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Physical Environment and Health of Children in Four Developing Countries

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¹ Young Lives International Study of Childhood Poverty;
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Tropical Medicine.



Young Lives 

HSRC RESEARCH OUTPUTS

3725



Acknowledgments

The Young Lives National Teams

in Ethiopia, India, Peru, and Vietnam,

without whose enormous effort this project would not be possible.

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The project team currently includes about 50 researchers and policy/advocacy specialists.

The project is funded by the UK Dept. for International Development (DFID)



Overall Aims of the Young Lives project

- **To produce good quality, long-term panel data (over 15 years) about the changing nature of the lives of children living in poverty**
- **To trace linkages between key policy changes and child welfare**
- **To inform and respond to the needs of policy makers, planners and other stakeholders**



Objectives for the Environmental Health component

- To provide information on the role of the physical environment in the health and wellbeing of poor children.
- To explore progress towards the Millennium Development Goals within subgroups of the poor (by degree of poverty, urban/rural).



Progress towards the Millennium Development Goals

MDG 7: Ensure environmental sustainability

- Target 10: halve, by 2015, the proportion of people without sustainable access to safe drinking water
- Target 11: by 2020, to have achieved a significant improvement in the lives of at least 100 million slum dwellers
 - primarily interpreted as meaning access to improved sanitation, land tenure and housing

Source: Millennium Declaration 2000
<http://www.un.org/millenniumgoals/>



Monitoring progress toward the MDGs

Water

- Improved water source = piped into dwelling/tubewell into dwelling/public standpipe or tubewell;
- Unimproved water source = none/other

Sanitation

- Improved sanitation = flush toilet or septic tank/private latrine;
- Unimproved sanitation = public or shared latrine/none/other

Air quality

- Reducing indoor air pollution from cooking fuels such as wood, charcoal, crop residues, dung and coal.



Conceptual framework

External determinants	Mediating determinants	Outcomes
<ul style="list-style-type: none"> ● Child ● Household ● Physical environment ● Socio-economic status ● Assets ● Social capital ● Economic shocks ● Community resources 	<ul style="list-style-type: none"> ● Child care ● Child education ● Work ● Play ● Safety ● Health care use ● Child's social capital ● Family environment ● Migration 	<ul style="list-style-type: none"> ● Development stage for age ● Perceptions of wellbeing ● Nutritional status ● Life skills ● Physical morbidity ● Mental morbidity



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Methodology

Sentinel sites – purposive sampling of nearly 12,000 children in poor and less poor areas

<i>Questionnaires</i>	Ethiopia	India	Peru	Vietnam
Community – key informants	20 x n	20 x n	20 x n	20 x n
1 yr old households – caregiver	20 x 100	20 x 100	20 x 100	20 x 100
8 yr old households – caregiver	20 x 50	20 x 50	20 x 36	20 x 50
8 yr old – child	20 x 50	20 x 50	20 x 50	20 x 50
<i>Totals</i>	3000	3000	2767	3000

n varied between 1 and 5 per site



Instruments

Community Questionnaires (key informants)

- population size, general housing characteristics, and levels of pollution.

Household Questionnaires (1 & 8 yr old caregivers)

- household composition and overcrowding
- child health (recent illness, illness or injuries in last 3 years, long term health problems)
- socio-economic status (incl. housing quality, fuel, sanitation)

Child Questionnaire (8 yr olds)

- perceptions of well-being (likes and dislikes about their immediate environment)



Water, sanitation, electricity (%)

Household Data (1yr olds)	Ethiopia	India	Peru	Vietnam
Has electricity	36	82	65	85
<i>Main source of drinking water</i>				
Piped into dwelling/yard	12	17	77	10
Tubewell into dwelling/yard	41	8	7	23
Public standpipe/tubewell	42	57	8	0
Unprotected well/spring/pond/river	5	17	9	41
Other	0	2	0	27
<i>Improved water supply (WHO def)*</i>	95	82	92	33
<i>Sanitation</i>				
Flush toilet	1	20	44	22
Pit latrine (household)	20	8	26	27
Pit latrine (communal)	13	4	1	0
None	58	68	18	36
Other	4	1	11	15
<i>Improved sanitation (WHO def)**</i>	21	28	70	49

Main fuel used for cooking

	Ethiopia %	India %	Peru %	Vietnam %
Wood	64	73	52	64
Kerosene/paraffin	8	7	11	10
Charcoal	4	0.1	1	5
Gas/electricity	1	19	34	17
Coal	0.2	0.3	0.2	3
Cow dung	23	0.5	1	0
None	0.2	0	0.2	0.1
Other	1	0.3	1	1
Non-polluting	9	26	45	27
Polluting*	91	74	55	72

*Polluting = wood/charcoal/coal/cow dung



Community data - Infrastructure and Transport

	Ethiopia		India		Peru		Vietnam	
	C	HH	C	HH	C	HH	C	HH
Electricity	46	36	99	82	50	65	84	85
Irrigation	36		63		57		67	
Piped water	62	64	51	74	70	85	26	10
Cement/tar road	38		61		31		100	
Public transport takes people out of community	57		89		72		97	



Health Outcomes: Acute Respiratory Infections and use of polluting cooking fuels

Outcome	OR (95% CI)			
	Ethiopia	India	Peru	Vietnam
Severe pneumonia in last 24 hours	1.62 (1.01-2.85)	2.88 (1.56-5.30)	0.74 (0.56-0.99)	1.18 (0.74-1.88)
Severe pneumonia or other ARI in last 24 hours	1.65 (1.02-2.67)	1.79 (1.28-2.51)	0.94 (0.72-1.23)	1.24 (0.83-1.86)



Health Outcomes: Diarrhoea

1 yr olds

Exposure	OR (95% CI)			
	Ethiopia	India	Peru	Vietnam
Improved water source*	0.58 (0.42-	0.55 (0.36-	0.53 (0.34-	0.97 (0.66-
AND sanitation**	0.79)	0.83)	0.81)	1.44)
vs one/both unimproved				

Diarrhoea defined as 3 or more loose or watery stools OR blood in stools (last 24 hours)



Health Outcomes: Diarrhoea

1 yr olds

	OR (95% CI)			
Exposure	Ethiopia	India	Peru	Vietnam
Unimproved water and sanitation	1.00	1.00	1.00	1.00
Either water or sanitation improved	0.76 (0.61-0.95)	1.24 (0.79-1.94)	1.35 (0.66-2.78)	0.57 (0.36-0.91)
Both water and sanitation improved	0.51 (0.36-0.70)	0.65 (0.37-1.15)	0.66 (0.33-1.34)	0.76 (0.50-1.17)
<i>Trend OR</i>	0.73 (0.64-0.85)	0.79 (0.62-1.02)	0.68 (0.50-0.94)	0.86 (0.69-1.08)



Health Outcomes: nutrition

	Ethiopia	India	Peru	Vietnam
Wasting (acute malnutrition)	41	45	10	23
Stunting (chronic malnutrition)	39	27	25	16



**Interaction effects of *education*,
services (water, sanitation etc) and
health outcomes (stunting at 1 yr)**

In Peru...

- **maternal education is a powerful determinant of nutritional status (HAZ)**
- **service access is associated with HAZ**
- ***BUT*... service access is more important for mothers with low education levels. Not so for higher levels of maternal education. This endorses investment in services where levels of maternal education are low.**



What do the children think?

Child's perception of <u>water</u> quality	Key informants said air/water pollution is severe		
	Ethiopia %	India %	Vietnam %
Good	67	93	78
Average	8	6	18
Bad	24	1	4
Child's perception of <u>air</u> quality			
Good	75	89	65
Average	6	9	26
Bad	18	2	9



Conclusions

- The Young Lives dataset contains baseline information of relevance for monitoring progress towards the MDGs.
- Links to health outcomes are complex and show substantial local variations.
- Children appear to be generally unaware of the health hazards associated with poor quality air and water.
- YL Round 2 (2006) will include more qualitative studies which can explore the interactions between environment and health in greater depth.






Photo: Thea de Wet

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