



A  
C  
E  
R  
H

# Socioeconomic inequalities in early childhood malnutrition-The case of Pakistani children

*Raja Ajmal Jahangeer*

*ACERH- The Australian National University (ANU)  
Canberra, Australia*

*Presented at 5th Annual Emerging Health Policy Research Conference,  
University of Sydney, NSW-Australia  
11 August 2010*

AUSTRALIAN CENTRE  
FOR  
ECONOMIC RESEARCH  
ON HEALTH



THE UNIVERSITY OF  
WESTERN AUSTRALIA





## Background

- High prevalence of malnutrition among children in South Asia & Sub-Saharan Africa
- High prevalence of malnutrition and inequalities in health are among the major public health concerns in developing countries including Pakistan.
- Health indicators improved over the past two decades but health inequalities still widespread in Pakistan
- Many studies concentrate on SES inequalities in child mortality rates, but inequalities in other serious health conditions may also be very important and should not be overlooked



## Objectives of study

### *Objectives*

**To investigate how socioeconomic inequalities are associated with early childhood malnutrition**

**To examine the effects of different SES measurers on inequalities in early childhood malnutrition**



## Data

- **Pakistan Socioeconomic Survey (PSES) conducted in 2001**
- **4022 Households across four provinces**
- **Approximately 30,000 individuals of all ages**
- **Analysis uses data on 2659 children aged 0-59 months**



## *Dependent variable*

**Probability of being stunted (HAZ<-2; stunted=1, 0 otherwise)**

- Using 2006 WHO growth standard data were excluded if a child's HAZ was below -6 or above +6

## *Independent variables*

**Child gender & age, immunization & illness, household SES, parental education & employment, religion and residence/region**

### **Household SES**

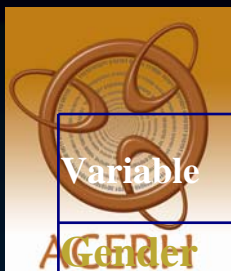
**Principal component analysis was used to construct wealth indices  
SES measured by wealth indices based on**

- a) **ownership of durable assets and housing conditions**
- b) **ownership of durable assets only**
- c) **housing conditions only**
- **Per capita household annual expenditures**



## Econometric Model and Estimation Methods

- **Standard logit regression was applied to look at effects of household SES and other determinants on probability of stunting among children aged 0-59 months**



## Descriptive statistics of stunted children aged 0-59 months

Variable	% of N	% stunted	S.D	Variable	% of N	% stunted	S.D
	100	54.0	49.9	<b>Household SES</b>			
Female	50.6	51.6	50.0	Poorest	19.8	63.4	48.2
Male	49.4	56.4	49.6	Poor	21.2	59.7	49.1
<b>Religion</b>				Middle	20.8	57.0	49.5
Non-Muslim	2.6	60.8	49.2	Rich	19.8	47.3	50.0
Muslim	97.4	53.8	49.9	Richest	18.2	40.8	49.2
<b>Mother's Education</b>				<b>Region</b>			
No education	71.3	59.4	49.1	Urban	32.6	46.9	49.9
Primary	10.8	46.2	49.9	Rural	67.4	57.4	49.5
Secondary	4.6	38.3	48.8	Punjab urban	14.0	42.3	49.5
Higher secondary	8.5	34.8	47.7	Sindh urban	9.2	47.0	50.0
Degree	1.8	26.9	44.8	K.P urban	3.7	49.1	50.2
<b>Father's Education</b>				Balochistan urban	5.6	56.8	49.7
No education	35.5	62.1	48.5	Punjab rural	37.7	52.4	50.0
Primary	18.5	52.9	50.0	Sindh rural	14.9	60.0	49.0
Secondary	12.7	50.1	50.1	K.P rural	8.8	66.3	47.4
Higher secondary	22.4	50.3	50.0	Balochistan rural	6.0	69.0	46.4

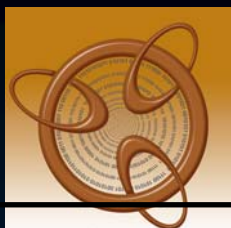


# Bivariate Logit regression

	Model 1		Model 2		Model 3		Model 4	
	Assets & housing conditions		Assets only		Housing cond only		Log of per capita expenditures	
Household SES	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
Poorest	0.923*	0.124	0.742*	0.121	0.883*	0.125		
Poor	0.768*	0.121	0.673*	0.121	0.903*	0.123		
Middle	0.656*	0.121	0.546*	0.121	0.474*	0.123		
Rich	0.265**	0.122	0.264**	0.118	0.311**	0.125		
Log of per capita annual expenditures							-0.392*	0.072
Constant	-0.374*	0.089	-0.283***	0.086	-0.378*	0.092	3.652*	0.643

*Richest is reference category*

\* Statistically significant at 1 percent, \*\* Statistically significant at 5 percent, \*\*\* Statistically significant at 10 percent



## Determinants of stunting among children aged 0-59 months (Logit estimates)

ACERH	Model 1		Model 2		Model 3		Model 4	
	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
<b>Mother's education</b>								
<i>No education (Ref)</i>								
Primary	-0.278**	0.136	-0.308**	0.135	-0.286**	0.135	-0.332**	0.134
Secondary	-0.551*	0.202	-0.591*	0.2	-0.546*	0.201	-0.613*	0.198
Higher secondary	-0.690*	0.179	-0.714*	0.177	-0.681*	0.177	-0.738*	0.172
Degree	-0.828**	0.376	-0.847**	0.377	-0.816**	0.375	-0.830**	0.375
<b>Father's education</b>								
Primary	-0.183	0.117	-0.204***	0.117	-0.197***	0.117	-0.192***	0.116
Secondary	-0.215	0.137	-0.248***	0.137	-0.215	0.136	-0.239***	0.136
Higher secondary	-0.027	0.125	-0.061	0.125	-0.035	0.125	-0.064	0.125
Degree	-0.233	0.219	-0.266	0.218	-0.249	0.218	-0.257	0.219
<b>Household SES</b>							-0.12	0.094
Poorest	0.421**	0.197	0.168	0.174	0.418**	0.191		
Poor	0.328***	0.179	0.238	0.162	0.449**	0.177		
Middle	0.271***	0.16	0.213	0.152	0.12	0.164		
Rich	-0.028	0.147	-0.065	0.139	0.114	0.148		
<i>Richest (Reference)</i>								

\* Statistically significant at 1 percent, \*\* Statistically significant at 5 percent, \*\*\* Statistically significant at 10 percent



# Logit estimates

	Model 1		Model 2		Model 3		Model 4	
	Coef	S.E	Coef	S.E	Coef	S.E	Coef	S.E
<b>Religion</b>								
Muslim	-0.558**	0.27	-0.555**	0.27	-0.556**	0.27	-0.567**	0.271
<b>Region</b>								
<i>Punjab urban (Reference)</i>								
Sindh urban	0.138	0.176	0.136	0.176	0.125	0.176	0.136	0.176
K.P urban	0.460***	0.239	0.479**	0.239	0.440***	0.241	0.459**	0.239
Balochistan urban	0.459**	0.204	0.481**	0.204	0.425**	0.207	0.518**	0.204
Punjab rural	-0.009	0.146	0.07	0.139	-0.027	0.15	0.117	0.136
Sindh rural	0.158	0.176	0.272	0.169	0.148	0.181	0.325**	0.164
K.P rural	0.680*	0.196	0.752*	0.191	0.660*	0.201	0.762*	0.191
Balochistan rural	0.451**	0.227	0.608*	0.215	0.391***	0.232	0.680*	0.212
Constant	-0.382	0.423	-0.288	0.425	-0.355	0.417	0.925	0.9
Log likelihood	-1725.648		-1727.31		-1725.42		-1729.9	
$\chi^2$	214.06		210.74		214.51		205.65	
Prob > $\chi^2$	0.000		0.000		0.000		0.000	
Pseudo R2	0.058		0.058		0.059		0.056	
N = 2659, * Statistically significant at 10 percent, ** Statistically significant at 5 percent, *** Statistically significant at 1 percent								



## Conclusions

- Prevalence of early childhood malnutrition (stunting among 0-59 months children) is very high (54%) in Pakistan
- Widespread socioeconomic inequalities exist in early childhood malnutrition
- Higher socio-economic status is associated with a statistically significant reduction in stunting
- Children living in poorest households are significantly ( $p < 0.05$ ) more likely to be stunted compared to children living in richest households
- Parental education and child religion are also significantly and negatively associated whereas child age & gender and living in a region are positively associated with ( $p < 0.05$ ) malnutrition



## Policy implications

- Targeted development policies and programs need to be instituted that ensure improvement in household economic position
- Parental education is another key area that need to be focussed as parental education has significant association with child malnutrition
- Urban/rural, inter-provincial and intra province gaps exist in child malnutrition
- Public health & infrastructure programs need to target the remote rural areas and reduce the regional disparities in malnutrition among preschool children