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Physical Environment and Developing Countries Health of Children in Four

Seager J 1,2, Harpham T 1,3, Huttly S 1,4, Abramsky

Bank University; ⁴ London School of Hygiene and ² Human Sciences Research Council; ³ London South Young Lives International Study of Childhood Poverty; Tropical Medicine



Young Lives in Toung

HSRC RESEARCH OUTPUTS

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Acknowledgments

in Ethiopia, India, Peru, and Vietnam, The Young Lives National Teams without whose enormous effort this project would not be possible.

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University of Reading; London School of Hygiene and Tropical Medicine; London South Bank University; University of Sussex; Save the Children UK; University of Johannesburg; and Human Sciences Research Council

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

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

Environmental Health component Objectives for the

To provide information on the role of the wellbeing of poor children. physical environment in the health and

To explore progress towards the poverty, urban/rural). subgroups of the poor (by degree of Millennium Development Goals within



Millennium Development Goals Progress towards the

MDG 7: Ensure environmental sustainability

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

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





Conceptual framework

 Child Household Physical environment well environment well Socio-economic Assets Social capital Economic shocks Community resources 	External determinants
 Child care Child education Work Sarah Sarah Childs social capital Family environment Migration 	Mediating determinants
 Development stage for age stage for age Perceptions of wellbeing Nutritional status Life skills Physical morbidity Mental morbidity 	Outcomes



Conceptual framework

External	Mediatina	Outcomes
determinants	determinants	
• Child	• Child care	 Development
Household	 Child education 	stage for age
Physical	• Work	Perceptions of
environment		relibeing
• Socio-Economic	Supprison of the control of the cont	Nurritional
• Assets	Plaulifi eure une	
• Social eaphrai	O child's social	Dhine Salls
• Economic shocks	(ap)Fa	morbidity
Community	Family	Mental
resources	Migration	morbidity



Methodology

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

3000	2767	3000	3000	Totals
20 × 50	20 x 50	20 x 50	20 × 50	8 yr old - child
20 × 50	20 x 36	20 x 50	20 × 50	8 yr old households - caregiver
20 × 100	20 × 100	20 × 100	20 × 100	1 yr old households - caregiver
20 x n	20 x n	20 × n	20 x n	Community - key informants
Vietnam	Peru	India	Ethiopia	Questionnaires

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 (%)

49	70	28	21	Improved sanitation (WHO def)**
15	11	1	4	Other
36	18	68	58	None
0	-	4	13	Pit latrine (communal)
27	26	8	20	Pit latrine (household)
22	44	20	1	Flush toilet
				Sanitation
33	92	82	95	Improved water supply (WHO def)*
27	0	~	0	Other
41	9	17	51	Unprotected well/spring/pond/river
0	8	57	42	Public standpipe/tubewell
23	7	œ	41	Tubewell into dwelling/yard
10	77	17	12	Piped into dwelling/yard
				Main source of drinking water
85	65	82	36	Has electricity
Vietnam	Peru	India	Ethiopia	Household Data (1yr olds)



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	2.0	0.3	0.2	ω
Cow dung	23	0.5	-	0
None	0.2	0	0.2	0.1
Other	1	0.3	-	5
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	<u>。 エ</u>	C	Ŧ	C	五	C ∓
Electricity	46 ₃₆ 99	36	99	82	50 65		84 85
Irrigation	36		63		57		67
Piped water	62	64 51	51	74	70 85	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 (9:	OR (95% CI)	
	Ethiopia	India	Peru	Vietnam
Severe	1.62	2.88	0.74	1.18
pneumonia	(1.01-	(1.56-	(0.56-	(0.74-
in last 24	2.85)	5.30)	0.99)	1.88)
hours				
Severe	1.65	1.79	0.94	1.24
pneumonia	(1.02-	(1.28-	(0.72-	(0.83-
or other	2.67)	2.51)	1.23)	1.86)
ARI in last				·
24 hours				

Young Lives ****

Health Outcomes: Diarrhoea 1 yr olds

Exposure		OR (95%	5% CI)	
	Ethiopia	India	Peru	Vietnam
Improved	0.58	0.55	0.53	0.97
water source*	(0.42-	(0.36-	(0.34-	(0.66-
AND	0.79)	0.83)	0.81)	1.44)
sanitation**				
vs one/both				
unimproved			-	

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





Health Outcomes: Diarrhoea 1 yr olds

	-
Peru	Vietnam
1.00	1.00
1.35	0.57
(0.79-1.94) (0.66-2.78) (0.36-0.91)) (0.36-0.91)
0.66	0.76
(0.37-1.15) (0.33-1.34) (0.50-1.17)) (0.50-1.17)
0.68	0.86
(0.64-0.85) (0.62-1.02) (0.50-0.94)	50-0.94) (0.69-1.08)
	1.00 1.35 94) (0.66-2.78 0.66 [5) (0.33-1.34 0.68 0.68)2) (0.50-0.94



Health Outcomes: nutrition

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



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

In Peru...

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



What do the children think?

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

Conclusions

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







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Developing Countries Physical Environment and Health of Children in Four

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COQ



Conceptual framework

External determinants	Mediating determinants	Outcomes
• Child	• Child care	 Development
 Household 	• Child education	stage for age
● Physical	• Work	Perceptions of
environment		wellbeing
Socio-economic	D'Suifany	ONutritional
• Assets	Openition are use	A COLUMN
• Social capitals	O Child's social	SKIIIS
• Economic shocks	sapital	monhidity
Community	• Family	Mental
	 Migration 	morpidity



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environment		Wellbeing
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• Assets	O Flantin or's use	
Social eapiral	Definions seemi	Divisional Services
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Gas/electricity		19	34	17
Coal	0.2	0.3	0.2	3
Cow dung	23	0.5	1	0
None	2.0	0	0.2	0.1
Other	—	0.3	1	1
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	C	C II	C	Ŧ	C	HH C	C	至
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Health Outcomes: Diarrhoea

		OR (95%	% CI)	
Exposure	Ethiopia	India	Peru	Vietnam
Unimproved water	1.00	1.00	1.00	1.00
and sanitation				
Either water or	0.76	1.24	1.35	0.57
sanitation improved	(0.61-0.95)	(0.79-1.94) (0	(0.66-2.78)	.66-2.78) (0.36-0.91)
Both water and	0.51	0.65	0.66	0.76
sanitation improved	(0.36-0.70)	(0.37-1.15) (0		.33-1.34) (0.50-1.17)
Trend OR	0.73	0.79	0.68	0.86
	(0.64-0.85)	(0.62-1.02) (0	•	50-0.94) (0.69-1.08)



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What do the children think?

Bad	Average	Good	quality	Child's perception of air	Bad	Average	Good	quality	Child's perception of water				
18	6	75			24	00	67			%	Ethiopia	air/water	Key i
2	9	89				6	93			%	India	air/water pollution is severe	Key informants said
9	26	65			4	18	78			%	Vietnam	is severe	said

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