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# Women's status, *education*, and access to health care: evidence from 20 years of change in Matlab, Bangladesh

Elisabeth Dowling Root

*Associate Professor*

*Department of Geography & Division of Epidemiology*

**The Ohio State University**

*The Michael M. Davis Lecture*

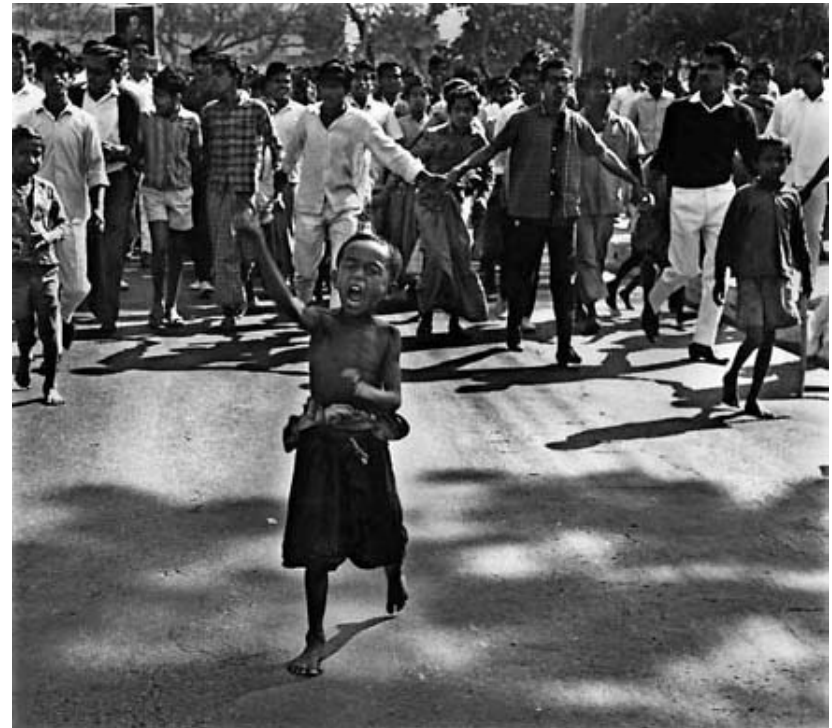
*Center for Health Administration Studies*

*University of Chicago*

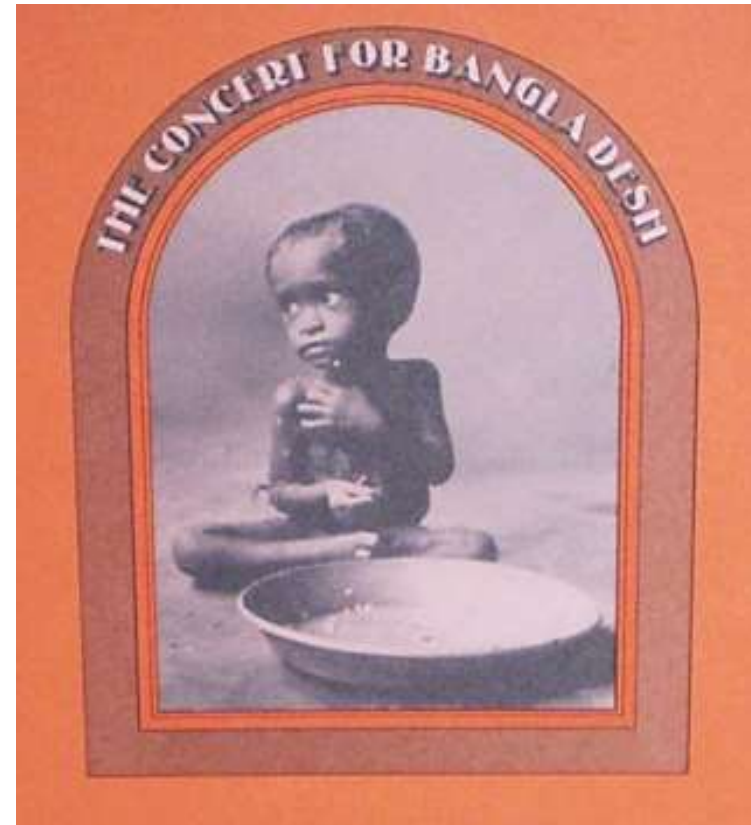
*October 3, 2017*



# The Bangladesh “muktijoddha”



# Bangladesh the “Basketcase”



# The Bangladesh “miracle”

	1970	~2011
Infant Mortality Rate	144	18
Total Fertility Rate	6.3	2.2
Measles Immunization	1%	96%
DPT Immunization	1%	96%
Primary School Attendance	45%	96%
Primary School Attendance for Girls	33%	98%
GDP per capita	\$954	\$1940



# Innovations Behind the Miracle

- **Grameen Bank** – Muhammad Yunus “invents” microcredit
- **Gonoshasthaya Kendra** – Community-based health project opened pharmaceutical factory in 1981 to ensure generic high quality, essential drugs were affordable
- **Ministry of Primary And Mass Education (MoPME)** – free and compulsory primary education to all students in 1990 (Reaching Out of School Children II)
- **International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)** - Revolutionized delivery of family planning, maternal, and child health



# Creating a “counterfactual”

- Any evaluation of the impact of these programs needs to answer the ‘counterfactual’ question

*What would have happened to those who received the “treatment” if we could go back in time and rerun history without the treatment?*

- With a long term evaluation, we can use populations that lived before the intervention and after
  - Need a LONG timeframe





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# Long-term Evaluation

- Interventions intended to improve health and human capital are common in the developing world
- Few have been introduced in designs that permit full assessment of their impacts
  - Baseline data often not available
  - Comparison group frequently not followed
- Follow-up even when assessment built in
  - Long-term follow-up is rare
  - Evaluation is limited to the short or medium term



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# Motivation: Current Study

- Female education increases value of women's time in economic activities (Asadullah, 2003)
- Produces social gains by improving health, reducing fertility (Subbarao & Raney, 1993)
- Socio-cultural norms in Bangladesh meant women traditionally received little formal education
- Prior research has show dramatic educational gains among women after 1990, all but closing the gender gap (Chowdhury et al, 2003; Ahmed et al 2007)





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# Motivation

- Well known education “gradient” in both health behaviors and health status
  - NOT due to income or occupation choice (Cutler & Lleras-Muney, 2006)
  - Increasing levels of education lead to different thinking and decision-making patterns
  - Willingness to utilize health services, understanding of why it’s important



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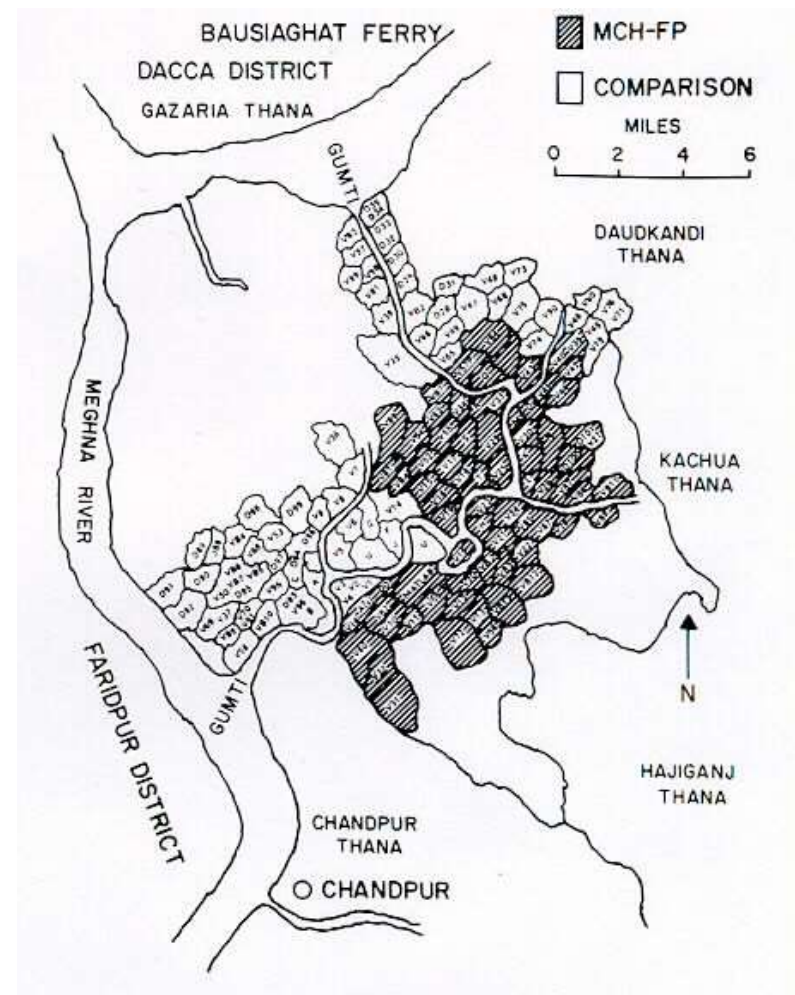
# Study Questions

- Has overall health improved over time?
- Has access to and utilization of care improved over time?
- Are the gains in health and health care access the same for men and women?



# Matlab Thana: icddr,b research site

- Rural area 55km SE of Dhaka
- Site of icddr,b vaccine and ORS research
- Health and Demographic Surveillance System
  - All vital events, 1966-
  - Precise estimation of ages
  - Prospective data on birth, death, migration, marriage
  - Baseline census in 1974
  - GIS data



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# Matlab Health and Socioeconomic Survey (MHSS1): 1996

- Representative survey of 4,700 households, 24,000 individuals in Matlab area (8% sample)
  - Detailed health, labor, SES data
  - Observed health, cognitive tests
  - Community survey data
- Allows models of programmatic effects as child beneficiaries reached adolescence and mother beneficiaries were just exiting childbearing age



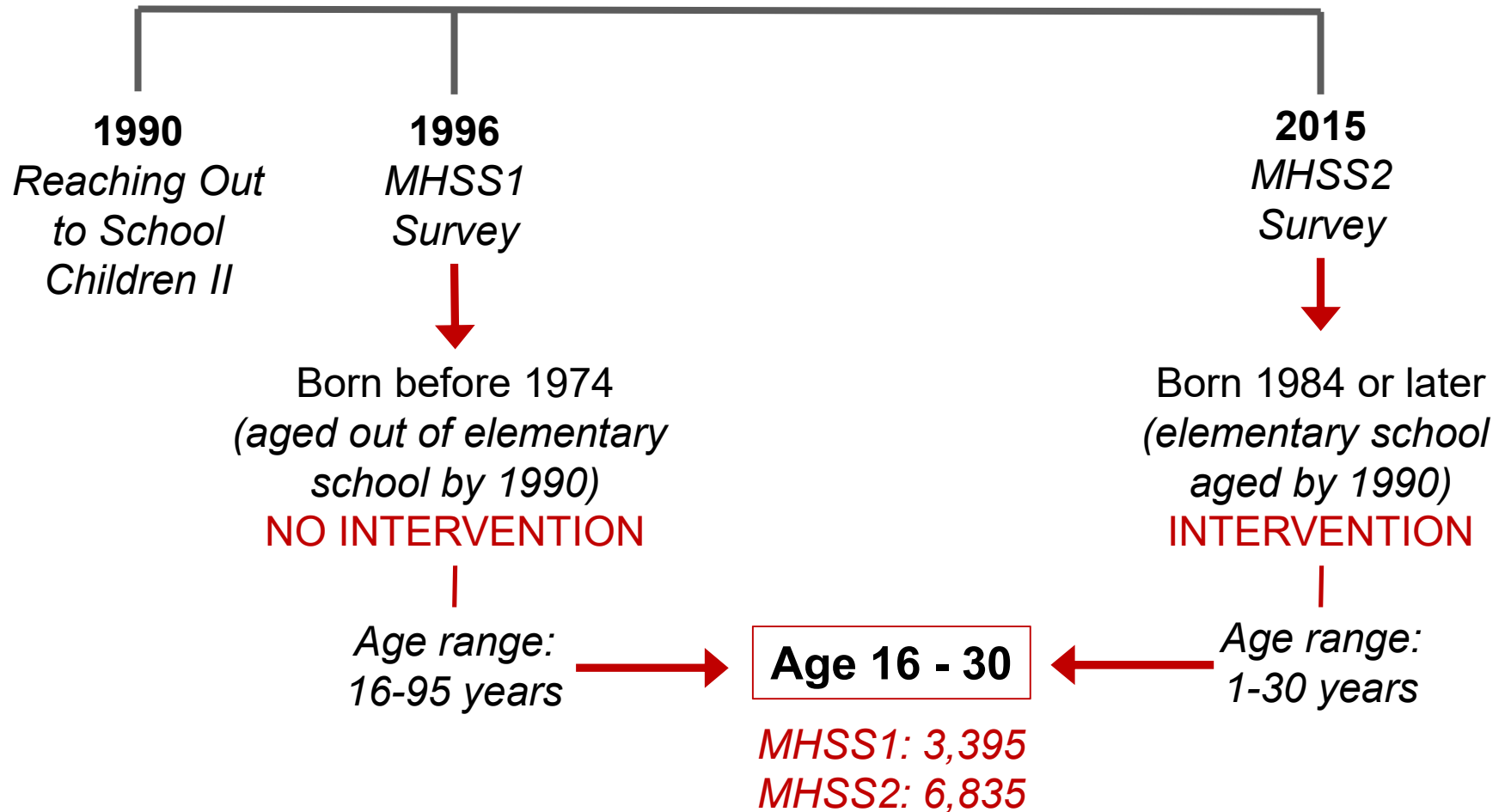
# MHSS2: 2015

- Follows MHSS1 primary sample respondents + all descendants + most spouses + sample of coresidents
  - 10,500 households, 35,000 respondents
- Based on MHSS1 survey (many comparable questions) but some significant modifications
- Community, facility, market price surveys
- Archiving of program data, national facility data

*Matlab Linked Database (MLD) - baseline data, retrospective weights for MHSS and representative sample of those who disappeared <1996*



# Creating the Counterfactual: Sample Selection





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# Data for current study

- Comparable questions on health, access to and utilization of health care (*more on this*)
- Person-level demographics (age, sex, religion, literacy, years of education, marital status)
- Wealth index (assets and housing quality)
- Women's status index (*more on this*)
- Health facilities availability by village



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## General Health:

- What is your current health status? Good, Fair, Poor
- What do you mean by fairly healthy? Better than average health or worse than average health?

## Health Care Need:

- Have you ever needed health care in the last 3 years but did not get it?

## Health Care Utilization:

- In the past year, have you ever stayed overnight in a hospital or health facility as a patient?
- Over the past 12 months, did you receive any health care in a hospital, health facility, clinic or doctor's office where you did not stay overnight?



# Women's Status

Series of 15 questions about freedom of mobility, household decision making, money, work outside the home, etc.:

- When you go outside the *bari* how frequently do you wear a burqa? Hijab?
- How frequently do you go outside the *bari* alone for daily work?
- Do other individuals in your community seek your opinion about important matters?
- Are you consulted/asked to participate in making decisions for the household such as selling rice?



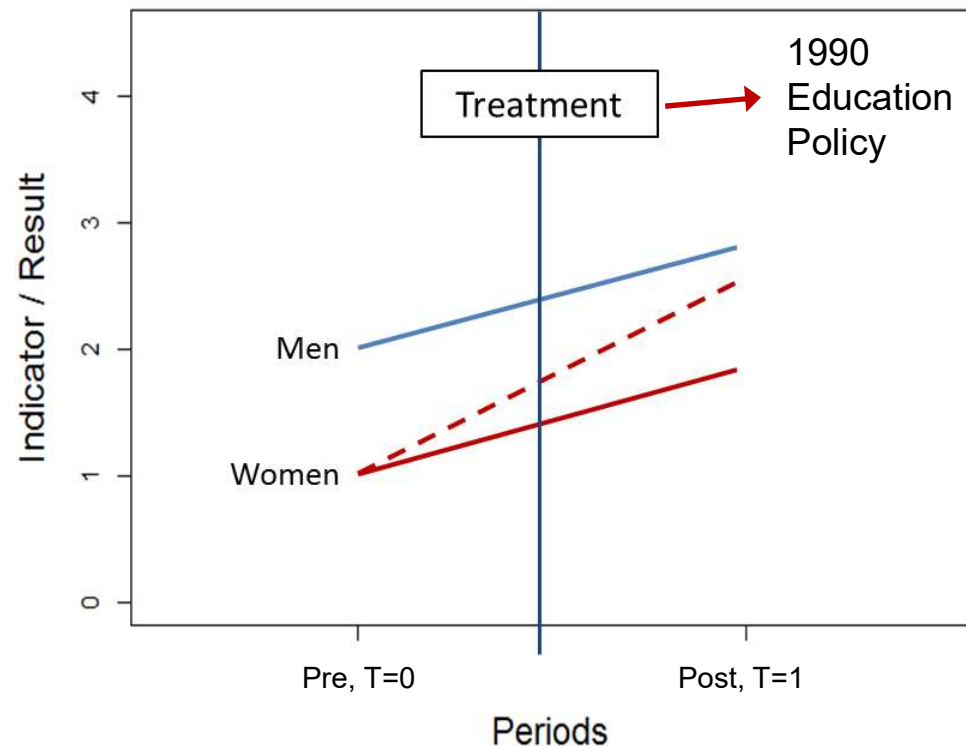
# Statistical Methods

- Principle components analysis to created indices of wealth and women's status
- Examine univariate trends over time for Matlab households: 1996 vs. 2016
- Difference-in-Difference regression models to examine differences by gender over time
  - Repeated Measures GEE with intercluster correlation at household and village



# Difference-in Differences

- Key assumption: the outcome in the two groups follow the same trend over time
- This does not mean that they have to have the same mean of the outcome!



- Looking for a difference in slope to see if women made greater gains over time to “catch up” with men because of education



# Difference-in-Difference Models

$$Y = \mu + \gamma D + \delta T + \beta (D * T) + \varepsilon$$

	2016 (T=1)	1996 (T=0)	2016 - 1996
Men (D=1)	$\mu + \gamma + \delta + \beta$	$\mu + \gamma$	$\delta + \beta$
Women (D=0)	$\mu + \delta$	$\mu$	$\delta$
Men - Women	$\gamma + \beta$	$\gamma$	$\beta$





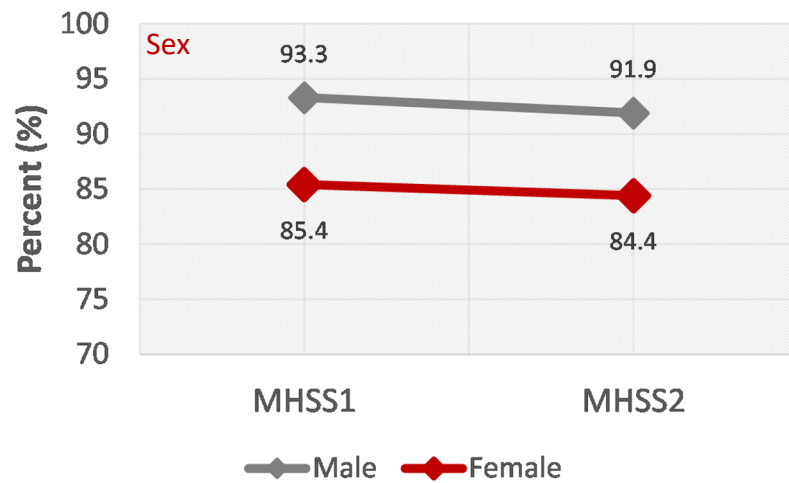
# Health Status and Access to Care

			MHSS1		MHSS2	
	MHSS1	MHSS2	M	F	M	F
<i>Sample Size</i>	3,403	6,835	1,467	1,936	2,676	4,159
Health Status	88.8	87.3*	93.3	85.5	91.9	84.5
Couldn't Get Care	11.8	10.4*	11.5	12.1	4.8	13.9
Hospital Stay	1.6	8.1**	1.2	1.9	3.3	11.3
Outpatient Care	60.5	85.5**	58.6	61.9	84.2	86.3

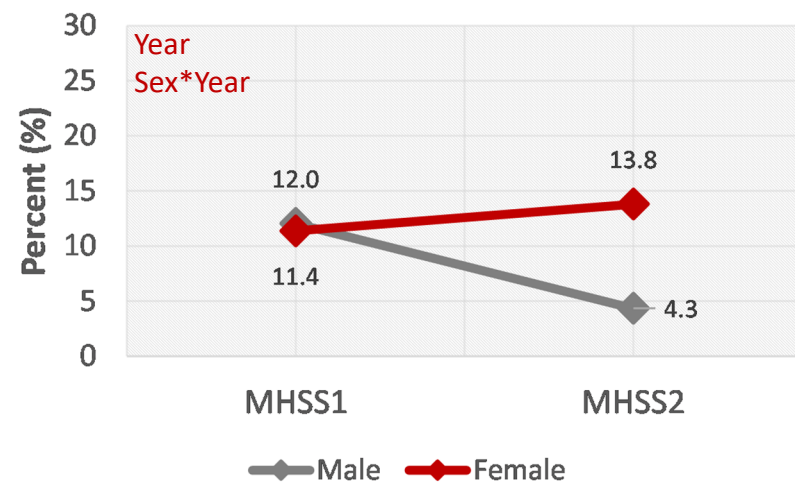
- ↓ health status
- ↓ those who couldn't get care (*only with men*)
- ↑ hospital stays (*especially among women*)
- ↑ use of outpatient care



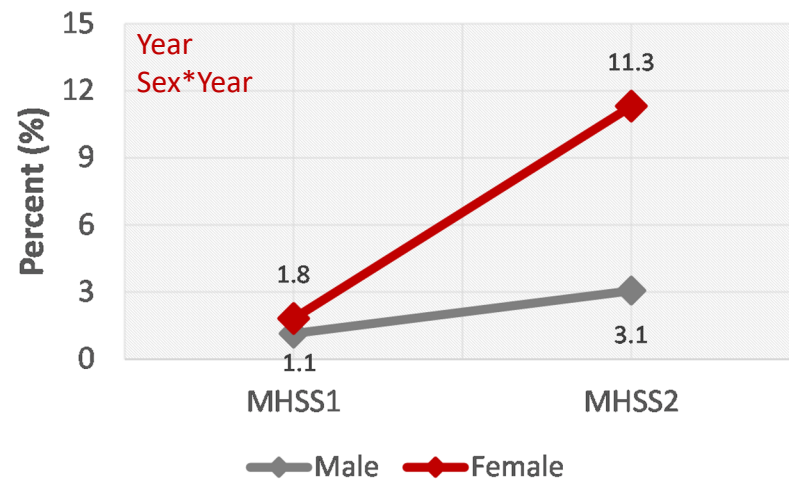
### What is your current health status?



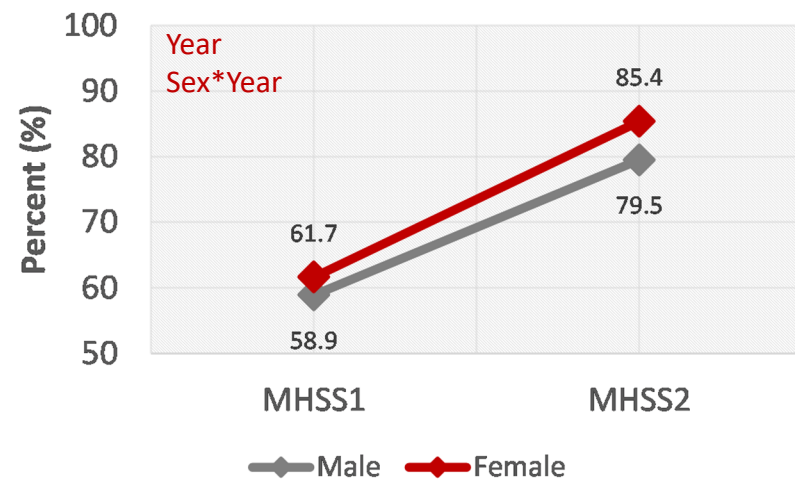
### Needed health care and couldn't get it?



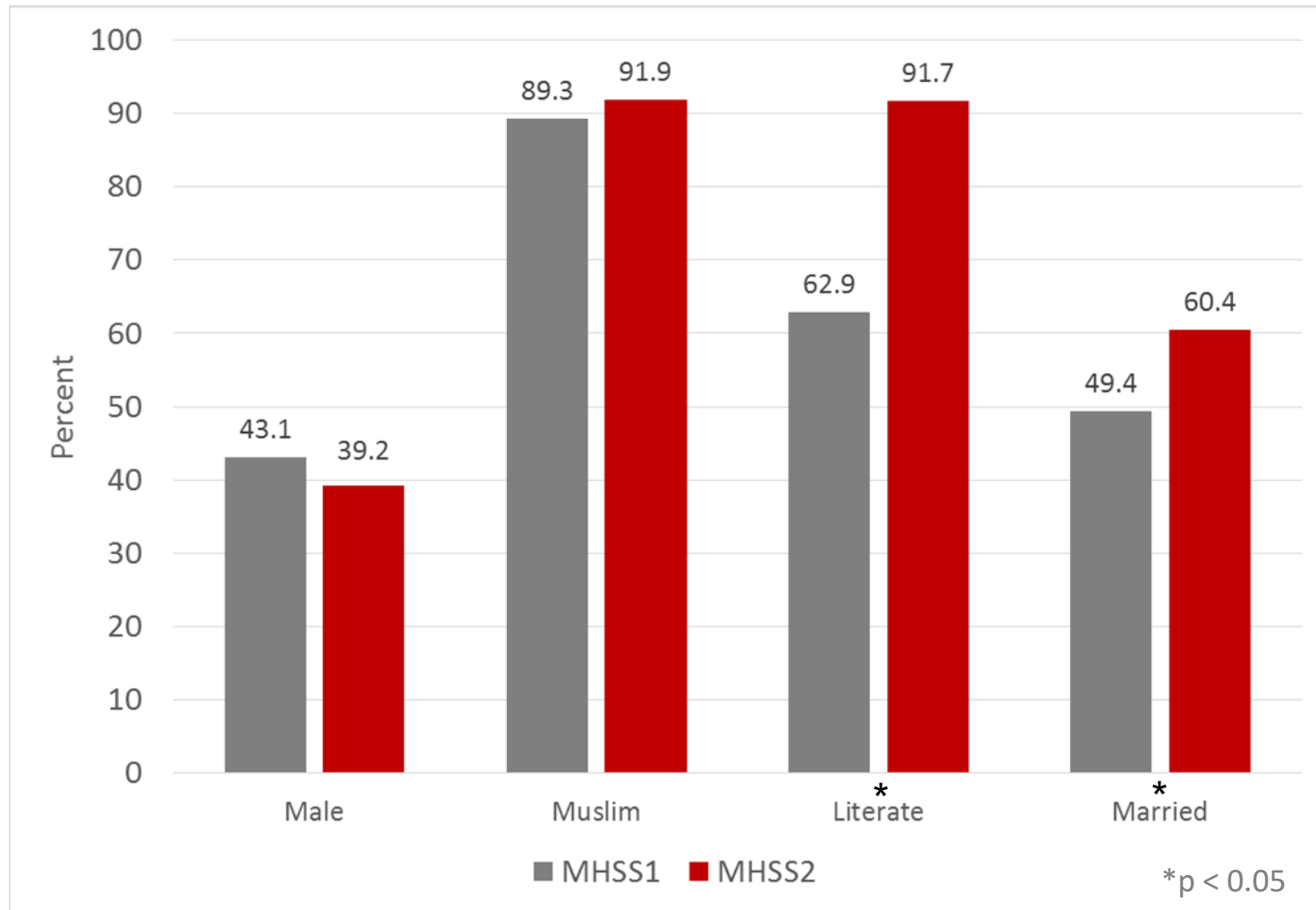
### Stayed overnight in a hospital?



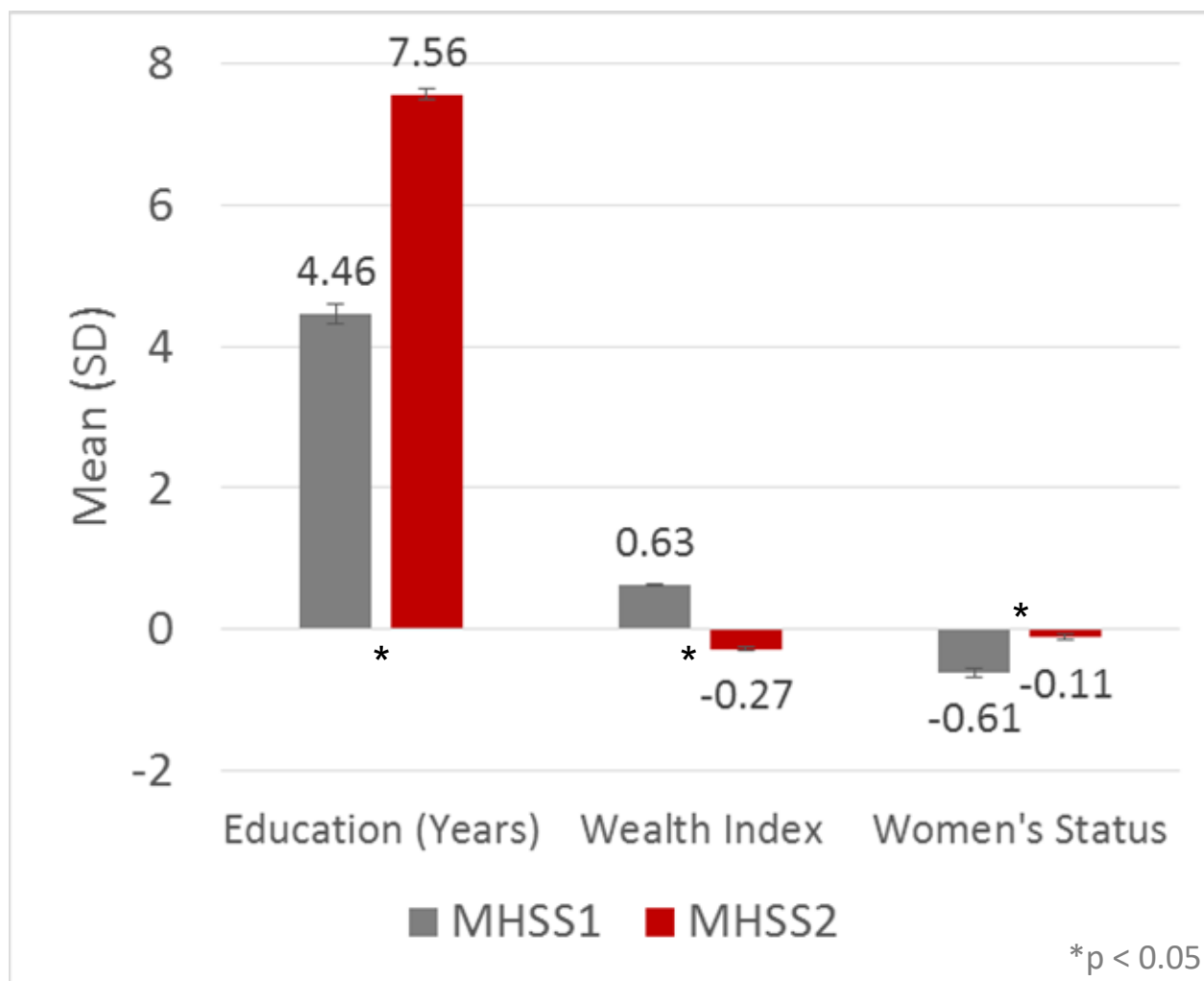
### Received outpatient care?



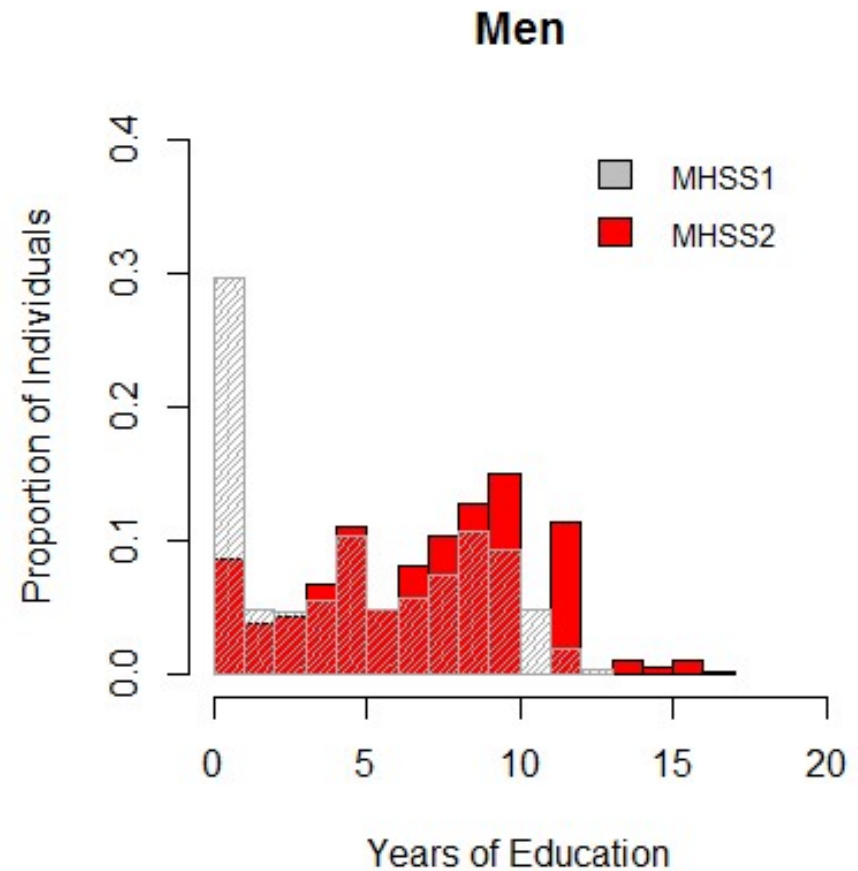
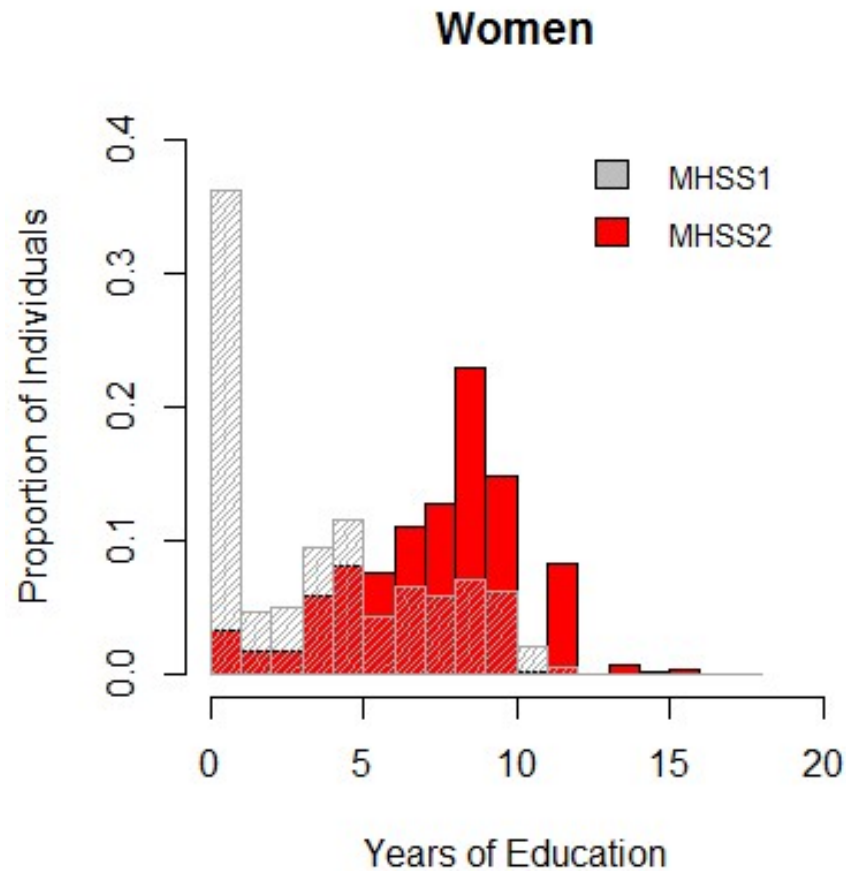
# Sample Demographics



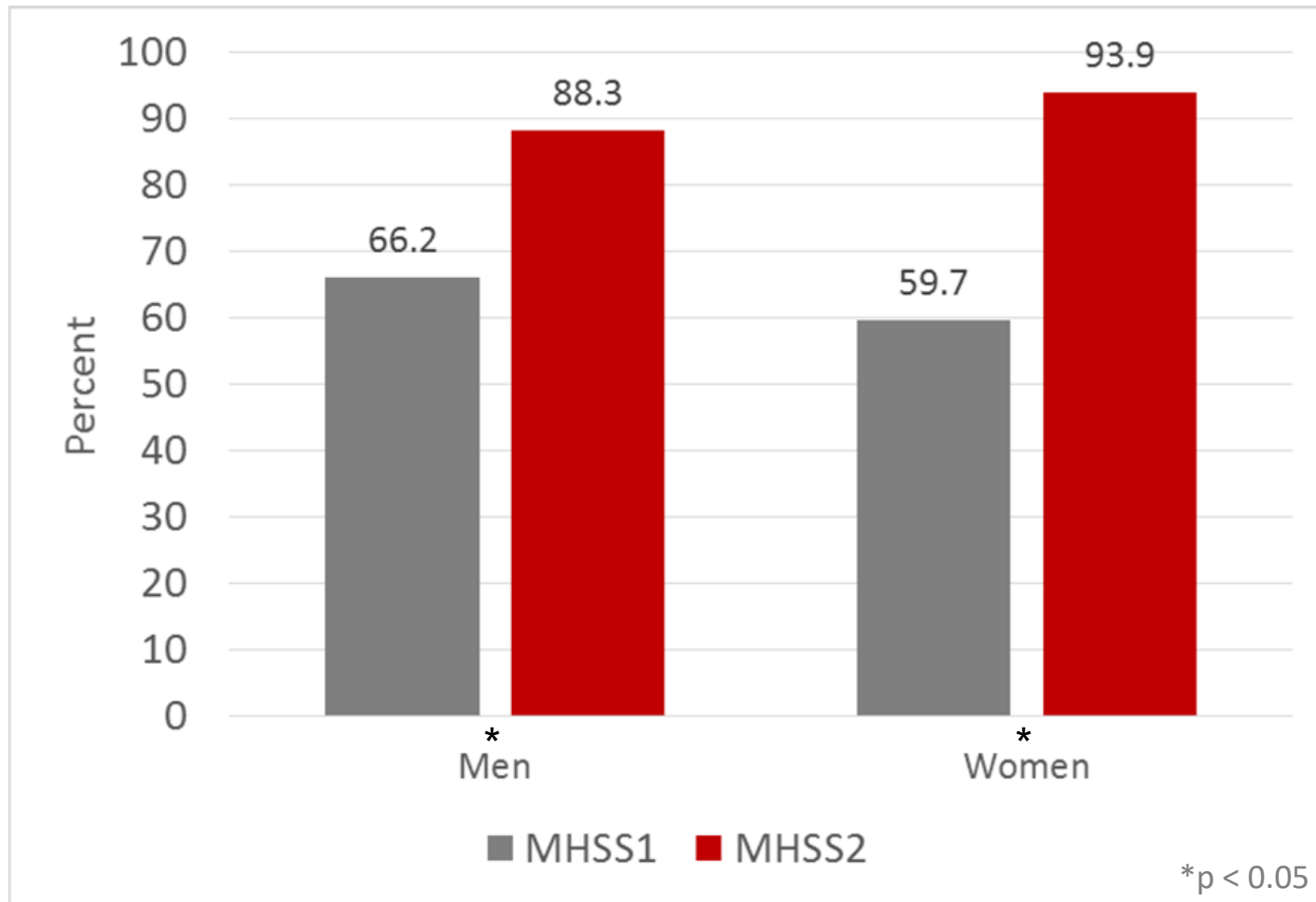
# Sample Socioeconomics



# A closer look at education gains

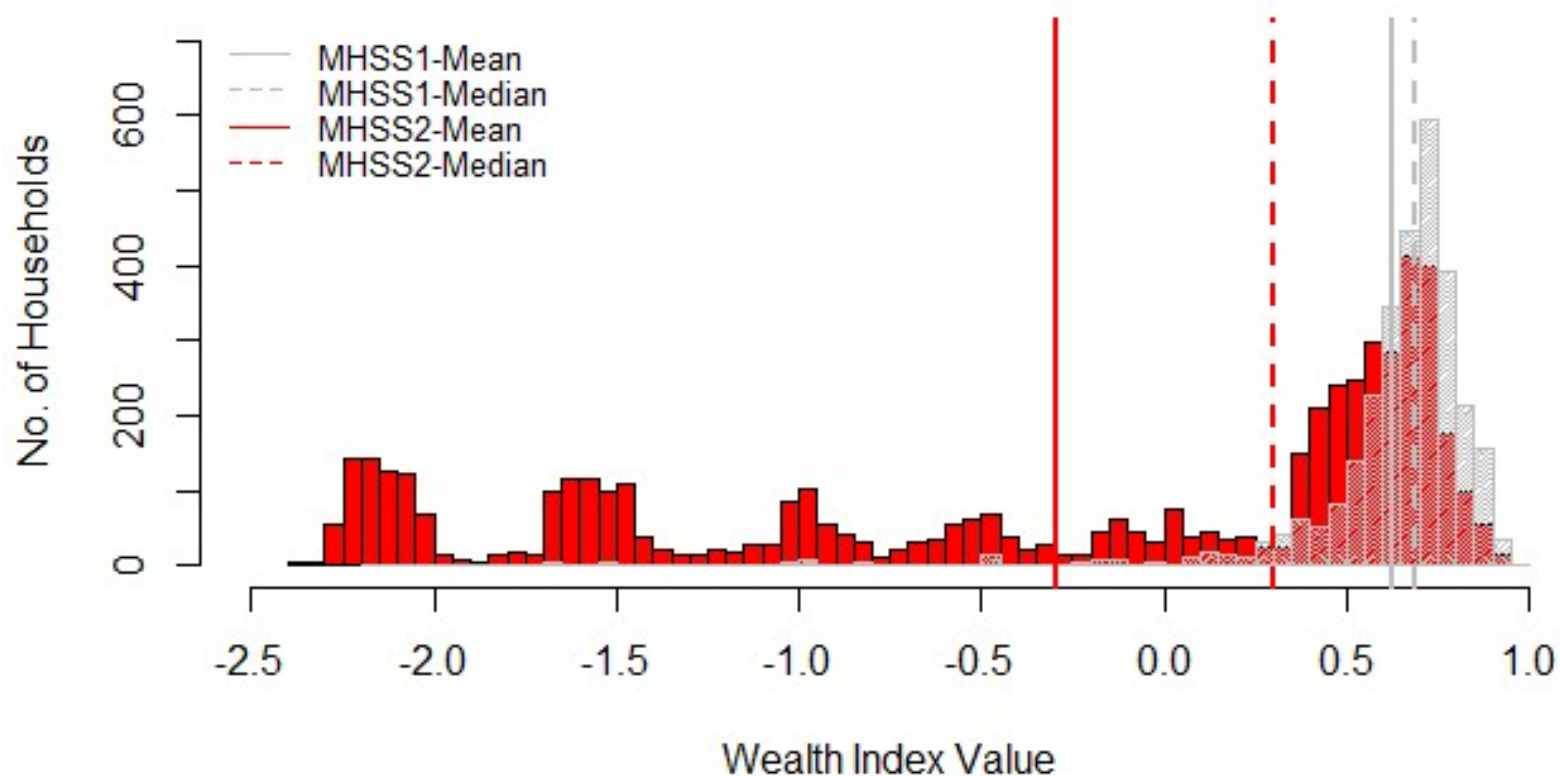


# A closer look at literacy gains





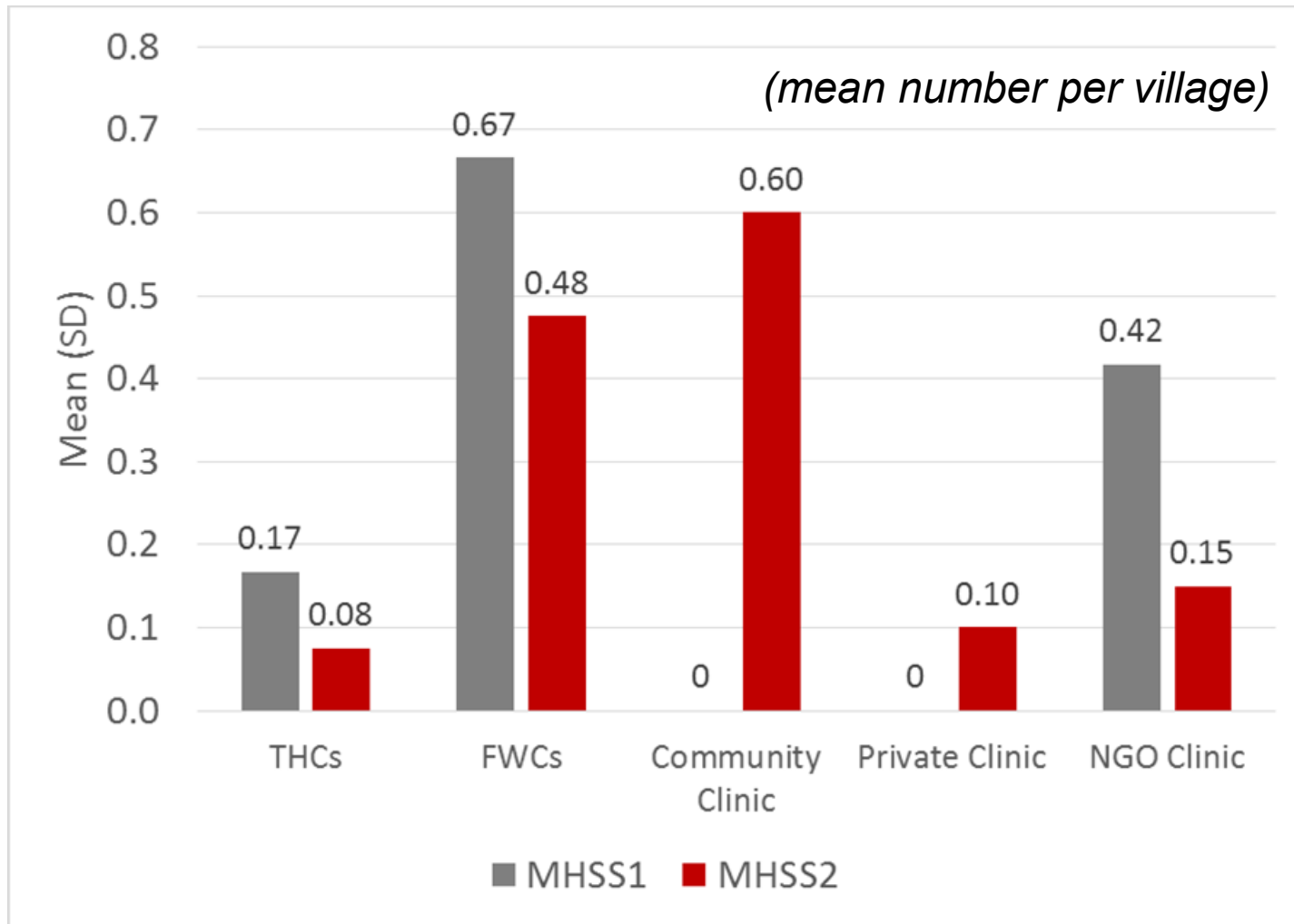
# What's going on with that wealth index?

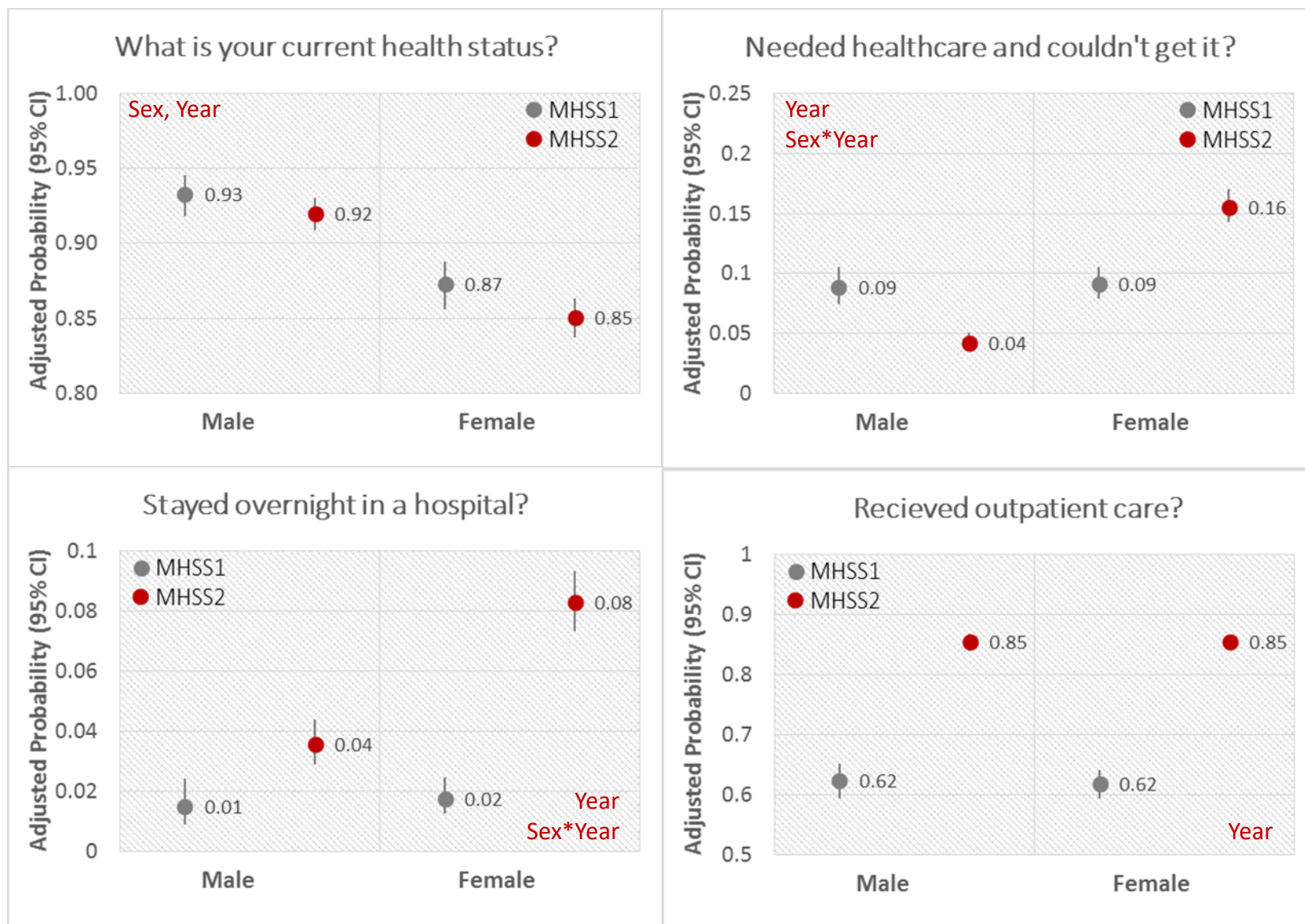


- Large increase in wage labor
- Population growth = smaller agricultural plots (inheritance laws)
- Decrease in subsistence agriculture (fewer farm animals)
- Shift in household assets (cell phones, computers, solar panels)



# Changes in health services





Probabilities adjusted for age, religion, years of education, literacy, marital status, and availability of health facilities



# A few other interesting results

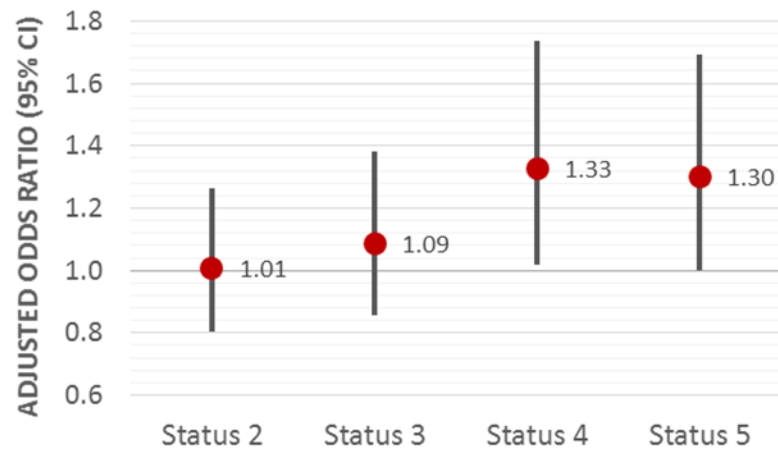
	Current Health Status	Problems getting care	Hospital Stay	Outpatient Care
<i>Age</i>	-0.08 (0.01) ***	0.08 (0.01) ***	-0.03 (0.01) *	0.04 (0.01) ***
<i>Religion</i>	-0.16 (0.11)	0.40 (0.13) **	0.02 (0.15)	0.20 (0.08) *
<i>Education</i>	0.03 (0.01) *	-0.10 (0.01) ***	0.05 (0.01) **	0.00 (0.01)
<i>Literacy</i>	0.02 (0.11)	-0.02 (0.12)	0.20 (0.20)	0.14 (0.09)
<i>Married</i>	-0.07 (0.09)	-0.43 (0.09) ***	1.01 (0.13) ***	0.30 (0.07) ***
<i>THCs</i>	-0.09 (0.21)	-0.03 (0.22)	0.41 (0.25)	0.17 (0.15)
<i>FWCs</i>	-0.01 (0.07)	0.10 (0.07)	-0.18 (0.08) *	0.01 (0.05)
<i>Com. Clinic</i>	-0.30 (0.09) **	0.23 (0.11) *	-0.30 (0.13) *	0.00 (0.10)

Note: Coefficients and SE for full GEE models; \*p<0.05; \*\*p<0.01; \*\*\*p<0.001

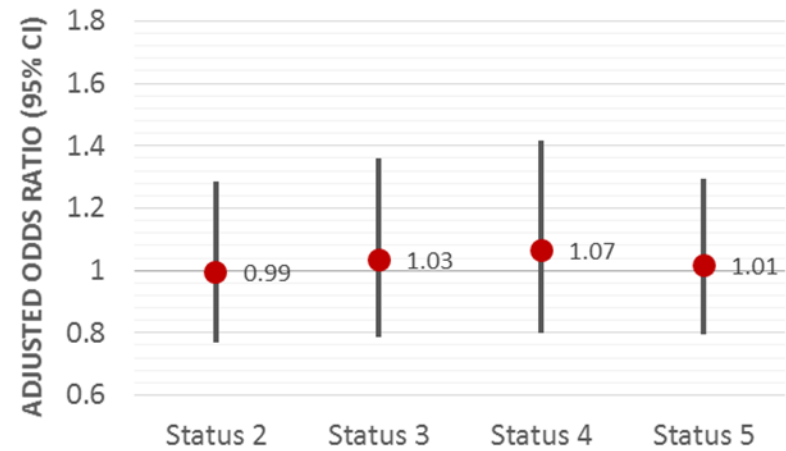
- Still an education effect
- Marriage decreases problems getting care, and increases likelihood of hospital stays and outpatient care
- Increase in community clinics decreases hospital stays (others puzzling)



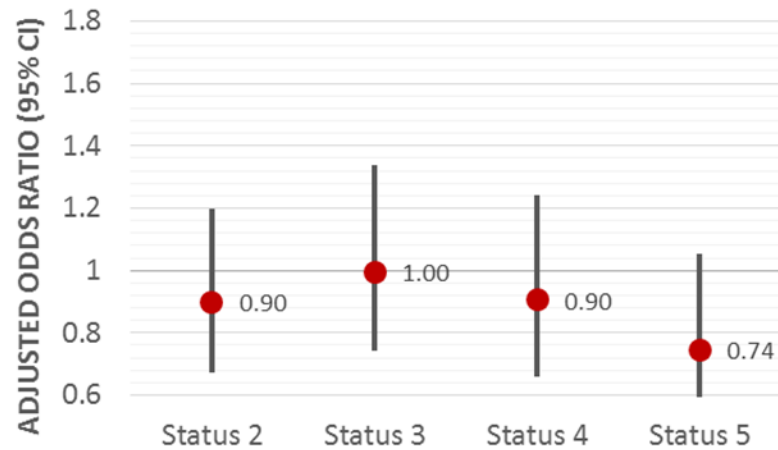
### What is your current health status?



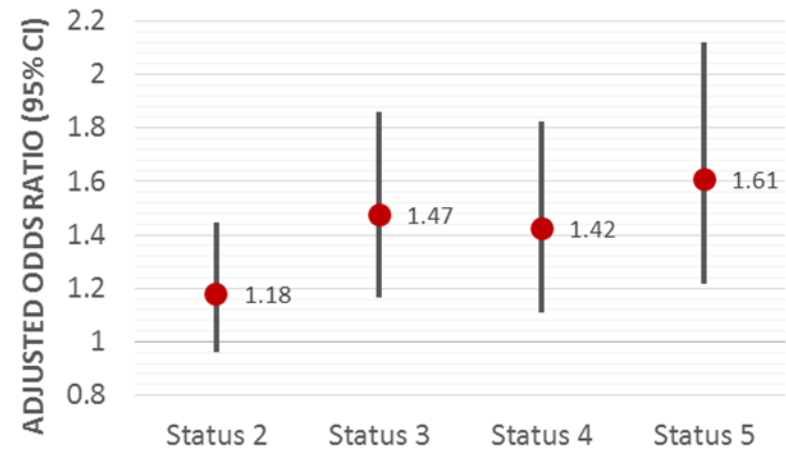
### Needed healthcare and couldn't get it?



### Stayed overnight at a hospital?



### Received outpatient care?



# Final Thoughts

- Does not appear that the “treatment” (1990 education program) has led to larger gains in health/ access to care for women
  - Women still have a problem “getting in the door” (*increase in problems getting care*)
  - No gender difference in outpatient care
  - Women still report lower SRH
- Large gender difference in hospital care
  - Related to increase in hospital births and subsequent stays





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# Final Thoughts

- Good self-rated health appears to have decreased slightly over time
  - Expectations? Worse mental health?
- Women with higher status scores had greater odds of good SRH and use of outpatient care
  - BUT no difference over time – not the mechanism for education/health relationship?
- Need to better measure household wealth so can look at impacts of education/ wealth/women's status



# Funders

- HDSS
  - icddr,b
  - Bilateral and NGO funding to icddr,b
- MHSS1
  - US National Institute on Aging (NIA)
  - National Institute for Child Health and Human Development (NICHD)
  - Penn (PSC)
- MHSS2
  - NIA
  - 3ie (International Initiative for Impact Evaluation)
  - Hewlett Foundation through Population Reference Bureau PopPov Project and Predoctoral Fellowship (Kagy)
  - NSF Predoctoral Fellowship (Jochem)
  - CU (CUPC), Brown (PSTC)



# Partners

- **CU Boulder** Jane Menken, Tania Barham, Nobuko Mizoguchi, Jill Williams
- **OSU** Elisabeth Root
- **UCLA** Randall Kuhn
- **Brown** Andrew Foster
- **icddr,b** Abdur Razzaque, Abbas Bhuiya, Jena Hamadani
- **Independent University, Bangladesh** Omar Rahman
- **Graduate Students** CU Boulder: Gisella Kagy, Chris Jochem, Emily Steiner, Patrick Turner; Brown: Svetoslava Milusheva
- The Staff of **icddr,b** and of **Mitra & Associates**
- The **People of Matlab** and their families

