circumstances on work migration unknown
    - Unable to study in some long-term studies due to attrition or small sample

This Paper

Examine effect of early investment in children from a Maternal and Child Health and Family Planning (MCH-FP) in Matlab Bangladesh *35 years after program start* on economic outcomes.

- Labor market
- Job location / migration / timing of migration
- Other economic outcomes : consumption, assets, loans

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➢ Examine effects for men and women

➢ Companion paper that examines effects on human capital

Preview of Research Design

- **Strong interventions:** family planning & childhood vaccines
  - Arguable two of the most important health interventions in the latter part of the past century
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- **Single difference intent-to-treat (ITT) effects**
  - Treatment and comparison group built into design
  - Long-term analysis double-differences more difficult

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- **Focus on two cohorts differently affected by interventions**
  - Born during family planning roll out: 1977-1981 (age 30-34)
  - Born during child health roll out: 1982-1988 (age 24-29)

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- Focus on two cohorts differently affected by interventions
  - Born during family planning roll out: 1977-1981 (age 30-34)
  - Born during child health roll out: 1982-1988 (age 24-29)
- **Data: pre-program to 35 years after program start**
  - Demographic surveillance site – pre-program data
  - Survey data ~2012-2015: < 10 percent attrition

Related Literature: Quasi/Experimental Improvements in Early Child Health & Labor Market/Migration

- Influential developing country experimental studies –mix results
  - Guatemala: INCAP study on nutrition (Hoddinott et al. 2008)
    - ~40% attrition if include those who died, ~30% if dead not included
    - Wages of men increased, hours decrease, no effect on earnings
  - Jamaica: Nutrition/stimulation <3 (Gertler et al. 2014)
    - 170 people, attrition rate of 21%.
    - Income: no effect from nutrition alone, 25% increase from stimulation
- Eradication Papers: hookworm & malaria (Bleakley 2007, 2010)
- US Headstart: low income children from birth – age 5
  - Services: early childhood education, health, and nutrition
  - Headstart – not randomized – effect on wages lower end of distribution (Haan and Leuven 2014)

Contributions

- **Longer-run effects of quasi-random intervention designed to *improve* health and nutrition under age 5 – key for policy**
  - Most quasi-random research on negative shocks (Almond et al. 2018)
  - Few well-designed programs twenty+ years old with sufficient data

Contributions

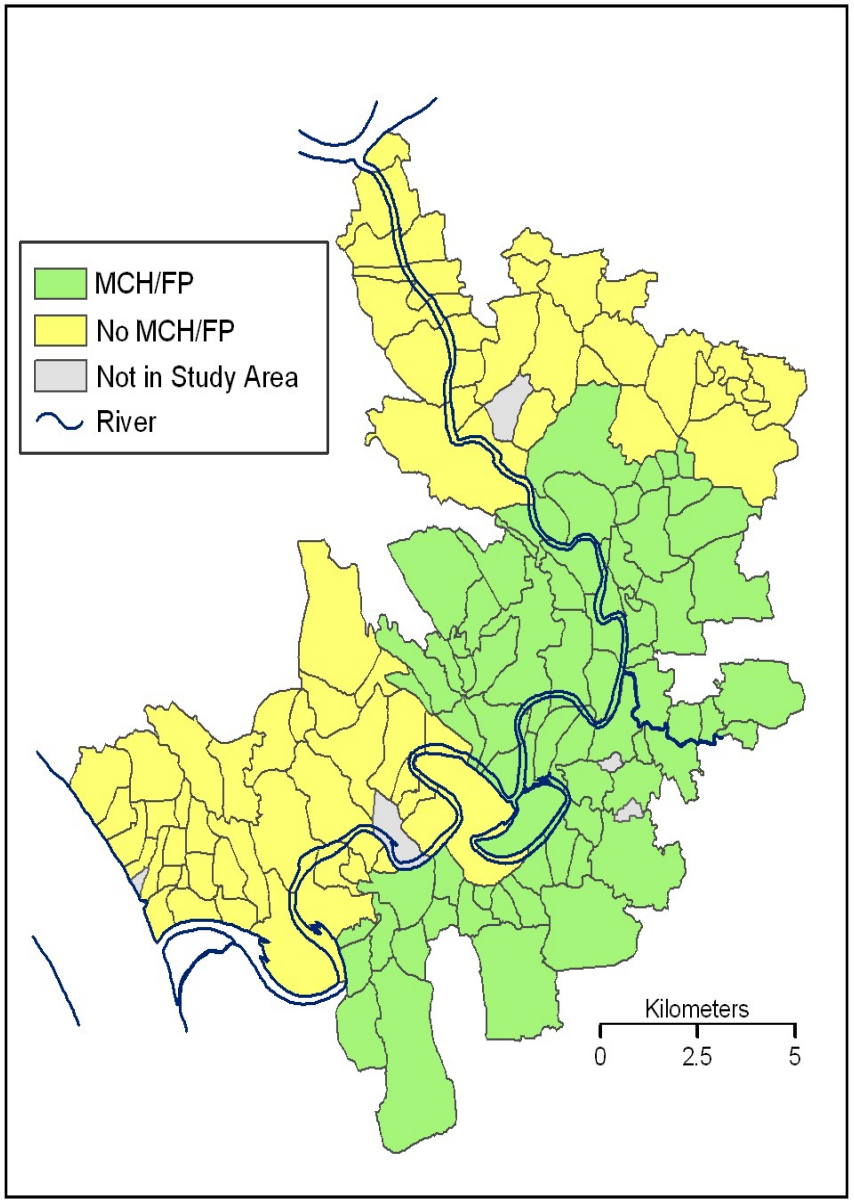
- Longer-run effects of quasi-random intervention designed to *improve* health and nutrition under age 5 – key for policy
  - Most quasi-random research on negative shocks (Almond et al. 2018)
  - Few well-designed programs twenty+ years old with sufficient data
- **Low attrition rates in a highly mobile population (<8%)**
  - >60 percent of men in sample are migrants
  - Reduces attrition bias on earnings
    - Migrants often lost to attrition and their earnings are higher
  - Study work-migration decisions and migration as a mechanism

Contributions

- Longer-run effects of quasi-random intervention designed to *improve* health and nutrition under age 5 – key for policy
  - Most quasi-random research on negative shocks (Almond et al. 2018)
  - Few well-designed programs twenty+ years old with sufficient data
- Low attrition rates in a highly mobile population (<8%)
  - >60 percent of men in sample are migrants
  - Reduces attrition bias on earnings
    - Migrants often lost to attrition and their earnings are higher
  - Study work-migration decisions and migration as a mechanism
- **Rich data – include analysis often missed in long-term studies**
  - Linked pre-program census and demographic surveillance data
    - Baseline & attrition balance
    - Birth to follow-up attrition weights
    - Migrant networks pre- and post- program

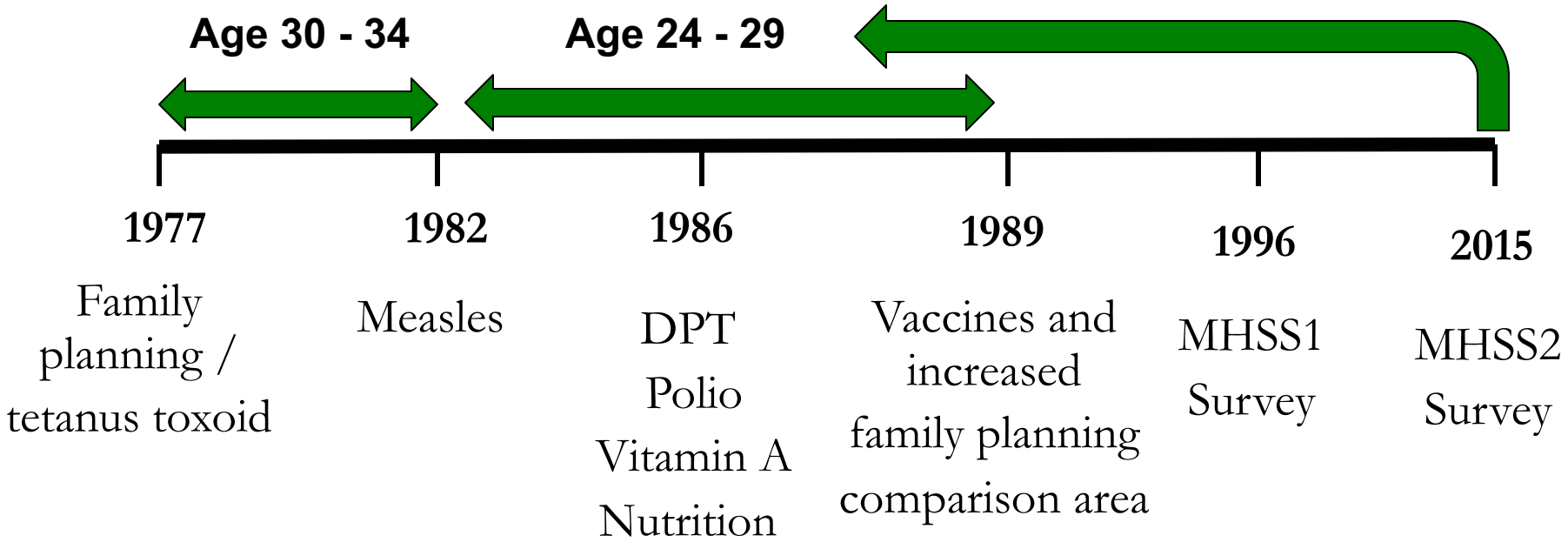
The Matlab Study Area

- Rural area 55 km SE of Dhaka
- ~200,000 people in 142 village
- Mother and Child Health and Family Planning Program (MCH-FP)
  - **Started in Oct. 1977**
  - icddr,b
  - Pilot for government program
- Treatment and comparison areas
  - Built into program design
  - Determined pre-program
  - Contiguous areas
    - Minimize spillovers from vaccinatic
    - Baseline balance good
      - Access tube well water, religion
  - Main town in treatment area



MCH-FP Study Design

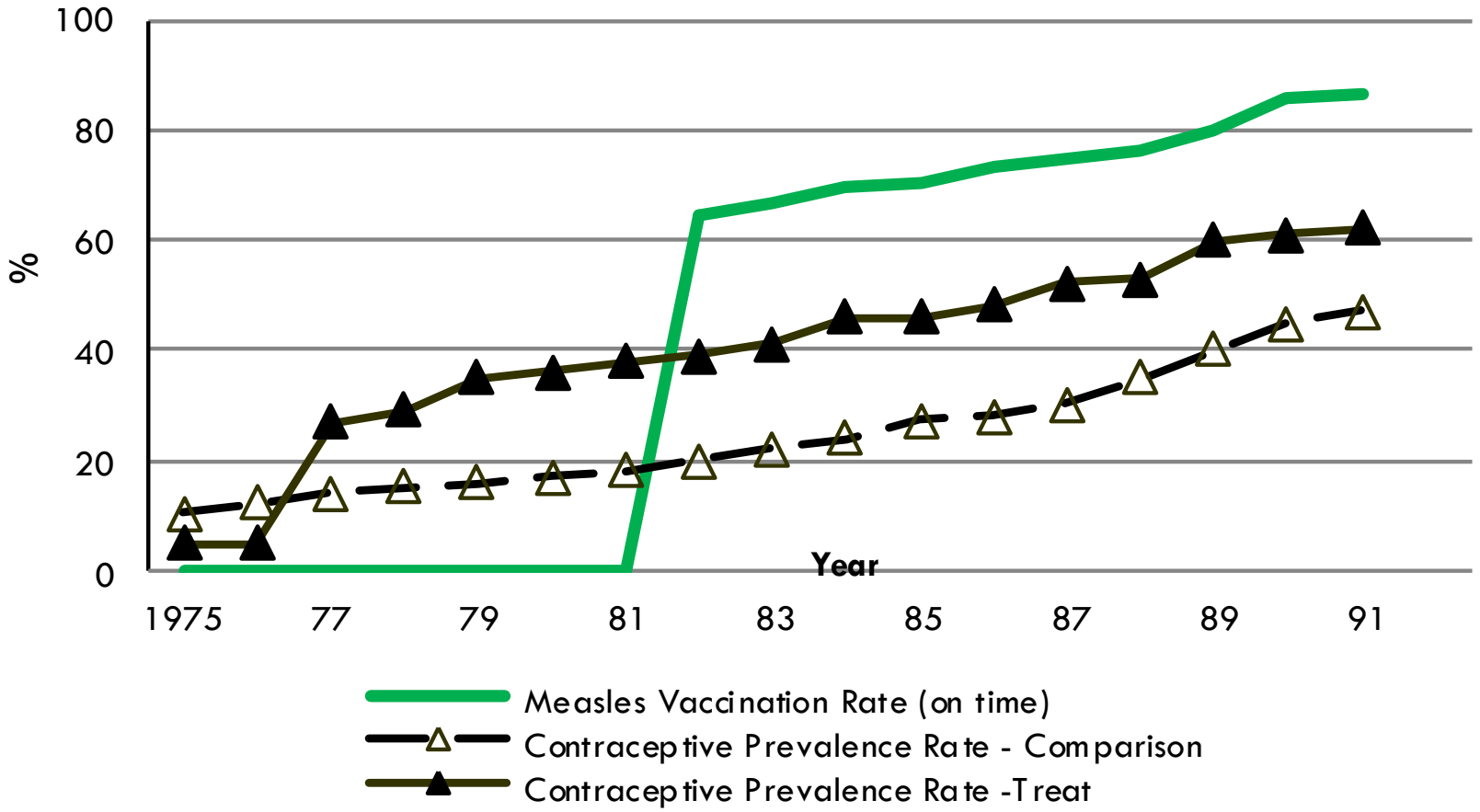
Cohorts of Interest MHSS2



- Interventions provided in home by community health workers
- Matlab Health and Socio-Economic Survey (MHSS) 1996 & 2015
- Key cohort: 1977-1982 & 1982-1988

Program Uptake

Measles vaccination and contraceptive prevalence



Mechanisms During Work Years

Human Capital on Migration

- Highest expected returns (Todaro 69/76; Harris & Todaro 70)
  - Migrate more: if higher returns to human capital
  - Migrate less: uncertainly over expected return to human capital
    - Uncertainty in how to obtain a better jobs and returns outside study area
- Effect on migration duration ambiguous (Dustman 2003, Wahba 2014)
  - Reach target savings earlier
  - Preference for consuming with family and friends, so return earlier

Mechanisms During Work Years

- **Smaller Family Size on Migration**
  - Negative effect:
    - Need to stay to help with family business/farm
      - Less people to migrate for income diversification
    - Need to stay to help care for family
    - Can stay because don't need to migrate to support family
      - e.g. pay for education and migration cost of siblings
  - Positive effect:
    - With less kids have more resources to pay for a child to migrate
    - Diversify income or support parents, less children to migrate so you more likely

Related Papers on MCH-FP Experiment

Short-Term Effects

- Mortality: reduced from measles: (Clemens et al. 1988)
  - Reduction in rate of deaths attributable to measles is 57%
- Migration: 19% reduction between 1982-1988 (Barham & Kuhn 2014)

Medium-Term Effects

- Fertility: one less child (Joshi & Shultz 2007)
- Higher human capital age 8-14, 1982-88 cohort (Barham 2012)
  - 0.2 SD height/education, ~ 0.25 SD cognition

Longer-Term Effects: same sample and data as current paper

- Higher human capital (Barham, Kagy, and Hamadani 2018)
  - Height 0.20 SD
  - Education 0.66 years (for men)
  - Catch-up in cognition

Data

- **MHSS1 1996 -** Large socio-economic survey – think IFLS
  - Representative sample of 8 % of baris in study area in 1993
  - Primary household: choose 1 household randomly
- **MHSS2 2012-2015**
  - MHSS1 primary sample respondents + all descendants + most spouses
  - Pre-MHSS1 migrants: follow people born to MHSS1 primary household but ***migrated out between program start and MHSS1***
  - Extensive tracking of migrants ***<8% attrition***
    - Phone survey used to contact those who did not return to Bangladesh without survey period

Data

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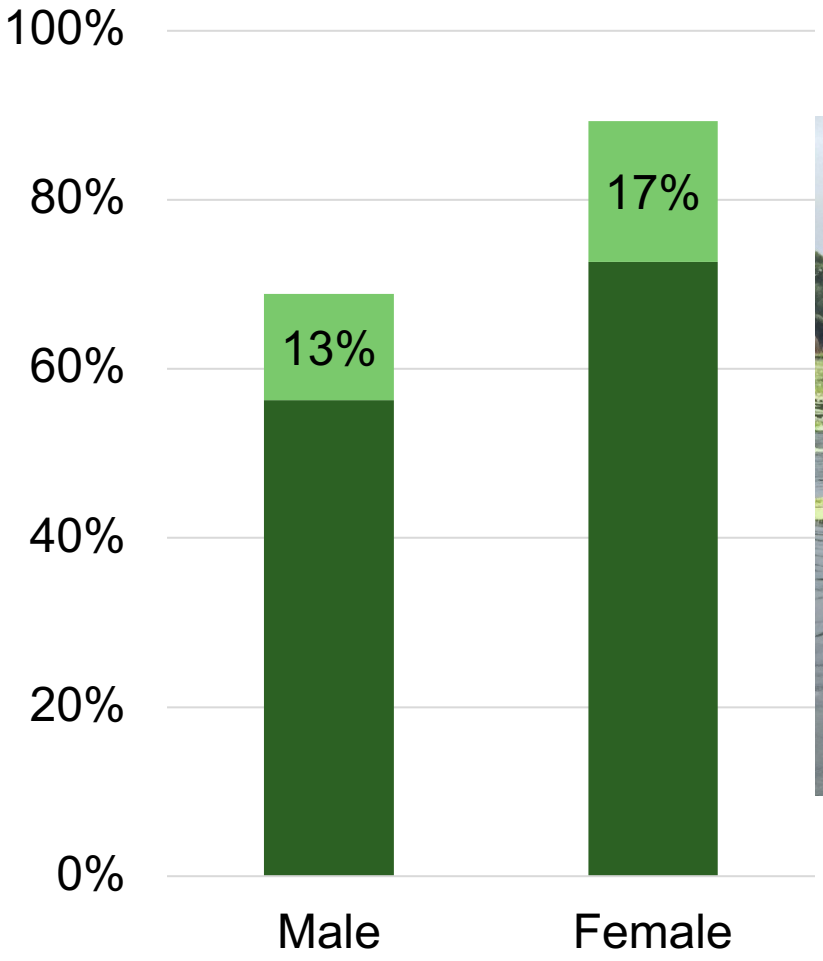
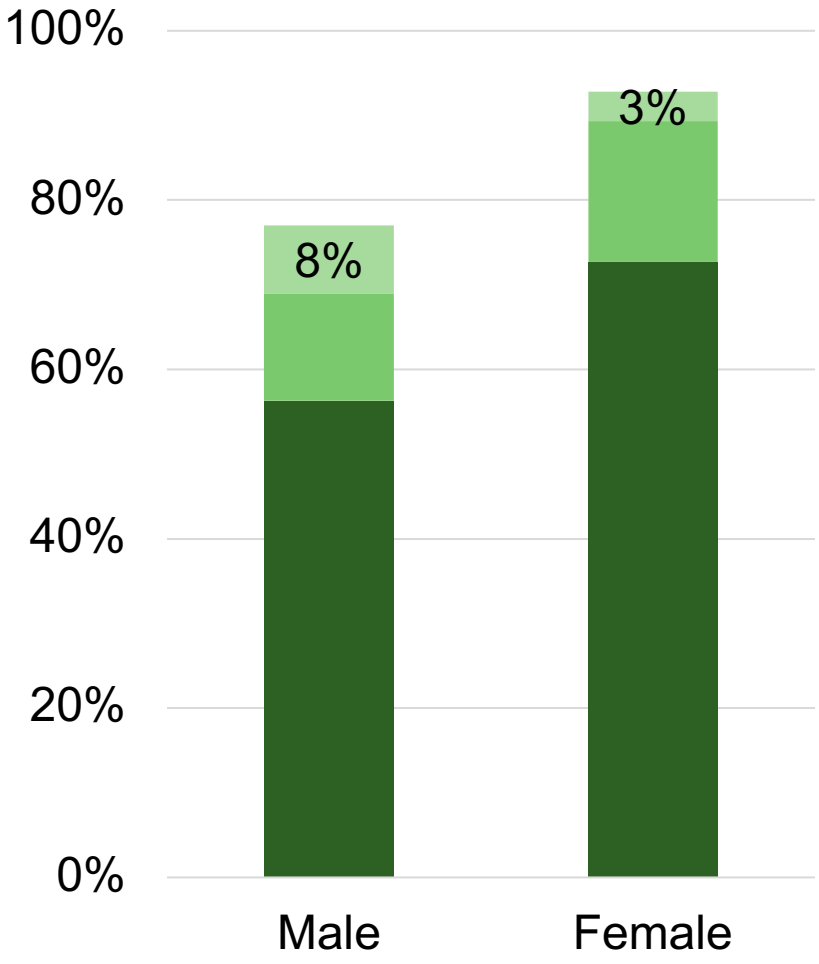
  - Extensive tracking of migrants ***<8% attrition***
    - Phone survey used to contact those who did not return to Bangladesh without survey period
- **Pre-Program Census Data - icddr,b from 1974**
  - IDs to merge all datasets including MHSS1 & 2
- **Demographic Surveillance Site (DSS) Data - icddr,b**
  - Major vital event since 1970s: births, deaths, migration
- **Treatment (1/0):** Trace household head of the first household live in back to 1974

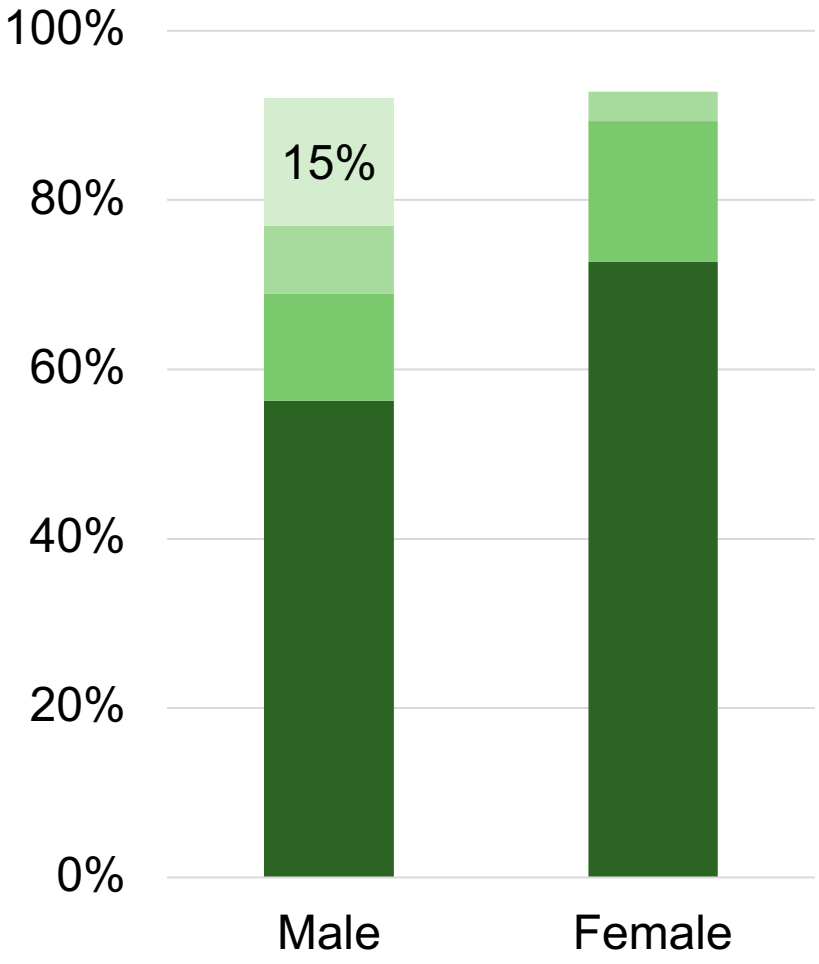
Phase 2: Rapid Response (6 months)
Direct contact to migrant via origin household



Phase 3: Eid Interviews (3 months)
Covering hard-to-track, far away, international



Phase 4: Phone survey (3 months)
Short survey, international migrant males only



- Final coverage for total sample:
- 92% male / 93% female
- Higher for less mobile groups

Similarity by Treatment Status and Attrition

Pre-Intervention Data and Individual Characteristics

	Balance Treat-Comp			Balance Attrit - Surveyed		
	Mean	T-stat	Mean/SD	Mean	T-stat	Mean/SD
Birth year	-0.46	-2.00	-0.05	-2.84	-6.08	-0.31
Muslim (=1)	-0.11	-3.39	-0.18	-0.03	-2.08	-0.03
Bari size	0.76	1.76	0.05	0.37	1.54	0.02
Family size	0.21	1.52	0.04	0.05	0.35	0.01
Owns a lamp (=1) proxy electricity	0.03	1.00	0.03	-0.01	-0.43	-0.01
Owns a watch (=1)	0.00	0.23	0.01	0.01	0.48	0.01
Owns a radio (=1)	0.00	0.05	0.00	-0.03	-2.87	-0.05
Wall tin or tinmix (=1)	0.00	0.01	0.00	-0.01	-0.52	-0.01
Tin roof (=1)	-0.01	-0.27	-0.01	-0.02	-1.35	-0.03
Latrine (=1)	-0.05	-1.57	-0.04	-0.02	-1.41	-0.02
Number of rooms per capita	0.00	0.75	0.02	0.00	-0.81	-0.02
Number of cows	0.11	1.26	0.04	-0.16	-1.94	-0.05
Number of boats	-0.03	-0.67	-0.02	-0.05	-1.74	-0.03
Drinking water, tubewell (=1)	0.15	4.00	0.12	0.00	-0.03	0.00
Dinking water, tank (=1)	0.06	1.10	0.03	0.00	-0.17	0.00
HH age	1.63	2.67	0.07	-0.70	-1.05	-0.03
HH years of education	0.14	0.99	0.03	0.22	1.61	0.04

Empirical Model
Single Difference Intent-to-Treat Effects

$$C_{iv} = \beta_1 AG_{iv}^{24-29} + \beta_2 (T_v * AG_{iv}^{24-29}) + \beta_3 AG_{iv}^{30-34} + \beta_4 (T_v * AG_{iv}^{30-34}) + \alpha_{by} + X'Z + \varepsilon_{iv},$$

Y_{iv} = Outcome of individual *i* from village *v*

T = Treatment eligibility based on 1974 village location

AG = Age group, based on birth year/month

α_{by} = Birth year fixed-effects

X = Religion, Pre-intervention controls interacted with age group

Standard errors: clustered at the village level

Inverse propensity weights for attrition: birth to MHSS2

Extended controls for changes over time: Micro credit, flood control, education supply, arsenic, health supply

MEN – ITT RESULTS

Labor Market Participation: Primary and Secondary Jobs

	Any Paid Work (=1)	Has Second Job (=1)
T*Age 24–29	-0.00	0.04
	(0.02)	(0.03)
T*Age 30–34	-0.03	0.08
	(0.02)	(0.04)+
Percent Change		
T*Age 24–29	0%	31%
T*Age 30–34	-3%	49%
Mean 24–29	0.90	0.13
Mean 30–34	0.96	0.16
N	1,299	1,299

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

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Labor Market Participation: Primary and Secondary Jobs

	Any Paid Work (=1)	Has Second Job (=1)	Type of Work (=1)		
			Prof. & Semi-Prof.	Agric.	Manual
T*Age 24–29	-0.00	0.04	0.09	0.02	-0.06
	(0.02)	(0.03)	(0.04)*	(0.02)	(0.04)
T*Age 30–34	-0.03	0.08	0.02	0.09	-0.04
	(0.02)	(0.04)+	(0.05)	(0.04)*	(0.05)
Percent Changes					
T*Age 24–29	0%	31%	27%	18%	-11%
T*Age 30–34	-3%	49%	5%	71%	-7%
Mean 24–29	0.90	0.13	0.33	0.11	0.57
Mean 30–34	0.96	0.16	0.39	0.13	0.58
N	1,299	1,299	1,299	1,299	1,299

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Labor Market Participation: Primary and Secondary Jobs

	Any Paid Work (=1)	Has Second Job (=1)	Occupation (=1)			Type of Employment (=1)		
			Prof. & Semi-Prof.	Agric.	Manual	Salary	Self-Employ	Family Farm or Biz
T*Age 24–29	-0.00	0.04	0.09	0.02	-0.06	-0.06	0.08	0.03
	(0.02)	(0.03)	(0.04)*	(0.02)	(0.04)	(0.04)+	(0.04)*	(0.02)
T*Age 30–34	-0.03	0.08	0.02	0.09	-0.04	-0.09	0.04	0.08
	(0.02)	(0.04)+	(0.05)	(0.04)*	(0.05)	(0.05)	(0.05)	(0.04)+
Percent Changes								
T*Age 24–29	0%	31%	27%	18%	-11%	-11%	35%	25%
T*Age 30–34	-3%	49%	5%	71%	-7%	-16%	13%	56%
Mean 24–29	0.90	0.13	0.33	0.11	0.57	0.55	0.23	0.12
Mean 30–34	0.96	0.16	0.39	0.13	0.58	0.55	0.30	0.14
N	1,299	1,299	1,299	1,299	1,299	1,299	1,299	1,299

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

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	Any Paid Work (=1)	Has Second Job (=1)	Occupation (=1)			Type of Employment (=1)		
			Prof. & Semi-Prof.	Agric.	Manual	Salary	Self-Employ	Family Farm or Biz
T*Age 24–29	-0.00	0.04	0.09	0.02	-0.06	-0.06	0.08	0.03
	(0.02)	(0.03)	(0.04)*	(0.02)	(0.04)	(0.04)+	(0.04)*	(0.02)
T*Age 30–34	-0.03	0.08	0.02	0.09	-0.04	-0.09	0.04	0.08
	(0.02)	(0.04)+	(0.05)	(0.04)*	(0.05)	(0.05)	(0.05)	(0.04)+
Percent Changes								
T*Age 24–29	0%	31%	27%	18%	-11%	-11%	35%	25%
T*Age 30–34	-3%	49%	5%	71%	-7%	-16%	13%	56%
Mean 24–29	0.90	0.13	0.33	0.11	0.57	0.55	0.23	0.12
Mean 30–34	0.96	0.16	0.39	0.13	0.58	0.55	0.30	0.14
N	1,299	1,299	1,299	1,299	1,299	1,299	1,299	1,299

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Labor Market Participation 2:
Primary and Secondary Jobs

	Prof/Semi-Prof.		Start own
	Salaried	Self-Employ	Business (=1)
T*Age 24–29	0.05	0.06	0.09
	(0.03)+	(0.03)*	(0.04)**
T*Age 30–34	-0.01	0.03	0.03
	(0.04)	(0.04)	(0.04)
Percent Changes			
Age 24–29	29%	44%	46%
Age 30–34	-6%	16%	10%
Mean 24–29	0.17	0.14	0.19
Mean 30–34	0.18	0.19	0.29
N	1,299	1,299	1,299

- *Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Labor Market Participation 2:
Primary and Secondary Jobs

	Prof/Semi-Prof.		Start own Business (=1)	Required Skills	
	Salaried	Self-Employ		Reading, Writing, Math	Physical
T*Age 24–29	0.05 (0.03)+	0.06 (0.03)*	0.09 (0.04)**	0.08 (0.04)*	-0.04 (0.03)
T*Age 30–34	-0.01 (0.04)	0.03 (0.04)	0.03 (0.04)	-0.04 (0.05)	0.02 (0.03)
Percent Changes					
Age 24–29	29%	44%	46%	31%	-5%
Age 30–34	-6%	16%	10%	-13%	2%
Mean 24–29	0.17	0.14	0.19	0.26	0.85
Mean 30–34	0.18	0.19	0.29	0.30	0.85
N	1,299	1,299	1,299	1,299	1,299

- *Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Earnings and Job Location

	Annual Earning (USD) Trim 5%	Annual Hours Worked
T*Age 24-29	-43.17	-24.23
	(110.13)	(92.81)
T*Age 30-34	-497.09	-55.36
	(154.65)**	(114.31)
Percent Change		
Age 24-29	-3%	-1%
Age 30-34	-24%	-2%
Mean 24-29	1,644	3,016
Mean 30-34	2,076	3,230
N	1,180	1,287

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Earnings and Job Location

	Annual Earning (USD) Trim 5%	Annual Hours Worked	Primary Job Location			
			Outside Matlab	Int'l	Urban	Rural
T*Age 24-29	-43.17	-24.23	-0.12	-0.02	-0.09	-0.01
	(110.13)	(92.81)	(0.04)**	(0.03)	(0.04)*	(0.02)
T*Age 30-34	-497.09	-55.36	-0.11	-0.12	-0.01	0.02
	(154.65)**	(114.31)	(0.05)*	(0.04)**	(0.05)	(0.02)
Percent Change						
Age 24-29	-3%	-1%	-17%	-8%	-24%	-24%
Age 30-34	-24%	-2%	-16%	-41%	-3%	85%
Mean 24-29	1,644	3,016	0.69	0.26	0.38	0.04
Mean 30-34	2,076	3,230	0.67	0.29	0.35	0.02
N	1,180	1,287	1,299	1,299	1,299	1,299

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Other Economic Outcomes: Consumption, Household Assets, Loan

- **Household Consumption** (own and sending household)
  - No statistically significant differences
    - Effect size close to zero for sending household for all cohorts
- **Assets** (sending household)
  - ITT Effect: lower value of assets
  - Driven by household assets and live stock values
    - Fewer televisions (19%) and lamps (7%)
    - Fewer cows (more ducks)
  - No differences in productive assets
- **Land**: No differences
- **Loans**: Age 24-29 has *more business loans* (7pp - 102%)
  - Consistent with being more entrepreneurial
- **Savings**: No information

ROBUSTNESS
LABOR MARKET AND MIGRATION
MEN

Robustness: Local Labor Market

	Type Work: Prof/Semi-Prof (=1)			Job Location Outside Matlab (=1)		
	Baseline	**Exclude Town**	**Vill. < 3km Border**	**Baseline**	**Exclude Town**	**Vill. < 3km Border**
T*(Age 24-29)	0.09	0.08	0.11	-0.12	-0.13	-0.09
	(0.04)*	(0.04)*	(0.04)*	(0.04)**	(0.04)**	(0.04)*
T*(Age 30-34)	0.02	0.02	0.01	-0.11	-0.14	-0.11
	-0.05	-0.05	-0.06	(0.05)*	(0.05)**	(0.06)+
N	1,299	1,047	886	1,299	1,047	886

- *Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Robustness Checks

- **Local Labor Markets**
  - Results not driven by main town and similar when only comparing villages near treatment border
  - Food prices similar across study site
- **Intergenerational:** No labor market effects on fathers in 1996
- **Geography** not driving migration
  - Results similar if use either one of the 2 comparison blocks
- **Potential Confounders:** results similar when controlling for BRAC, flood control, schools, health facilities, arsenic
- **Attrition:** results weighted for attrition, similar to unweights. Manski bounds on good jobs bounded away from zero.
- **Spillovers:** none in control villages near treatment border
- **Spatially Correlated Errors:** village level errors are not correlated
- **Multiple Hypothesis Testing:** results remain significant at 10% level or lower adjusting for p-values for all variables following Anderson (2012)
- Random Inference

MECHANISMS

Mechanisms 1

- Complicated for long-run analysis – many potential mechanisms at different points in life

➢ ITT effects on 9 potential direct mechanisms (mech. on LHS)

- Program effects on most mechanisms: hard to know which affect labor market and migration outcomes.
- *Family Planning:* number of younger/older siblings, mother's age
  - ➢ Less siblings, no statistically significant mother's age
- *Human Capital:* height, education (Barham, Kagy, and Hamadani 2018)
  - ➢ Taller and more educated
- *Migration of network:* migrants in bari network, father migrated
  - ➢ Smaller migrant networks, and father's less likely to migrate

TABLE 6—ITT EFFECTS ON POTENTIAL MECHANISMS, MEN

	Number of Younger Male Siblings	Number of Older Male Siblings	Mother Birth Year	Father Migrated Since 1974 (=1)	No. of Migrants in Bari Network (z-score)
	(1)	(2)	(3)	(4)	(5)
Panel A: Single Differences					
Treat*(Age 24–30)	-0.14	-0.33	0.24	-0.06	-0.12
	(0.08)+	(0.13)*	(0.53)	(0.04)+	(0.04)**
Treat*(Age 31–34)	-0.40	0.04	-0.44	-0.06	-0.19
	(0.12)**	(0.14)	(0.64)	(0.05)	(0.04)**
Panel B: Percent Changes					
Treat*(Age 24–30)	-16%	-20%	-	-15%	-
Treat*(Age 31–34)	-31%	3%	-	-16%	-
Age 24–30 Means	0.90	1.65	1,958	0.41	-
Age 31–34 Means	1.31	1.28	1,954	0.36	-
Observations	1,278	1,278	1,293	1,273	1,299

Notes: Standard errors are clustered at the pre-program village level. Means by age cohort are for the comparison group. Regressions include individual characteristics and preintervention characteristics interacted with birth cohort and are weighted to correct for attrition between birth and the MHSS2 survey. Individual characteristics include year of birth fixed effects, age cohort fixed effects, and controls for religion. Preintervention characteristics include all individual and household characteristics in Table 1.

** $p<0.01$, * $p<0.05$, + $p<0.1$

Mechanisms 2

- ITT effect controlling for mechanisms (mech. on RHS)
  - Mechanisms endogenous so …..
  - Not one mechanism explains all the effects
  - Earnings: migration main mechanism
  - Professional Jobs: education explains 25% of effect
  - Migration: mechanisms poor job at explaining program effects

TABLE A5—ITT EFFECTS CONTROLLING FOR MECHANISMS, MEN

	Base Model	Endogenous Control Variables for Regressions on Outcome in Each Panel						
		Job Location Outside Matlab (=1)	Grades Completed/ Enrollment	Height	No. Younger/Older Male Siblings	Mother Birth Year	No. Migrants in Network	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Earnings Past 12 Months (USD) 5 % Trim								
Treat*(Age 24-30)	-13.19	102.22	-27.82	-31.22	-56.17	-16.98	-21.97	48.58
	(108.68)	(85.74)	(107.61)	(108.13)	(103.61)	(107.62)	(109.79)	(84.47)
Treat*(Age 31-34)	-464.32	-259.60	-401.39	-426.46	-471.77	-462.93	-515.07	-244.66
	(153.57)**	(123.04)*	(145.92)**	(150.15)**	(158.73)**	(154.14)**	(157.75)**	(128.64)+
Observations	1,141	1,141	1,141	1,141	1,141	1,141	1,141	1,141
Panel B: Type of Job Professional or Semi Professional (=1)								
Treat*(Age 24-30)	0.09	0.10	0.07	0.09	0.07	0.09	0.09	0.07
	(0.04)*	(0.04)**	(0.04)+	(0.04)*	(0.04)*	(0.04)*	(0.04)*	(0.03)+
Treat*(Age 31-34)	-0.01	-0.01	0.01	-0.01	-0.02	-0.01	-0.00	0.01
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Observations	1,243	1,243	1,243	1,243	1,243	1,243	1,243	1,243
Panel C: Job Location Out of Matlab to any destination (=1)								
Treat*(Age 24-30)	0.11		0.12	0.12	0.12	0.11	0.11	0.13
	(0.04)**		(0.04)**	(0.04)**	(0.04)**	(0.04)**	(0.04)**	(0.04)**
Treat*(Age 31-34)	0.11		0.09	0.10	0.11	0.11	0.12	0.07
	(0.05)*		(0.05)+	(0.05)*	(0.05)*	(0.05)*	(0.05)*	(0.05)
Observations	1,243		1,243	1,243	1,243	1,243	1,243	1,243
Panel D: Job Location Out of Matlab to International Destination (=1)								
Treat*(Age 24-30)	-0.01		-0.01	-0.02	-0.01	-0.01	-0.01	-0.01
	(0.03)		(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.04)
Treat*(Age 31-34)	-0.08		-0.07	-0.07	-0.07	-0.08	-0.09	-0.05
	(0.04)+		(0.04)	(0.04)+	(0.04)	(0.04)+	(0.04)*	(0.04)
Observations	1,243		1,243	1,243	1,243	1,243	1,243	1,243

Notes: Each column for each panel is a separate regression of the outcomes variables in the panel title on the endogenous variable(s) in the column headings. Column (1) restricts the sample to observations with non-missing values for all mechanisms. Column (2) includes three migration variables: migration out of Matlab, migration to an international destination, and migration duration. Column (8) includes all endogenous variables from columns (2)–(7). Standard errors are clustered at the pre-program village level. Regressions have some controls and weights as main results.

** p<0.01, * p<0.05, + p<0.1

Mechanisms 3
ITT Effects by Number of Siblings
Born After 1981: 30-34 cohort only

- Would really like to understand negative effect on 30-34
  - More likely to have a secondary job working on family farm.
  - Migrate less internationally
- Migration and household decision:
  - Perhaps more likely to stay home due healthier younger siblings chosen to migrate

ITT Effects by Number of Siblings Born After 1981: 30-34 cohort only

	Earnings Past 12 Months (USD)	Current Migration	
		Int'l	Urban
T*(Age 30–34)	-409.13 (175.36)*	-0.08 (0.05)	-0.03 (0.06)
T*(Age 30–34)*2 plus sibs born after 81 (=1)	-370.11 (384.40)	-0.12 (0.10)	0.06 (0.12)
N	411	453	453

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

WOMEN

Marriage, Fertility - Women

	Ever Married	Age At Marriage	No. of Children	Age First Child
T*Age 24-29	0.00	-0.48	-0.04	-0.10
	(0.02)	(0.27)+	(0.07)	(0.25)
T*Age 30-34	0.00	0.01	0.19	-0.31
	(0.01)	(0.38)	(0.11)	(0.38)
Percent Change				
Age 24-29	0.00	-0.02	-0.03	0.00
Age 30-34	0.00	0.00	0.08	-0.01
Mean 24-29	0.94	20.08	1.55	21.58
Mean 30-34	1.00	19.92	2.29	22.08
N	3,388	3,088	3,316	3,127

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Participation in Paid Work by Type

	Any Paid Work (=1)	Type of Work (=1)				Ag Type (=1)	
		Prof/ Semi-Prof	Ag	Manual	House Wife	Crops	Animals
T*Age 24-29	0.07	0.01	0.06	-0.01	-0.06	-0.00	0.06
	(0.03)*	(0.01)	(0.02)**	(0.03)	(0.03)+	(0.00)	(0.02)**
T*Age 30-34	0.06	-0.01	0.03	0.04	-0.05	0.00	0.03
	(0.05)	(0.02)	(0.04)	(0.04)	(0.05)	(0.00)	(0.04)
Percent Change							
Age 24-29	27%	24%	43%	-6%	-9%	0.00	43%
Age 30-34	22%	-28%	16%	29%	-8%	0.00	16%
Mean 24-29	0.26	0.04	0.14	0.16	0.65	0.00	0.14
Mean 30-34	0.28	0.04	0.19	0.14	0.64	0.00	0.19
N	1,220	1,220	1,220	1,220	1,220	1,220	1,220

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Participation in Paid Work by Type

	Any Paid Work (=1)	Type of Work (=1)				Ag Type (=1)	
		Prof/ Semi-Prof	Ag	Manual	House Wife	Crops	Animals
T*Age 24-29	0.07	0.01	0.06	-0.01	-0.06	-0.00	0.06
	(0.03)*	(0.01)	(0.02)**	(0.03)	(0.03)+	(0.00)	(0.02)**
T*Age 30-34	0.06	-0.01	0.03	0.04	-0.05	0.00	0.03
	(0.05)	(0.02)	(0.04)	(0.04)	(0.05)	(0.00)	(0.04)
Percent Change							
Age 24-29	27%	24%	43%	-6%	-9%	0.00	43%
Age 30-34	22%	-28%	16%	29%	-8%	0.00	16%
Mean 24-29	0.26	0.04	0.14	0.16	0.65	0.00	0.14
Mean 30-34	0.28	0.04	0.19	0.14	0.64	0.00	0.19
N	1,220	1,220	1,220	1,220	1,220	1,220	1,220

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Income and Hours Work - Women

	Annual Earnings (USD) Trim 5 %		Annual Hours	Primary Job Location			
	Full Sample	Condinonal On Work	Worked	Outside Matlab	Int'l	Urban	Rural
T*Age 24-29	49.61	9.19	95.22	-0.04	0.00	-0.02	-0.02
	(41.52)	(41.30)	(70.57)	(0.04)	(0.00)	(0.04)	(0.02)
T*Age 30-34	-135.16	-44.79	-38.62	-0.11	0.00	-0.10	-0.01
	(119.94)	(39.62)	(112.17)	(0.05)+	(0.01)	(0.04)*	(0.03)
Percent Change							
Age 24-29	38%	6%	23%	-10%	0%	-7%	-21%
Age 30-34	-75%	-38%	-8%	-28%	0%	-33%	-11%
Mean 24-29	131	161	410	0.39	0.00	0.30	0.10
Mean 30-34	181	119	457	0.40	0.00	0.30	0.09
N	1,216	253	1,216	1,220	1,220	1,220	1,220

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Women's Own Resources
Assets, Savings, Loans

	Owns a Productive Asset (=1)	Any Cash Savings (=1)	Ever Had Microcredit Loan (=1)
T*Age 24-29	0.02	0.08	0.06
	(0.03)	(0.03)*	(0.03)+
T*Age 30-34	0.00	0.03	0.04
	(0.04)	(0.05)	(0.05)
Percent Change			
Age 24-29	15%	38%	28%
Age 30-34	0%	13%	13%
Mean 24-29	0.14	0.21	0.21
Mean 30-34	0.18	0.24	0.30
N	1,214	1,209	1,214

•*Notes:* ** <1%, * <5*, + <10%, standard errors clustered at the pre-program village level. Regressions weighted for attrition. Means for the comparison group.

Discussion / Conclusions

Potential benefits of early child health and family planning interventions on **labor market outcomes**

- Men 24-29 Cohort
  - Built human capital, "better" jobs, more entrepreneurial,
  - Lack of effects on earnings temporary as early in career?
    - Trade off with accumulating human capital now for better wages later
    - Will comparison group save more, and have productive investments that will make them better off in the future?
- Women 24-29 Cohort
  - Increased income generating activities in the household (small animals)
  - Not able to move them into work outside the home
    - Perhaps because no differential effect on education due to women's education scholarship program
    - Not enough work opportunities for women outside the home in the local area

Discussion / Conclusions

Early child health and family planning program may reduce **migration**

- Men 24-29 Cohort:
  - Reduced migration to urban areas and no impact on earnings or consumption
  - Welfare higher due to reduce migration costs
- ➢ Men 30-34 Cohort:
  - Reduced international work migration and earn substantially less
  - International migration costs are large, may/not outweigh lost earnings
  - Mechanisms unclear: smaller family sizes and someone has to stay home, or send younger sibs with better human capital, or ??.
- ➢ Migration important mechanism for earnings
  - Important to reduce migration attrition for studies examining labor market outcomes