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Young Lives
An International Study of Childhood Poverty

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Preface

This paper is one of a series of working papers published by the Young Lives project, an innovative longitudinal study of childhood poverty in Ethiopia, India (Andhra Pradesh state), Peru and Vietnam. Between 2002 and 2015, some 2,000 children in each country are being tracked and surveyed at 3-4 year intervals from when they are 1 until 14 years of age. Also, 1,000 older children in each country are being followed from when they are aged 8 years.

Young Lives is a joint research and policy initiative co-ordinated by an academic consortium (composed of the University of Reading, the London School of Hygiene and Tropical Medicine, London South Bank University and the South African Medical Research Council) and Save the Children UK, incorporating both interdisciplinary and North-South collaboration.

Young Lives seeks to:

- Produce long-term data on children and poverty in the four research countries

- Draw on this data to develop a nuanced and comparative understanding of childhood poverty dynamics to inform national policy agendas

- Trace associations between key macro policy trends and child outcomes and use these findings as a basis to advocate for policy choices at macro and meso levels that facilitate the reduction of childhood poverty

- Actively engage with ongoing work on poverty alleviation and reduction, involving stakeholders who may use or be impacted by the research throughout the research design, data collection and analyses, and dissemination stages

- Foster public concern about, and encourage political motivation to act on, childhood poverty issues through its advocacy and media work at both national and international levels.

In its first phase, Young Lives has investigated three key story lines – the effects on child well-being of (i) access to and use of services, (ii) social capital, and (iii) household livelihoods. This working paper is one of a series which consider an aspect of each of these story lines in each country. As a working paper, it represents work in progress and the authors welcome comments from readers to contribute to further development of these ideas: you can contact Young Lives via the website www.younglives.org. uk

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Abstract

In Vietnam there is growing concern about the potential social impact of rapid economic changes. The extent and type of social connectedness, or social capital, may be changing. Studies from other developing countries have demonstrated that social capital is often independently associated with various indicators of well-being, including some aspects of human capital (health and education status). In Vietnam there has only been one previous quantitative study of social capital and this did not consider associations with well-being. The Young Lives project in Vietnam allows the examination of the relationship between maternal social capital and child well-being. With a sample of 1,953 mothers of one-year-olds and 954 mothers of eight-year-olds across five provinces, this study examines whether maternal social capital is associated with child health.

This study found low levels of structural social capital (associational life) and citizenship and high levels of cognitive social capital (trust, etc) and support. While poorer women have even lower levels of structural social capital than their better-off peers, patterns across rural and urban areas are similar.

Maternal social support and high cognitive social capital show the most consistent associations with child health, while associations between maternal social capital and child health are stronger among one-year-old children than among eight-year-olds, with the exception of child mental health and risk of life-threatening illness. The most consistent associations were seen with the mental health of eight-year-olds, with all four indicators of social capital being significantly associated with mental health after other variables have been controlled for. Lastly, there was some evidence to suggest that active membership of formal organisations in Vietnam may be damaging to the health of eight-year-olds but not one-year-olds, with active participation in formal groups being significantly associated with an increase in stunting among eight-year-olds.

The main components of social capital associated with child health are social support and cognitive social capital. High levels of maternal social support are positively correlated with having an educated partner, living in an urban area and better maternal mental health. High cognitive social capital is positively correlated with living in a rural area, having an occupation other than agriculture and better maternal mental health.

There is a need to focus on maintaining the high levels of cognitive social capital and raising the current low level of maternal structural social capital in Vietnam.

Key words: social capital, child health, Vietnam, quantitative

Contents

1. Introduction

1.1 Economic growth, inequality, urbanisation and social exclusion in Vietnam

There are currently a number of different economic and demographic factors that may affect social relations in Vietnam. Rapid economic growth, growing inequalities, urbanisation and social exclusion are briefly considered below.

Rapid national **economic growth** is often accompanied by a weakening of social ties, or connectedness (Grootaert and van Bastelaer, 2002). Vietnam is undergoing a period of rapid economic change and its achievements in terms of poverty reduction have been heralded by donors and by the Vietnam Government as one of the great success stories of economic development (Joint Donor Report, 2003; GoV, 2003). A decade of GDP growth figures averaging around 7 per cent per annum have underpinned a halving of income-expenditure-consumption poverty from 58 per cent of the population in 1993 to 29 per cent in 2002.

Social ties between and within communities can also be severed in a context of growing **inequalities**. The gap between the poorest quintile of Vietnam and the richest has been widening both in terms of income and expenditure since 1993. The Gini co-efficient increased from 0.35 in 1992/93 to 0.37 in 1997/98 and was up to 0.41 in 2002 (World Bank, 2003). The situation of the minority ethnic population is especially worrying: while the poverty rate for the majority population declined from 54 per cent in 1993 to 29 per cent in 2002, the poverty rate for minority ethnic communities remains high and only declined from 86 per cent to 70 per cent in the same period. In fact, following improvements in the period 1993-1998, severe poverty among the poorest minority ethnic communities actually increased in many regions from 1998 to 2002 (UNCT, 2003).

Changes in social connectedness can also result from demographic phenomena such as urbanisation, migration and the ageing of a population. **Urbanisation** is a particularly important phenomenon in Vietnam. By 2020 it is estimated that 55 per cent of the population will live in cities compared to less than 25 per cent today (UNCT, 2003). Recent estimates have suggested that one million people a year are migrating to Vietnam's cities (Joint Donor Report, 2003). New migrants to the cities currently face a double disadvantage in the loss of their traditional social networks and the discriminatory policies with regard to access to basic services, housing and poverty alleviation programmes (Save the Children UK, 2003 and Joint Donor Report, 2003).

Social exclusion in Vietnam is tackled head on by formal state safety nets targeted at the excluded, poor and vulnerable (for example, the Hunger Eradication and Poverty Reduction programme – HEPR; and Programme 135). However, questions have been raised by the donor community about the effectiveness of the targeting and the subsequent impact of these formal safety nets. Coverage rates are low: it is estimated that Programme 135 reaches 28 per cent of the poor, while HEPR activities only reach 6-13 per cent of the poor. Furthermore, findings on the impact of HEPR access are mixed: while improvements have been found in school enrolment, no positive correlation has been found with household expenditure or with better health outcomes (Joint Donor Report, 2003). Community consultations carried out in six provinces in 2001 in order to formulate the government's poverty reduction strategy based on its interim Poverty Reduction Strategy (i-PRSP) also found widespread

dissatisfaction with social safety net coverage and impact – particularly in terms of fee exemption policies in health and education (Shanks and Turk, 2002). And another study concluded that with respect to the financing of social protection measures, the major cost of risk management is paid for by households and communities, and the main beneficiaries of state-provided measures are the relatively well-off rather than the relatively poor (Conway and Turk, 2002). In this context of incomplete coverage by formal social safety nets, the role of informal social safety nets – or social support – becomes particularly important.

Opportunities for informal (beyond familial) social support in Vietnam may be increasing. Vietnam's emerging civil society shows signs of increasing non-state, voluntary, not-for-profit, civic organisations built around common interests and issues, seeking to improve the well-being of their members or the well-being of others. This may have more to do with economic reform policy since doi moi[1] in 1985 than specific legislation regarding civil society organisations during the same period (Wischermann and Vinh, 2003; Dalton, 2002 and Pedersen, 2001). Others are less optimistic. Participatory poverty assessments carried out in 2003 in 43 communes across all regions of the country by a variety of different organisations, following a common framework, found that the participation of local people in planning, decision-making and implementation of local development plans is limited (Joint Donor Report, 2003). Nevertheless, a growing civil society addressing social and economic problems offers new and diversified opportunities for individuals to form new social relationships, increase social connectedness and develop informal safety nets.

The potential for at least a slowing down of progress on poverty reduction, together with worrying signs of increasing inequality, new social trends and inadequate formal safety nets, suggests that this is a good time to deepen the debate on how social capital can play a role in Vietnam's development, how social connections between individuals, households and communities, and the support which may flow from those connections, contributes to human development, poverty reduction, and in this particular case, child well-being.

1.2 This study's approach to social capital

Social capital is most commonly associated with the research of Bourdieu (1986), Coleman (1990) and Putnam (1993). 'In attempting to find non-economic factors to explain the success of certain economic processes, these authors draw on concepts such as trust, participation in civil society and social networks, all of which form the "social capital" of a given community' (van Kemenade, 2002 p.7). Social capital is one of five assets in the livelihoods conceptual framework developed by DFID (the others being physical, human, natural and financial assets). However, there is ongoing debate as to whether it is truly a form of 'capital' (eg, see Arrow, 2000). Research has shown it to have an independent effect on various economic and other welfare indicators, including physical and mental health (Grootaert and van Bastelaer, 2002; De Silva *et al*, 2005). Social capital can be thought of as the 'value' of social relationships, reflecting the quality and quantity of social relationships in a given population, most commonly those within a community. Indeed, Quibria (2003) suggests that social capital has become shorthand for 'community'.

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1   *Doi moi* marks a renovation period starting from 1989 when a series of adjustment reforms were initiated in order to boost economic growth and reduce poverty in Vietnam.

Although some writers claim that the negative side of social capital is still ignored (eg, Quibria, 2003), most social capital research these days acknowledges that high levels of social capital, in some contexts, can be associated with exclusion of outsiders, restrictions on individual freedoms and reinforcement of harmful norms. Another, more fundamental, criticism of a focus on social capital is that it emphasises the 'social' of development at the expense of the 'economic'. However, many, including the current authors, welcome the additional attention to non-market social interactions.

The approach to social capital in Young Lives avoids focussing on *either* trust, norms, etc, *or* interactions but considers both, as recommended by most recent texts on social capital (eg, Dasgupta and Serageldin, 2000). However, this study recognises the importance of *separating out* structural social capital (objective measures of what people 'do', such as membership of networks) from cognitive social capital (subjective measures of what people 'feel', such as notions of trust and reciprocity) (Harpham, Grant and Thomas, 2002). It is important to separate these indicators of social capital as they may not be correlated. All measures refer to the 'community' therefore this study only addresses bonding (within community) social capital and not bridging (linking to other communities or institutions) social capital. This study also avoids covering both the causes and consequences (or outcomes) of social capital in the measure of social capital itself. As Portes (1998) and Quibria (2003) point out, this still happens in some studies.

Current research views social capital as both the property of individuals (the direct impact of an individual participating in a network), and as an ecological characteristic (the indirect impact of networks irrespective of participation in those networks). Individual social capital is measured by asking an individual about their own participation in networks (structural), and about the quality of those networks, for example whether they are trusting (cognitive). Ecological social capital is measured by asking a representative sample of the community the above issues, and aggregating the answers to the community level, providing the same score of social capital for every person in the community. For the purposes of this paper, social capital is regarded as a characteristic of individuals and not as an ecological variable.

This study is the first quantitative examination of maternal social capital in Vietnam that considers the correlates of maternal social capital and its effect upon child health. High levels of maternal social capital may positively affect child health by enabling mothers to access more services (health, education, childcare), by enabling them to access more assets (jobs, money, durables, etc), and by being positively related to maternal physical and/or mental health. While previous research in developed and developing countries has demonstrated positive associations between adult social capital and various adult (or household) indicators of well-being, the association between maternal social capital and child health has not previously been examined (Productivity Commission, 2003).

2. Methods

2.1   Sample

This study uses data from the Young Lives project, an international study of childhood poverty in Ethiopia, India, Peru and Vietnam. Full details of the sample selection for the Vietnamese part of this study can be found at www.younglives.org.uk. Briefly, a random sample of 100 one-year-olds and 50 eight-year-olds was taken from each of 20 sentinel sites, over-sampled to include poor areas, making a total of 2,000 one-year-olds and 1,000 eight-year-olds. These 20 sentinel sites comprised 31 communes, or communities. The child's primary caregiver was interviewed, and for the purposes of this study the sample was restricted to biological mothers, resulting in 1,953 mothers of one-year-olds, and 954 mothers of eight-year-olds.

2.2   Measures

Social capital was measured using a shortened version of the A-SCAT tool developed by Harpham, Grant and Thomas (2002) – a series of ten yes/no questions. The questionnaire has been qualitatively validated in Vietnam. *Structural social capital* was measured by (1) asking respondents about active membership of formal (women's union, co-op, trade union, political/social) and informal (religious, credit, life insurance, sports) groups in their community during the last year; (2) by recording support received from informal (family, relatives, neighbours, friends, religious leaders) and formal (commune leaders, government officials, politicians, NGOs) networks during the last year; and (3) by asking about joining together with other community members to address an issue/problem and communication with community leaders (see Table 3). *Cognitive social capital* was measured by asking respondents questions about trust, sense of belonging, community harmony and perceived fairness.

The health outcomes for one-year olds include nutritional status, physical health status perceived by the mother in comparison to other children, perceived long-term health problem, whether the child has been so sick the mother thought they might die, injury or accidents since birth, and illness in the last 24 hours (measured using questions developed by WHO for screening diarrhoea and acute respiratory infection (ARI). Three indicators were used to measure nutritional status: weight-for-age z-scores (WAZ), height-for-age z-scores (HAZ), and weight-for-height z-scores (WHZ). All were computed using the NutStat module of EpiInfo 2002 with the WHO International Growth Reference as a standard,[2] and a cut-off point of –2 SD used to classify cases of malnutrition.

The health outcomes for eight-year-olds include all those listed above, and mental health. Child mental health was measured using the Strengths and Difficulties Questionnaire (SDQ) with a Total Difficulties Score ranging from 0 to 40 generated by summing the scores from four scales (emotional symptoms score, conduct problem score, hyperactivity score and peer problem score). A score of <=13 was classified as 'normal', 14-16 'borderline' and >=17 'abnormal'.

Other factors which may confound the association between maternal social capital and child health, or be determinants of maternal social capital, were explored. These comprise: maternal factors (age, religion, ethnicity, education level, occupation, number of years lived in commune, and mental health status measured using the SRQ20 with a cut-off of 7/8 to determine a probable case of common

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2   NutStat is a nutrition anthropometry programme that calculates percentiles and z-scores using either the 2000 CDC or the WHO growth reference (www.cdc.gov/EpiInfo/). In analysis of YL Vietnam child nutritional status, we used the WHO growth reference option, as the 1983 WHO Reference Growth Charts continue to be preferred for international comparison.

mental disorder); partner factors (partner at home, age, education, occupation); household factors (household wealth, number of economic shocks in last three years, number of children under five in household); child factors (age, sex) and community factors (rural/urban).

Household wealth is measured using a household wealth index (WI) – a score between zero and one constructed as an average of three components: (1) housing quality, which is the simple average of rooms per person, floor, roof and wall; (2) consumer durables, being the scaled sum of nine consumer durables (radio, bicycle, TV, electric fan, motorbike, refrigerator, landline, mobile phone and car/truck); and (3) services of drinking water, electricity, toilet and fuel. The wealth index is divided into four groups: <0.25 'poorest', 0.25-<0.5 'very poor', 0.5-<0.75 'less poor', >=0.75 'better off'.

2.3   Fieldwork and ethics

Ethical approval was granted by the Vietnamese Union of Scientific and Technological Associations, London South Bank University, London School of Hygiene and Tropical Medicine and Reading University, UK. Data were collected in late 2002, with household interviews performed by the General Statistical Office (GSO) staff and anthropometric measurements taken by the Hanoi Research and Training Center for Community Development (RTCCD) research team.
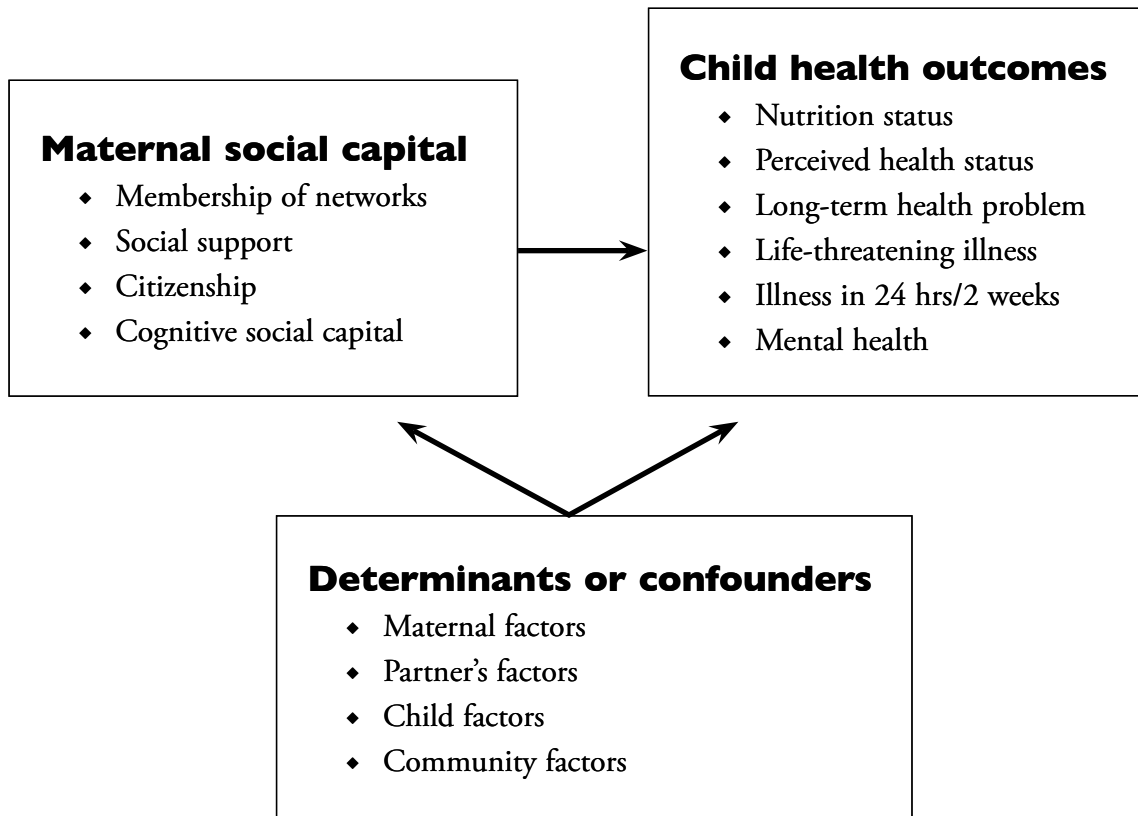
2.4   Data analysis

Data were analysed using the 'survey commands' in Stata 8.0 (StataCorp, 2003). Sampling weight factor (pweight) was the reverse of the probability of eligible children being sampled in each sentinel site. Strata was defined as sentinel site, and primary sampling unit as the household.

The analysis followed the conceptual framework outlined in Figure 1. Firstly, the distribution of child health outcomes and maternal social capital by age of child, location (rural/urban) and household wealth index was explored using Pearson chi-square tests for categorical variables and t-tests for continuous variables, corrected for the survey design. Given the situation in Vietnam, where the role of government in civil society life has been changing since the country moved away from a centrally planned towards a marked-based approach to social development, the concepts of 'formal' – belonging to the government – and 'informal' – established and sustained independently from the government, group or network, are used in analysing structural social capital. Secondly, appropriate multivariable models (either linear or logistic) for each child health outcome were fitted to explore the association between each specific dimension of maternal social capital and child health outcomes, controlling for potential confounding factors. To clarify the concept of formal/informal group membership and social support received, models were built with the following variables: any versus none, any formal versus none, and any informal versus none.

The predictors of those maternal social capital components found to be significantly associated with child health outcomes were subsequently explored in additional multivariable models.

Figure 1: Conceptual framework

Maternal social capital
- Membership of networks
- Social support
- Citizenship
- Cognitive social capital

Child health outcomes
- Nutrition status
- Perceived health status
- Long-term health problem
- Life-threatening illness
- Illness in 24 hrs/2 weeks
- Mental health

Determinants or confounders
- Maternal factors
- Partner's factors
- Child factors
- Community factors

3. Results

3.1   Descriptive results

Child health outcomes

Child health outcome indicators are necessarily different for one-year-olds compared to eight-year-olds. The analyses below will therefore link child outcomes to either the social capital of the mothers of one-year-olds or the mothers of eight-year-olds.

Figures 2 and 3 describe nutritional outcomes by sex and location for each child age group. According to international standards, the prevalence of underweight children is high in both one- and eight-year-old groups (from 20 to<30% WAZ<-2SD). In contrast, stunting rates are low (<20% HAZ<-2SD) in one-year-olds and medium (from 20 to <30%) in eight-year-olds. In both age groups boys and children living in rural areas have worse nutritional indicators than girls and children living in urban areas.

Tables 1 and 2 present indicators of child health by sex and location for one-year-olds and eight-year-olds respectively. Eight-year-olds are more than three times more likely to suffer from long-term health problems than one-year-olds, while 21 per cent of eight-year-olds are probable cases of mental illness. In contrast to the nutritional indicators, few significant differences between rural and urban areas, or between girls and boys for either age group are found with the physical health indicators. However, children of both ages living in rural areas, and one-year-old boys rather than girls, were more likely to have suffered from a life-threatening illness.
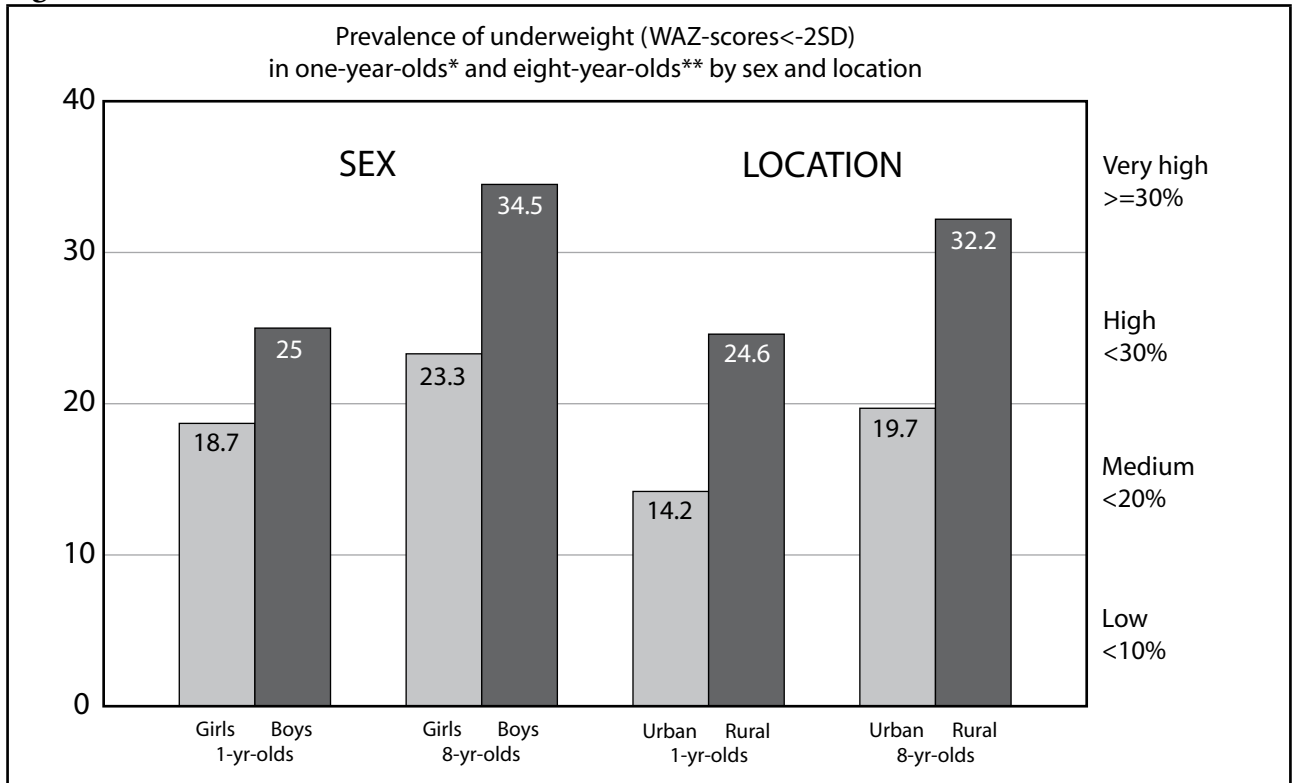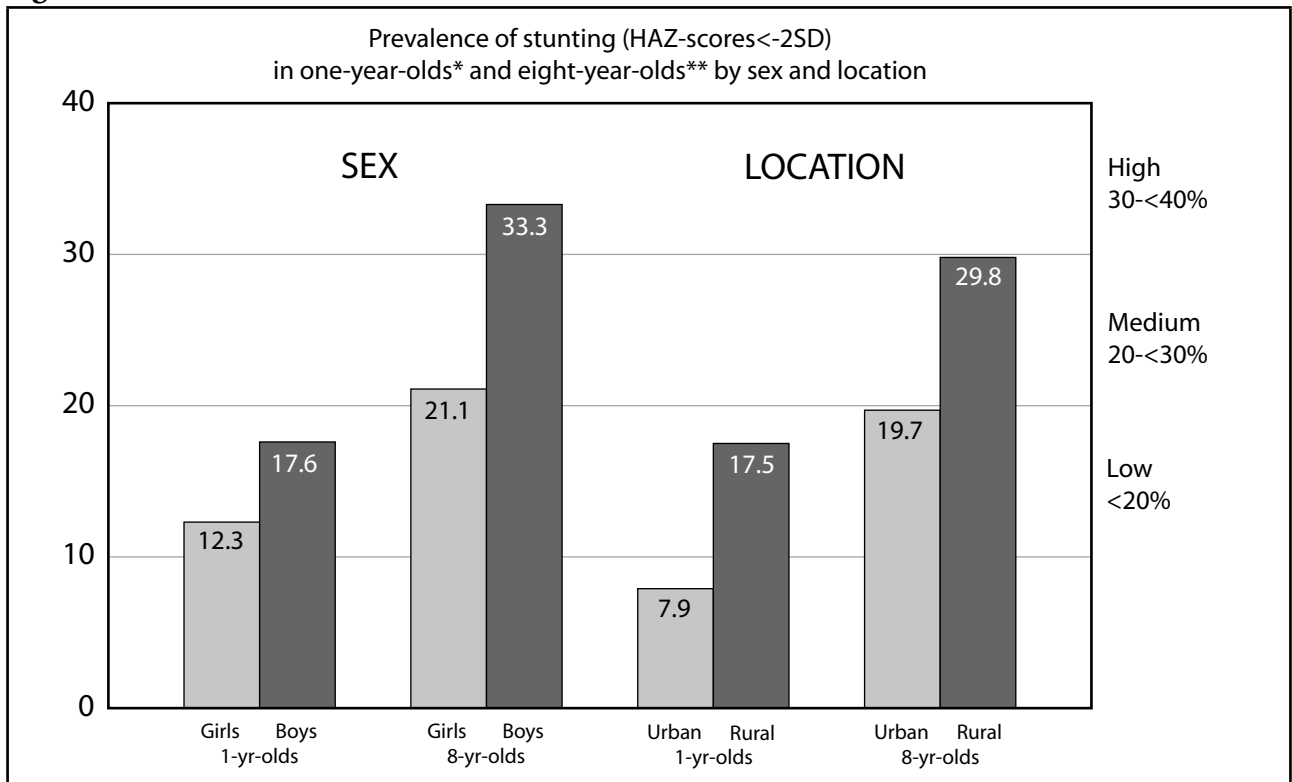
Figure 2

Prevalence of underweight (WAZ-scores<-2SD)
in one-year-olds* and eight-year-olds** by sex and location

Figure 3

Prevalence of stunting (HAZ-scores<-2SD)
in one-year-olds* and eight-year-olds** by sex and location

* Overall prevalence of stunting in 1-year-olds: 15.0%, ** 8-year-olds: 27.2%

Table 1: Indicators of child health of one-year-olds by gender and location

Child health outcomes	Total n=1953	Girl n=945	Boy n=1008	Rural n=1567	Urban n=386
Health outcomes reported by mother					
% perceived health worse than others	27.8	27.3	28.2	28.0	27.3
% having long-term health problems	4.4	3.5	5.2	3.7*	6.1
% life-threatening event since birth	13.3	11.2*	15.2	14.5*	9.6
% had any injury/accident since birth	9.0	8.9	9.1	9.4	8.0
% had illness in last 24 hours	17.4	15.1*	19.5	17.2	18.0
Nutrition outcome measured on child [a]	n=1946	n=942	n=1004	n=1562	n=384
WAZ-scores (mean & 95%CI)	-1.29	-1.25	-1.33	-1.37***	-1.04
HAZ-scores (mean & 95%CI)	-1.03	-0.94***	-1.1	-1.14***	-0.72
WHZ-scores (mean & 95%CI)	-0.74	-0.73	-0.76	-0.76	-0.70

[a] Anthropological measurements were missing for seven children
* p<=0.05, ** p<=0.01, *** p<=0.001 based on Pearson's chi-square test for categorical, and t-test for continuous, variables

Table 2: Indicators of child health of eight-year-olds by gender and location

Child health outcomes	Total n=954	Girl n=476	Boy n=478	Rural n=767	Urban n=187
Health outcomes reported by mother					
% perceived health worse than others	31.5	27.9*	34.9	29.5	37.2
% long-term health problems	14.3	13.8	14.9	13.6	16.6
% life-threatening illness last 3 years	10.4	9.9	11.0	11.8*	6.6
% illness in 2 weeks prior the survey	33.2	33.2	33.2	33.7	31.5
% suspected case of mental ill health (TDS scores >=17)	21.5	20.8	22.3	19.6	27.4
Nutrition outcome measured on child [a]					
WAZ-scores (mean)	-1.55	-1.46**	-1.64	-1.67***	-1.20
HAZ-scores (mean)	-1.42	-1.29***	-1.54	-1.51***	-1.15
WHZ-scores (mean)	-0.91	-0.91	-0.91	-1.01***	-0.62

[a] No missing cases
* p<=0.05, ** p<=0.01, *** p<=0.001 based on Pearson's chi-square test for categorical, and t-test for continuous, variables

Maternal social capital

The average age of the mothers of one-year-olds is 27 years, and of the eight-year olds 35 years. Ninety-eight per cent of the mothers of eight-year-olds, and 77 per cent of the mothers of one-year-olds have lived in the commune for more than five years (12 per cent of the younger mothers have lived in the commune for two years or less).

Table 3: Individual components of maternal social capital by child age group

	Mothers of 1-year-olds	Mothers of 8-year-olds	Combined
	n=1953 %	n=954 %	n=2907 %
STRUCTURAL SOCIAL CAPITAL			
Group membership			
In last year, been an active member of formal group			
Prof/trade union	7*	10	8
Co-op	5	6	5
Women's union	17***	31	22
Political/social group	1	2	1
In last year, been an active member of informal group			
Religious group	1	2	1
Credit/life insurance group	6	7	6
Sports group	0.3	0	0.2
Social support received in the last year from			
Formal networks			
Commune leaders	15	17	16
Politicians	0.1	0	0.1
Government officials	5	6	5
Non-government/charity officials	6*	9	7
Other source	7***	12	8
Informal networks			
Family/relatives	94**	91	93
Neighbours	77*	81	78
Friends (not neighbours)	71	74	72
Religious leaders	1	2	1
Citizenship activities			
Joined with other households to address a problem	30***	50	36
Talked with commune leaders about a problem in the community	4***	8	5
COGNITIVE SOCIAL CAPITAL			
In general, majority of people in commune can be trusted	83**	87	84
Majority of people in commune get along well	91*	94	92
Feel part of the commune	98**	99	98
Feel people would take advantage if they got the chance	9	7	9

* p<=0.05, ** p<=0.01, *** p<=0.001. Pearson's chi-square test is used to test for each category (dichotomous variable)

Table 3 describes the distribution of each aspect of maternal social capital, while Table 4 presents composite maternal social capital variables by child age group.

Levels of structural social capital are low, particularly among mothers of one-year-olds. While 73 per cent of mothers of one-year-olds do not participate in any group, this falls to 59 per cent among mothers of eight-year-olds (p<0.01). In addition, only 31 per cent of mothers of one-year-olds receive support from both formal and informal networks, compared to 40 per cent of mothers of eight-year-olds (p<0.01), and mothers of older children have nearly twice the level of citizenship (p<0.01). Given the communist political structures, the overall level of citizenship (collective action with community leaders) (37 per cent) is surprisingly low.

Participation in women's unions accounts for the majority of networking activities carried out by all women, though again participation is lower among the mothers of one-year-olds (17 per cent compared to 31 per cent, p<0.001). While social support from formal networks is low (35 per cent), support from informal networks such as family, friends and neighbours is very high (96 per cent, 94 per cent and 95 per cent respectively).

The face validity of measures of structural social capital appears good as statistically significant differences between the groups only appear in questions where one would expect a difference. For example, older women (mothers of eight-year-olds) are more likely to be a member of a women's union (part of the official Communist Party's mass organisations) and to have communicated with commune leaders or joined with other commune members to address an issue or problem (citizenship). This concurs with existing evidence that shows that younger generations are less likely to participate in mass organisations and other groups (Wischermann and Vinh, 2003). It may also reflect the different needs of older and younger children – the mothers of one-year-olds probably have less time to devote to networking activities.

In contrast to structural social capital, levels of cognitive social capital are very high among both groups (76 per cent and 81 per cent). Nevertheless, mothers of one-year-old children do have significantly lower levels of generalised trust, sense of social harmony and sense of belonging than mothers of eight-year-old children (p<0.01). This could be due to their lower participation rates or a lower duration of residence in a community.

The face validity of the cognitive social capital questions is good as the 'negatively' phrased question 'Do you think that most people in this commune would take advantage of you if given the opportunity' gets a low positive response of 9 per cent.

Table 4: Composite maternal social capital variables by child age group

	Mothers of 1-year-olds	Mothers of 8-year-olds	Combined
	n=1953 %	n=954 %	n=2907 %
STRUCTURAL SOCIAL CAPITAL			
Group membership			
None	73**	59	69
Formal groups	20**	33	24
Informal groups	4	4	4
Formal and informal groups	3	4	3
Any formal groups	23***	37	28
Any informal groups	7***	8	7
Any groups	27***	41	31
Social support received in the last year from			
None	3.4	3.6	3.5
Formal networks	0.6*	1.7	1
Informal networks	65	54	61
Formal and informal networks	31**	40	34
Any formal networks	32***	42	35
Any informal networks	96**	94	95
Any networks	97	96	97
Citizenship activities			
None	69	49	63
Some (either joined together or contacted leaders)	31**	51	37
COGNITIVE SOCIAL CAPITAL			
Some (< 3 'yes')	10**	6	9
Medium (=3 'yes')	14	13	13
High (=4 'yes')	76**	81	78

* p<=0.05, ** p<=0.01, *** p<=0.001. Pearson's chi-square test is used to test for each category (dichotomous variable)

Social capital does not differ by wealth groups (Table 5) but, as would be expected, the percentage of receiving no support from any network or not being active citizens is higher in rural than in urban areas, while cognitive social capital is lower in urban than in rural areas.

Table 5: Dimensions of maternal social capital by location and wealth (n=2907)

	Urban	Rural	Poorest	Very poor	Less poor	Better off
	n=573	n=2334	n=615	n=1102	n=922	n=268
STRUCTURAL SOCIAL CAPITAL						
Group membership						
None	67	69	82	69	64	61
Formal groups	23	24	13	25	28	27
Informal groups	5.7	3.1	4.2	3.1	3.2	7.8
Formal and informal groups	4.3	3.1	0.7	3.3	4.6	4.3
Any formal groups	27	27	13	28	32	31
Any informal groups	6	10	5	6	8	12
Any groups	33	31	18	31	36	39
Social support received in the last year from						
None	1.1**	4.3	4.3	3.8	3.4	0.9
Formal networks	1.3	0.8	1.3	0.8	0.7	1.7
Informal networks	53**	64	69	63	59	49
Both formal and informal networks	45	31	25	33	37	49
Any formal networks	32	46	26	33	37	50
Any informal networks	95	97	94	95	96	97
Any networks	99	96	96	96	97	99
Citizenship activities						
None	51***	67	61	65	63	55
Some (either joined together or contacted leaders)	49	33	39	35	37	45
COGNITIVE SOCIAL CAPITAL						
Some (< 3 'yes')	12	7.7	8.9	9.6	8.5	6.9
Medium (=3 'yes')	13	13	13	15	13	10
High (=4 'yes')	75*	79	78	76	78	83

* p<=0.05, ** p<=0.01, *** p<=0.001. Pearson's chi-square test is used to test for each category (dichotomous variable)

3.2 Multivariate results: the relationship between social capital and child nutrition

Associations between maternal social capital and child health outcomes vary by specific outcomes and by specific components of maternal social capital. Among the four components of maternal social capital, social support and cognitive social capital display the most statistically significant associations with child health.

Associations between maternal social capital (ie, social support and cognitive social capital) and child nutrition were apparent among one-year-olds (Table 6). Mothers of one-year-olds who receive support from either formal or informal networks have significantly better child nutritional outcomes in terms of weight-for-age (β=0.25, P<0.05) and weight-for-height (β=0.19, P=0.05) after controlling for a number of other factors. Children of mothers with high cognitive social capital have significantly higher weight-for- age (β= 0.17, P<0.01) and height-for-age indices (β= 0.18, P<0.01) than those with low cognitive social capital.

Among eight-year-olds very few consistent associations were found between maternal social capital and child nutrition. Only membership of formal organisations was significantly associated with child nutrition, with membership of formal groups associated with *worse* height-for-age z-scores (β=-0.17; 95% CI -0.3, -0.03).

Table 6: Linear regression estimates of maternal social capital components as predictors of one-year-olds' nutrition outcome measured by z-score nutritional indices (dependent variables) (n=1946)[a]

Social capital	Child nutritional outcome					
	Weight-for-age z-scores		Height-for-age z-scores		Weight-for-height z-scores	
	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]
STRUCTURAL SOCIAL CAPITAL						
Group membership						
◆ Any versus none	.04 [-.06,.15]	.02 [-.08,.12]	.07 [-.03,.18]	.02 [-.08,.12]	-.02 [-.11,.08]	.002 [-.09,.09]
◆ Any formal vs none	.05 [-.06,.17]	.04 [-.07,.15]	.05 [-.06,.17]	.008 [-.10,.12]	.007 [-.09,.11]	.03 [-.07,.13]
◆ Any informal vs none	.004 [-.17,.18]	-.03 [-.18,.12]	.10 [-.07,.29]	.02 [-.14,.19]	-.09 [-.10,.12]	-.04 [-.19,.10]
Social support received from:						
◆ Any network vs none	.41*** [.19,.64]	.25* [.04,.47]	.34** [.09,.58]	.16 [-.09,.41]	.25** [.05,.46]	.19* [-.001,.37]
◆ Any formal network vs none	.44*** [.21,.68]	.25* [-.02,.47]	.37** [.11,.64]	.15 [-.11,.41]	.26* [.05,.48]	.19 [-.006,.39]
◆ Any informal vs none	.41*** [.19,.64]	.25* [.04,.47]	.34** [.09,.59]	.17 [-.08,.42]	.26** [.04,.46]	.19 [-.003,.37]
Citizenship						
◆ Some vs none	-.02 [-.12,.08]	.02 [-.07,.12]	-.04 [-.14,.06]	-.01 [-.10,.08]	-.01 [-.10,.08]	.02 [-.06,.11]
COGNITIVE SOCIAL CAPITAL						
◆ Medium vs low	.34 [-.15,.22]	.05 [-.12,.22]	.09 [-.10,.27]	-.11 [-.06,.27]	-.02 [-.19,.15]	-.02 [-.18,.14]
◆ High vs low	.18* [.02,.33]	.17** [.03,.31]	.18** [.03,.32]	.18** [.04,.31]	.11 [-.03,.25]	.09 [-.04,.23]

a seven missing observations

b Adjusted for: (1) *Mothers*: age, education level, length of living in commune, ethnic group, occupation, mental health status; (2) *Household*: wealth index, shock events in last three years; (3) *Community*: rural/urban; (4) *Child*: sex, age

* p<=0.05; ** p<=0.01; *** p<=0.001 (compared with baseline group)

Table 7: Regression estimates of maternal social capital components as predictors of eight-year-olds' nutrition outcome measured by z-score nutritional indices (dependent variables) (n=951)[a]

Social capital	Child nutritional outcome					
	Weight-for-age z-scores		Height-for-age z-scores		Weight-for-height z-scores	
	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]	Crude b-coefficient [95%CI]	Adjusted[b] b-coefficient [95%CI]
STRUCTURAL SOCIAL CAPITAL						
Group membership						
◆ Any vs none	-.02 [-.13,.10]	-.06 [-.17,.06]	-.07 [-.20,.06]	-.14* [-.26,-.01]	.05 [-.07,.17]	.06 [-.06,.18]
◆ Any formal vs none	-.04 [-.16,.08]	-.07 [-.19,.04]	-.10 [-.24,.03]	-.17** [-.30,-.03]	.05 [-.07,.18]	-.05 [-.07,.18]
◆ Any informal vs none	.19 [-.06,.45]	-.11 [-.13,.36]	.17 [-.10,.44]	.04 [-.23,.31]	.14 [-.13,.40]	.15 [-.10,.41]
Social support received						
◆ Any vs none	.004 [-.29,.30]	-.08 [-.38,.21]	.08 [-.27,.44]	-.009 [-.37,.35]	-.08 [-.43,.26]	-.14 [-.46,.18]
◆ Any formal vs none	.01 [-.29,.31]	-.12 [-.42,.18]	.04 [-.32,.40]	-.09 [-.46,.27]	-.02 [-.37,.34]	-.10 [-.44,.23]
◆ Any informal vs none	-.001 [-.29,.29]	-.08 [-.38,.21]	.08 [-.27,.44]	-.008 [-.37,.35]	-.08 [-.43,.26]	-.14 [-.46,.18]
Citizenship						
◆ None vs some	.03 [-.08,.14]	-.02 [-.13,.09]	-.05 [-.17,.08]	.001 [-.12,.12]	.10 [-.02,.22]	-.04 [-.16,.08]
COGNITIVE SOCIAL CAPITAL						
◆ Medium vs low	.11 [-.15,.37]	.15 [-.10,.39]	.11 [-.18,.40]	.14 [-.13,.41]	.05 [-.26,.36]	.09 [-.21,.39]
◆ High vs low	.10 [-.11,.32]	.09 [-.12,.30]	.12 [-.11,.36]	.07 [-.15,.29]	.04 [-.22,.30]	.08 [-.17,.33]

a Two missing observations
b Adjusted for: (1) *Mothers*: age, education level, length of living in commune, ethnic group, occupation; (2) *Household*: wealth index, shock events in last three years; (3) *Community*: rural/urban; (4) *Child*: sex, age, mental health status
* p<0.05; ** p<0.01; *** p<0.001 (compared with baseline group)

3.3 Multivariate results: the relationship between social capital and child health

As with nutritional outcomes, social support and cognitive social capital showed the most consistent associations with child physical health outcomes among one-year-olds. Children of mothers who received social support from either formal or informal networks were stronger than children of mothers who had no social support (OR=0.31, P<0.001), and mothers who received social support from either formal or informal networks reported less life-threatening child illness compared to those with little support (OR=0.52 and 0.47 respectively; P<0.05). Children of mothers with high cognitive social capital are at a lower risk of both acute illness and long-term health problems than those from mothers with low cognitive social capital (OR=0.66, P<0.05; OR=0.52, P<0.001; and OR=0.43, P<0.01, respectively) (Table 8).

Among eight-year-olds, the most consistent associations are between good child mental health and high levels of maternal social capital, whereby except group membership, all other indicators of social capital are significantly associated with child mental health. Children of mothers with high level of cognitive social capital also have lower odds of having suffered a life-threatening illness (Table 9). The causality of this association might run either way: high trust and sense of belonging may enable a mother to seek care more effectively, or a seriously ill child may lead a mother to be more housebound and to not be able to establish trusting relationships.

3.4 Determinants of maternal social capital

As maternal social capital influences child health, it is important to know what influences maternal social capital. The determinants of social support and cognitive social capital among the mothers of one-year-olds were subsequently explored, as these variables showed the most consistent associations with child health. Understanding something of the determinants of these variables may help in designing intervention programmes to improve them.

Predictors of having social support are living in an urban area (OR=1.39 and 1.35 respectively for any formal and any informal sources of support; P<0.01 and P<0.05), having a partner who completed secondary school (OR=3.34 and 2.57 respectively for any formal and any informal; P<0.05), and good maternal mental health (Table 10). Note that ethnicity, length of residence in commune, maternal education status, maternal occupation, household wealth status, economic shocks and child's sex are not associated with having social support.

Predictors of high cognitive social capital are good maternal mental health, not working in agriculture, and living in a rural area. Note that maternal age, ethnicity, length of residence, maternal education, household wealth, household economic shocks and partner's education are not associated with cognitive social capital.

Table 8: Logistic regression estimates of maternal social capital components as predictors of one-year-olds' other health outcomes (n=1953)

Social capital	One-year-olds' health outcomes					
	Perceived health worse (yes = 1)		Long-term health problem (yes = 1)		Life-threatening since birth (yes = 1)	
	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]
STRUCTURAL SOCIAL CAPITAL						
Group membership						
◆ Any vs none	.85 [.67, 1.09]	.96 [.74, 1.24]	1.08 [.65, 1.81]	1.08 [.64, 1.82]	1.09 [.80, 1.50]	1.20 [.86, 1.68]
◆ Any formal vs none	.85 [.65, 1.11]	.97 [.74, 1.28]	1.0 [.55, 1.71]	1.0 [.55, 1.76]	1.03 [.74, 1.45]	1.12 [.78, 1.61]
◆ Any informal vs none	.87 [.56, 1.34]	.91 [.58, 1.43]	1.34 [.62, 2.9]	1.26 [.57, 2.78]	1.34 [.79, 2.29]	1.59 [.92, 2.74]
Social support received						
◆ Any vs none	.33*** [.20, .55]	.32*** [.18, .54]	.59 [.19, 1.80]	.43 [.14, 1.31]	.43** [.24, .78]	.47* [.25, .88]
◆ Any formal vs none	.32*** [.19, .55]	.31*** [.18, .55]	.59 [.18, 1.9]	.40 [.13, 1.30]	.46* [.25, .86]	.52* [.28, 1.00]
◆ Any informal vs none	.33*** [.20, .55]	.31*** [.18, .54]	.60 [.19, 1.8]	.44 [.14, 1.33]	.43** [.24, .78]	.47* [.25, .88]
Citizenship						
◆ None vs some	.93 [.74, 1.17]	.84 [.66, 1.08]	.80 [.47, 1.38]	.78 [.45, 1.36]	.99 [.73, 1.34]	.91 [.65, 1.26]
COGNITIVE SOCIAL CAPITAL						
◆ Medium vs low	.80 [.53, 1.22]	.89 [.57, 1.37]	.72 [.32, 1.59]	.71 [.32, 1.59]	1.11 [.64, 1.94]	1.12 [.61, 2.06]
◆ High vs low	.61*** [.43, .87]	.66* [.46, .95]	.42** [.22, .80]	.43** [.22, .82]	.77 [.49, 1.22]	.80 [.49, 1.31]

Table 8 continued…

| Social capital | One-year-olds' health outcomes | | | |
| | Injury/accident since birth (yes = 1) | | Illness in last 24 hours (yes = 1) | |
	Crude odds ratio [95%CI]	Adjusted a odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted a odds ratio [95%CI]
STRUCTURAL SOCIAL CAPITAL				
Group membership				
◆ Any vs none	1.11 [.76, 1.61]	1.17 [.80, 1.71]	1.04 [.79, 1.38]	1.11 [.83, 1.48]
◆ Any formal vs none	1.14 [.77, 1.68]	1.23 [.82, 1.85]	1.07 [.80, 1.44]	1.14 [.84 , 1.56]
◆ Any informal vs none	1.04 [.54, 1.98]	1.04 [.54, 1.99]	.96 [.58, 1.59]	1.04 [.62, 1.74]
Social support received				
◆ Any vs none	.93 [.40, 2.13]	.92 [.38, 2.19]	.65 [.36, 1.17]	.61 [.33, 1.11]
◆ Any formal vs none	.83 [.35, 2.0]	.84 [.34, 2.11]	.62 [.33, 1.17]	.59 [.31, 1.12]
◆ Any informal vs none	.93 [.40, 2.14]	.93 [.39, 2.21]	.65 [.36, 1.17]	.61 [.33, 1.11]
Citizenship				
◆ None vs some	.77 [.53, 1.12]	.74 [.50, 1.10]	.90 [.68, 1.19]	.88 [.67, 1.17]
COGNITIVE SOCIAL CAPITAL				
◆ Medium vs low	.71 [.38, 1.32]	.75 [.40, 1.41]	.95 [.60, 1.50]	1.00 [.63, 1.59]
◆ High vs low	.58* [.35, .96]	.62 [.37, 1.05]	.49*** [.33, .71]	.52*** [.35, .77]

[a] Adjusted for: (1) *Mothers*: age, education level, length of living in commune, ethnic group, occupation, mental health status; (2) *Household*: wealth index, shock events in last three years; (3) *Community*: rural/urban; (4) *Child*: sex, age

* P<0.05; ** p<0.01; *** p<0.001 (compared with baseline group)

Table 9: Logistic regression estimates of maternal social capital components as predictors of eight-year-olds' other health outcomes (n=954)

Social capital	Eight-year-olds' health outcomes					
	Perceived health worse (yes = 1)		Long-term health problems (yes = 1)		Life-threatening illness last 3 yrs (yes = 1)	
	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted [a] odds ratio [95%CI]
STRUCTURAL SOCIAL CAPITAL						
Group membership						
◆ Any vs none	.93 [.69, 1.26]	1.06 [.77, 1.47]	1.13 [.77, 1.67]	1.17 [.77, 1.77]	1.06 [.68, 1.63]	1.32 [.83, 2.10]
◆ Any formal vs none	.93 [.68, 1.27]	1.10 [.78, 1.54]	.98 [.65, 1.48]	1.00 [.65, 1.54]	1.05 [.67, 1.65]	1.33 [.82, 2.16]
◆ Any informal vs none	1.08 [.63, 1.88]	1.05 [.61, 1.81]	2.0* [1.07, 3.74]	1.88 [.95, 3.70]	1.24 [.57, 2.69]	1.48 [.65, 3.35]
Social support received						
◆ Any vs none	.86 [.41, 1.78]	.77 [.36, 1.64]	.83 [.33, 2.10]	.78 [.31, 1.96]	.66 [.24, 1.78]	.61 [.22, 1.64]
◆ Any formal vs none	.73 [.34, 1.55]	.65 [.30, 1.42]	.87 [.34, 2.26]	.83 [.31, 2.19]	.70 [.25, 1.95]	.71 [.25, 2.0]
◆ Any informal vs none	.86 [.41, 1.77]	.77 [.36, 1.63]	.82 [.33, 2.08]	.77 [.30, 1.84]	.64 [.24, 1.75]	.59 [.22, 1.58]
Citizenship						
◆ None vs some	1.06 [.79, 1.42]	.94 [.68, 1.30]	.82 [.56, 1.21]	.76 [.50, 1.15]	1.23 [.80, 1.90]	1.22 [.79, 1.90]
COGNITIVE SOCIAL CAPITAL						
◆ Medium vs low	.56 [.29, 1.10]	.64 [.31, 1.31]	.54 [.24, 1.22]	.55 [.23, 1.28]	.18*** [.07, .47]	.18*** [.07, .47]
◆ High vs low	.45*** [.25, .78]	.57 [.32, 1.05]	.44* [.23, .86]	.50 [.24, 1.00]	.30*** [.15, .59]	.32*** [.16, .64]

Table 9 continued…

Social capital	Eight-year-olds' health outcomes			
	Illness in last two weeks (yes = 1)		Mental health scores >=17 (yes = 1)	
	Crude odds ratio [95%CI]	Adjusted a odds ratio [95%CI]	Crude odds ratio [95%CI]	Adjusted a odds ratio [95%CI]
STRUCTURAL SOCIAL CAPITAL				
Group membership				
◆ Any vs none	.97 [.73, 1.30]	1.08 [.80, 1.48]	1.19 [.85, 1.66]	1.29 [.90, 1.85]
◆ Any formal vs none	1.0 [.73, 1.33]	1.14 [.82, 1.58]	1.19 [.84, 1.68]	1.37 [.95, 2.0]
◆ Any informal vs none	.86 [.73, 1.37]	.80 [.45, 1.40]	1.56 [.88, 2.79]	1.28 [.68, 2.10]
Social support received				
◆ Any vs none	1.75 [.75, 4.08]	1.78 [.75, 4.25]	.61 [.28, 1.35]	.40* [.18, .89]
◆ Any formal vs none	1.53 [.64, 3.63]	1.62 [.67, 3.95]	.55 [.24, 1.24]	.34* [.15, .80]
◆ Any informal vs none	1.75 [.75, 4.07]	1.77 [.74, 4.12]	.61 [.28, 1.35]	.40* [.18, .89]
Citizenship				
◆ Some vs none	1.23 [.92, 1.64]	1.36 [1.0, 1.86]	.69* [.49, .96]	.64* [.44, .92]
COGNITIVE SOCIAL CAPITAL				
◆ Medium vs low	.83 [.43, 1.60]	.99 [.49, 1.98]	.86 [.43, 1.73]	1.15 [.54, 2.42]
◆ High vs low	.48** [.27, .83]	.58 [.32, 1.06]	.39* [.22, .72]	.45* [.24, .85]

a Adjusted for: (1) *Mothers*: age, education level, length of living in commune, ethnic group, occupation, mental health status; (2) *Household*: wealth index, shock events in last three years; (3) *Community*: rural/urban; (4) *Child*: sex, age
* p<0.05; ** p<0.01; *** p<0.001 (compared with baseline group)

Table 10: Logistic regression estimates of predictors of maternal structural social capital (social support) of mothers of one-year-olds

Factors	Structural social capital: Received support from					
	Any vs None[a]		Any formal vs None[b]		Any informal vs None[b]	
	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]
MOTHER						
Age (in years)	1.00 [.95, 1.04]	.98 [.94, 1.03]	1.02 [1.00, 1.08]	1.00 [.95, 1.05]	1.00 [.95, 1.04]	.98 [.94, 1.03]
Length of living in commune (in years)	1.00 [.97, 1.01]	1.00 [.97, 1.02]	1.00 [.97, 1.01]	1.00 [.97, 1.02]	1.00 [.97, 1.01]	1.00 [.97, 1.02]
Ethnicity (0 = others; 1 = kinh)	2.01* [1.13, 3.58]	1.15 [.60, 2.23]	2.10* [1.14, 3.88]	.93 [.46, 1.90]	2.02* [1.14, 3.61]	1.17 [.60, 2.56]
Education level						
◆ Primary vs no schooling	1.80 [.97, 3.29]	1.42 [.71, 2.85]	1.50 [.80, 2.82]	1.14 [.55, 2.37]	1.80 [1.00, 3.29]	1.42 [.71, 2.84]
◆ Secondary vs no schooling	1.77 [.96, 3.27]	1.03 [.45, 2.39]	2.42** [1.28, 4.57]	1.24 [.52, 2.95]	1.77 [.96, 3.25]	1.03 [.44, 2.38]
Occupation (0 = other; 1 = agriculture)	.56* [.34, .94]	.75 [.41, 1.39]	.49** [.29, .83]	.73 [.39, 1.37]	.56* [.34, .94]	.75 [.41, 1.38]
Mental health status (0 = no; 1 = yes)	.50* [.29, .86]	.41** [.23, .72]	.57 [.33, 1.02]	.47** [.26, .85]	.50* [.29, .85]	.40** [.23, .72]
HOUSEHOLD						
Wealth index <0.5 (0 = no; 1 = yes)	1.61 [.94, 2.75]	.67 [.31, 1.46]	2.11** [1.21, 3.67]	1.75 [.34, 1.67]	1.61 [.94, 2.76]	.67 [.31, 1.46]
Shock events happened in last three years						
◆ 1 event vs none	1.32 [.71, 2.44]	1.53 [.78, 3.00]	1.30 [.69, 2.45]	1.50 [.75, 3.00]	1.33 [.72, 2.45]	1.55 [.79, 3.04]
◆ >=2 events vs none	1.04 [.50, 2.14]	1.55 [.73, 3.30]	1.32 [.63, 2.77]	2.06 [.95, 4.50]	1.03 [.50, 2.13]	1.55 [.73, 3.30]

Structural social capital: Received support from

Factors	Any vs None[a]		Any formal vs None[b]		Any informal vs None[b]	
	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]
Living area (0 = rural; 1 = urban)	1.36* [1.07, 1.74]	1.35* [1.04, 1.74]	1.47** [1.15, 1.87]	1.39** [1.07, 1.81]	1.36* [1.07, 1.74]	1.35* [1.04, 1.75]
CHILD						
Child's sex (0 = girl; 1 = boy)	1.33 [.80, 2.21]	1.45 [.86, 2.44]	1.30 [.77, 2.21]	1.46 [.85, 2.51]	1.34 [.81, 2.23]	1.46 [.87, 2.46]
Age (in months)	.96 [.88, 1.05]	.95 [.87, 1.04]	.96 [.88, 1.05]	.95 [.86, 1.04]	.96 [.88, 1.05]	.95 [.87, 1.04]
HUSBAND						
Partner's education						
◆ Primary vs no schooling	1.39 [.76, 2.53]	1.21 [.62, 2.34]	1.47 [.77, 2.79]	1.36 [.67, 2.74]	1.39 [.76, 2.54]	1.21 [.62, 2.34]
◆ Secondary vs no schooling	2.88*** [1.53, 5.43]	2.59* [1.23, 5.44]	4.22*** [2.17, 8.20]	3.34* [1.53, 7.27]	2.87*** [1.52, 5.41]	2.57* [1.22, 5.40]

a logistic model *(base category = none or not receiving any support from individual as well as group network)*, b Multinomial logistic model *(base category = not receiving any support)*

1 n = 1953; 2 n = 1926 (27 missing observations)

* p<0.05; ** p<0.01; *** p<0.001 (compared with baseline group)

Table 11: Logistic regression estimates of predictors of maternal cognitive social capital of mothers of one-year-olds

Factors	Cognitive social capital[b]			
	Medium vs low		High vs low	
	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]	Crude[1] odds ratio [95%CI]	Adjusted[2] odds ratio [95%CI]
MOTHER				
Age (in years)	1.03 [1.00, 1.07]	1.03 [1.00, 1.08]	1.02 [.99, 1.05]	1.03 [.99, 1.06]
Length of living in commune (in years)	1.02 [1.00, 1.03]	1.00 [.99, 1.03]	1.02* [1.00, 1.03]	1.00 [.99, 1.02]
Ethnicity (0 = others; 1 = kinh)	.83 [.46, 1.48]	.69 [.34, 1.40]	.76 [.47, 1.23]	.69 [.38, 1.23]
Education level				
◆ Primary vs no schooling	.97 [.59, 1.60]	.95 [.53, 1.71]	.95 [.64, 1.41]	.89 [.55, 1.42]
◆ Secondary vs no schooling	1.41 [.84, 2.35]	1.21 [.61, 2.40]	1.08 [.71, 1.64]	.89 [.51, 1.56]
Occupation (0 = other; 1 = agriculture)	1.15 [.77, 1.70]	1.04 [.66, 1.64]	.86 [.62, 1.17]	.67* [.46, .99]
Mental health status (0 = no; 1 = yes)	.62 [.41, .96]	.66 [.42, 1.04]	.34*** [.24, .48]	.38*** [.27, .55]
HOUSEHOLD				
Wealth index <0.5 (0 = no; 1 = yes)	1.09 [.72, 1.64]	1.22 [.69, 2.13]	1.17 [.84, 1.64]	1.43 [.89, 2.29]
Shock events happened in last three years				
◆ 1 event vs none	.79 [.50, 1.24]	.83 [.51, 1.35]	.74 [.51, 1.08]	.85 [.57, 1.27]
◆ >=2 events vs none	.85 [.49, 1.46]	.94 [.53, 1.67]	.73 [.47, 1.13]	.91 [.57, 1.45]
Living area (0 = rural; 1= urban)	.92 [.82, 1.03]	.87 [.75, 1.01]	0.90* [.82, .99]	0.81** [.72 , .93]
CHILD				
Child's sex (0 = girl; 1=boy)	1.35 [.90, 2.00]	1.35 [.90, 2.04]	1.25 [.90, 1.73]	1.29 [.92, 1.80]
Age (in months)	1.00 [.94, 1.07]	1.00 [.94, 1.08]	.99 [.94, 1.04]	.99 [.94, 1.05]
HUSBAND				
Partner's education				
◆ Primary vs no schooling	1.19 [.69, 2.07]	1.34 [.75, 2.39]	.98 [.64, 1.51]	1.09 [.68, 1.75]
◆ Secondary vs no schooling	1.45 [.87, 2.43]	1.43 [.76, 2.70]	1.12 [.75, 1.67]	1.18 [.70, 1.99]

[a] Multinomial logistic model *(base category = low level)*
[1] n = 1953; [2] n = 1926 (27 missing observations)
* p<0.05; ** p<0.01; *** p<0.001 (compared with baseline group)

4. Discussion and conclusions

As with all cross-sectional studies, causality cannot be attributed to the associations found in this paper. In addition, the over-sampling of poor respondents for the Young Lives study, and the measurement of only maternal social capital, means that these results cannot be generalised to the population of Vietnam as a whole.

This study only measures the social capital of a child's mother. However, children are likely to be influenced by the social capital of other members of the household, and indeed a composite measure of 'household social capital' may show stronger associations with child health. The place of women in society may affect access to social capital, for example by being a member of fewer formal organisations or social groups than men. In addition, some measurement of the child's social capital, particularly of the eight-year-olds, may help to explain some aspects of child health.

Four main conclusions can be drawn from this study. Firstly, maternal social support and high cognitive social capital show the most consistent associations with child health. The fact that these variables relate to a more nurturing environment in which the child develops may explain the importance of these variables for child health.

Secondly, associations between maternal social capital and child health are much stronger among one-year-old children than among eight-year-olds, with the exception of child mental health and life-threatening illness. We hypothesise that this is because infants have much greater contact with their mother, and are therefore influenced by the social world in which she moves to a greater extent. Perhaps by the age of eight, children have begun to develop their own social capital, though their emotional development may still be influenced by the social capital of their mother.

Thirdly, the most consistent associations are seen with the mental health of eight-year-olds, with three of the four indicators of social capital being significantly associated with mental health after other variables have been controlled for. Other studies have shown social capital to be more consistently associated with mental rather than physical health (De Silva et al, 2005); the quality of the social environment is perhaps expressed more readily through emotional than through physical health.

Lastly, there is some evidence to suggest that active membership of formal organisations in Vietnam may be damaging to the health of eight-year-olds but not one-year-olds. Active participation in formal groups was significantly associated with an increase in stunting among eight-year-olds. With this cross-sectional data it is not possible to determine whether the costs imposed on mothers participating in formal groups lead to child stunting, or whether mothers with a stunted child are more willing to participate in formal groups in order to receive social support from those groups, though this can be explored in future rounds of the Young Lives project. However, one previous study did find a negative impact of membership of groups on mental health, indicating the potentially damaging side to group membership (Mitchell and La Gory, 2002). Group membership can damage mental health by being an extra burden on top of the productive and reproductive roles of women and/or it can produce stigma and peer pressure, which increase stressors upon a woman. This hypothesis could be usefully explored by qualitative research which takes cases of mothers with high levels of participation who have

malnourished children. The mothers' perceptions of participation as a burden/chore versus a positive opportunity could be examined.

Structural social capital is remarkably low in a context where mass organisations still exist. The only other quantitative study of social capital in Vietnam found higher levels of structural social capital but it included men in its sample. However, when analysing *active* membership of groups (as was done in this study) a general 'social disconnectedness' was found (Dalton and Ong, 2001). Though women's unions remain an important formal network in Vietnam with approximately 20 per cent of mothers active members, other types of informal and formal groups have a much smaller influence, in particular informal organisations such as religious and sports groups. The only association found in this study between active membership of groups and child health was with nutritional status of eight-year-olds measured by height-for-age z-scores, but this statistical correlation has less practical implications.

A positive association between social support from informal networks and the nutrition status of one-year-old children (weight-for-age) was found. These networks comprise family, friends and neighbours and are a strong feature of Vietnamese society, with 96 per cent of mothers receiving support from this source. For 65 per cent of mothers, this constitutes their only source of support. Confucian traditions often promote trust in a relatively narrow realm of family and the Vietnamese family has been characterised as 'residentially nuclear but functionally extended' (Jones, 1995 p.189), with extensive support offered by the family (Pham, 1999). Dalton et al (2002) hypothesise that development in Vietnam will not diminish traditional family networks but add work and friendship networks to them: 'further development in Vietnam is not so likely to exchange one set of social networks for another, but to expand the number and activity levels of the networks that connect individuals to society, and which help form their social and political identities' (p.4). Only longitudinal research will be able to address this hypothesis and Young Lives is well placed to do so.

Some previous studies have shown levels of adults' generalised trust to be generally low in developing countries (Productivity Commission, 2003). Indeed, preliminary results from Peru, one of the other countries taking part in the Young Lives study, show levels of maternal generalised trust in the community to be only 30 per cent (www.younglives.org.uk). In contrast, Vietnam has extremely high levels of trust, with 84 per cent of mothers believing that people in general can be trusted. This is echoed in the high levels of the other indicators of cognitive social capital: sense of community harmony, sense of belonging, and perceived fairness. Dalton and Ong (in press), using similar questions, also found high levels of trust in Vietnam – higher than in China and the world average. High maternal cognitive social capital is associated with better child health in terms of nutrition status and physical health among one-year-olds, and in physical and mental health among eight-year-olds.

As this is only the second study to consider social capital in Vietnam, and the first to study maternal social capital and child well-being, any attempt to identify policy implications must be considered exploratory. In addition, this study was not able to assess the relative importance of maternal social capital as a risk factor for child health as it does not include all potential risk factors for child health. For example, the relative importance of maternal social capital as a risk factor for child malnutrition cannot be analysed because we were unable to include all possible risk factors for malnutrition in the models (for example, Young Lives does not measure food availability). As this study has established that aspects of maternal social capital are associated with some child health outcomes, additional studies

are needed to assess its importance relative to other known risk factors for child health (for example poverty) and therefore its policy importance. However, raising structural social capital (but ensuring this does not create damaging burdens to women) and maintaining the high levels of cognitive social capital is obviously a general policy priority. Strengthening social capital in Vietnam can be envisaged in two (mutually supporting) scenarios. Firstly, in a formalising scenario it is recognised that traditional social dynamics are changing (through urbanisation, reduction of extended family and ageing population) and that formal structures, eg, mass and non-governmental organisations and community-based organisations (CBOs), will need to step in to facilitate social networks and support. Though their roles have been increasingly recognised by the government and in the public discourse, the development of these organisations is, however, constrained by an unsupportive legal environment. A government decree in 2003 (88/2003 NC-CP) with regards to the organisation and management of people's associations in Vietnam gives a positive signal. However, it fails to give clear operational guidelines, which should be a priority for policy debate and formulation. In addition, given a clear role of engaging in social mobilisation work and securing benefits for their own members, mass organisations could perform their role better by transforming themselves in order to adapt to social changes. This can be done, and is being done in some mass organisations, by going beyond mobilising support for the central Communist Party to meeting the needs of, and advocating on behalf of, their membership. For example, they need to diversify their activities in such a way that could interest, and meet the various needs of, their members. An example of the women's union's diversification of activities is that the meeting of women's union groups should not focus only on discussing their own procedural activities but also integrate other activities (such as life skills training, family planning, HIV/AIDS, business planning, etc) and capacity-building for their local staff in order to handle their new role.

Secondly, an informalising scenario envisages new individual connections and support arising from the new social structures. Strategies to respond to this scenario require actions aimed at supporting informal structures rather than formal institutions. In Vietnam, there is a supportive policy environment for individuals to strengthen their informal social capital and general citizenship. The introduction of 'Decree 29'[3] and its recent revision that was built on a principle of 'people know, people discuss, people manage, and people supervise' indicates government support in individual capacity-building and facilitating local people's participation in decision-making. According to the decree, people are encouraged to discuss and make decisions on issues that concern or affect them. In addition, they are encouraged to provide feedback on decisions made by related stakeholders and higher authorities. The role of CBOs/people's organisations would fit well in this context as they could facilitate local people to speak for themselves, or link people with higher-level authorities. One of the biggest challenges in implementing the decree is the lack of practical guidance and the disincentive of loss of power for local civil servants (World Bank and ADB, 2002).

This first quantitative study of maternal social capital in Vietnam has shown it to be associated with some aspects of child health. Policy debate on strengthening social relations in a dynamic context needs to be informed by this data and by future rounds of the Young Lives study that will produce data capable of exploring causal relationships as well as the changing social situation.

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3   This decree aims to strengthen the participation of grassroots people in local planning and decision-making.

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In Vietnam there is growing concern about the potential social impact of rapid economic changes. The extent and type of social connectedness, or social capital, may be changing. Studies from other developing countries have demonstrated that social capital is often independently associated with various indicators of well-being, including some aspects of human capital (health and education status). In Vietnam there has only been one previous quantitative study of social capital and this did not consider associations with well-being. The Young Lives project in Vietnam allows the examination of the relationship between maternal social capital and child well-being. With a sample of 1,953 mothers of one-year-olds and 954 mothers of eight-year-olds across five provinces, this study examines whether maternal social capital is associated with child health.

This study found low levels of structural social capital (associational life) and citizenship and high levels of cognitive social capital (trust, etc) and support. While poorer women have even lower levels of structural social capital than their better-off peers, patterns across rural and urban areas are similar.

Maternal social support and high cognitive social capital show the most consistent associations with child health, while associations between maternal social capital and child health are stronger among one-year-old children than among eight-year-olds, with the exception of child mental health and risk of life-threatening illness. The most consistent associations were seen with the mental health of eight-year-olds, with all four indicators of social capital being significantly associated with mental health after other variables have been controlled for. Lastly, there was some evidence to suggest that active membership of formal organisations in Vietnam may be damaging to the health of eight-year-olds but not one-year-olds, with active participation in formal groups being significantly associated with an increase in stunting among eight-year-olds.

The main components of social capital associated with child health are social support and cognitive social capital. High levels of maternal social support are positively correlated with having an educated partner, living in an urban area and better maternal mental health. High cognitive social capital is positively correlated with living in a rural area, having an occupation other than agriculture and better maternal mental health.

There is a need to focus on maintaining the high levels of cognitive social capital and raising the current low level of maternal structural social capital in Vietnam.

Key words: social capital, child health, Vietnam, quantitative