Social capital and health in Indonesia

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Abstract

This paper examines the empirical relationship between community social capital and individual health, focusing on health measures both relating to physical as well as mental health. In addition to examining the relationship between social capital and health, we examine the evidence for interrelationships between social and human capital in the production of health. We use data on more than 10,000 adults from the Indonesian Family Life Surveys of 1993 and 1997. We find a robust positive association between community-level social capital and good health. We find weak evidence for some of the health measures examined for an interrelationship between human and social capital and mental health.

1. Introduction

In this paper we examine the empirical relationship between community-level social capital and an individual's health, focusing on Indonesia in the mid 1990's. We are especially interested in comparing on the one hand the relationship between social capital and health, and on the other hand the relationship between human capital and health. In addition, we examine the empirical evidence for interrelationships between social and human capital in the production of health. We focus on measures relating both to physical and mental health.

Why might social capital be related to health and mental health? There is an extensive literature on the relationship between social capital and economic development, represented in the collection of papers in Dasgupta and Serageldin (2000) and the World Bank's social capital web page (n.d. 1). Traditionally, greater income, better education, and the products of physical, financial and human capital through economic growth have been credited with leading to improvements in health (Coleman and Rose, 2000; Dasgupta and Serageldin, 2000). A growing body of literature points to social capital as a major factor in physical and mental health. For reviews of this literature and extensive discussion, see Cullen and Whiteford (2001), and the World Bank's social capital and health web page (n.d. 2).

However, because the study of social capital and health is still at an early stage, there is a need for work documenting what empirical relationship may exist. In this paper we construct a community-level social capital index, based on the number of categories of organizations present in a community, and use this as a proxy for social capital. While this index is but one choice of possible measures of social capital, it serves as a useful first step in exploring the relationship between social and human capital and health.

In this paper we use data on more than 10,000 adults from the Indonesian Family Life Surveys of 1993 and 1997, and examine a number of measures of mental and physical health. We do not examine closely the mechanisms by which community social capital might influence an individual's mental and physical health. Instead, this paper focuses on a more basic issue: is there an association between social capital and mental (and physical) health? We ask the following questions: is the level of mental health of individuals living in communities with high levels of social capital greater than that of individuals living in communities with low levels of social capital, after controlling for individual covariates such as age and education? Further, does the relationship between human capital and mental health vary according to (that is, interact with) the level of social capital? This allows for empirical exploration of the interrelationship between human capital and social capital. While we do not interpret our estimated relationships as causal, they may help to guide thinking about the underlying causal relationships and suggest new avenues for research.

The main finding is that community-level social capital is positively associated with an individual's good health. This is true for a range of mental and physical health measures. This relationship is robust to controlling for a wide variety of individual and community-level characteristics. For example, an increase by one standard deviation (measured at the village level) in social capital is associated with a decreased propensity to report feeling sad of 2 percentage points, a 14% decline from the mean level. Weak evidence for a relationship between human capital and mental health is indicated by some of the measures used in this paper.

The rest of the paper proceeds as follows. Section 2 discusses our empirical specification. Section 3 presents our dataset and sample selection, and discusses the descriptive statistics of the dataset. Section 4 presents results for our mental health models, and Section 5 presents results for

the physical health models. Section 6 examines the interaction between human and social capital. Section 7 explores the robustness of our results. We conclude in Section 8.

2. Specification

A health production function motivates the empirical model that we use, which is a static analogue to Grossman (1972). In this setting, the health for individual i who lives in community c is represented by h_{ic}, where h_{ic} might be an indicator for experiencing a type of mental health difficulty such as sadness, anxiety, or trouble sleeping. Alternatively, h_{ic} could represent a measure of physical health such as the number of activities of daily living that the respondent reports being able to perform easily. Our empirical model of health can be represented by the following estimation equation:

$$h_{ic} = \alpha_0 + \alpha_1 age_{ic} + \alpha_2 ED1_{ic} + \alpha_3 ED2_{ic} + \beta_1 SC_c + \beta_{21} Z_c + \varepsilon_{ic}$$

Where:

h_{ic}	Health variable for person i in community c.
age_{ic}	Age of person i in community c.
$ED1_{ic}$	Indicator for education level less than primary level.
$ED2_{ic}$	Indicator for education level more than primary level.
SC_c	Our community-level social capital variable: the number of types of active community-level organizations (out of a possible 11).
Z_c	Other community-level variables.

This specification is motivated largely from Figure 1, which illustrates the basic model behind the relationship between human and social capital and health, and their interactions. Figure 1 illustrates the notion that both human capital and social capital may be inputs to health. Further, our model allows for an interaction effect between the two in the production of health. Our

primary specification (above) focuses on the direct relationships between human and social capital and health. We consider possible interactions in Section 6.

For measures of human capital we use the individual's education. We include indicator variables for whether a person has more than an elementary education, or less than an elementary education (with graduation from elementary education being the omitted category). For measures of social capital, we construct a measure of the number of categories of community organizations that have an active group. Measures of health outcomes, as discussed above, are used as dependent variables.

In this specification, the coefficients on education and community organizations are interpreted as health returns on human and social capital. In a typical wage regression, education is included as a right hand side variable, and the estimated coefficient is interpreted as the wage return to human capital. This is analogous to the income returns on financial capital. In a similar fashion, this paper interprets the coefficient on education as a health return to human capital. Similarly, the coefficient on the social capital proxy variable is interpreted to be the (mental) health return to social capital.

It is important to note that several biases may be present in this analysis. The ability to interpret the estimated coefficients as unbiased estimates of the return to human and social capital depends on the assumption that the error term ε_{ic} is uncorrelated with the right hand side variables. This assumption is violated if there are unobserved factors which influence (or are correlated with) health, and which are also correlated with our right hand side variables. If there are such unobserved factors, the estimated coefficients will be biased. We address this problem by including a wide range of control variables in our specifications. It must be stressed however that our estimates still should be interpreted with caution.

The specification listed above does not allow for the interactions presented in Figure 1. In addition to estimating that equation, we also estimate a specification that allows for such interactions, which can be tested for their significance. We estimate the following equation:

$$h_{ic} = a_0 + a_1 age_{ic} + a_2 ED1_{ic} + a_3 ED2_{ic} + b_1 SC_c + d_1 ED1_{ic} * SC_c + d_2 ED2_{ic} * SC_c + b_{21} Z_c + e_{ic}$$

In this way we test for the importance of the interaction effects by examining the sign and statistical significance of the coefficients δ_1 and δ_2.

3. Data and Sample Selection

The data we use come from the first two waves of the Indonesian Family Life Survey (IFLS1 and IFLS2), from the years 1993 and 1997 (Frankenberg and Karoly, 1995, Frankenberg and Thomas). This survey is a large longitudinal household-level survey representative of 13 of Indonesia's 27 provinces, covering 83% of its population. The IFLS collects information about demographics, education, and health, as well as community-level information.

The survey has two waves that we focus on: 1993 (IFLS1) and 1997 (IFLS2). Our individual-level data come from the 1993 wave. The IFLS1 survey has responses to mental health related questions for 12,985 individuals, about 90% of adults surveyed. This information is self-reported levels of sadness, anxiety, and insomnia, fatigue or exhaustion, short-tempered or hypersensitive, bodily pains, sadness, and anxiety/fear during the previous 4 weeks. In addition, we have information on the individual's overall self-reported health status, as well as their ability to perform a number of basic activities of daily living.

The 1997 wave contains several questions that can provide measures of social capital. These questions relate to the density of local civic organizations. The dataset has a list of

programs, and information is collected on whether or not each program exists in the community. These programs include: Save and Borrow Group; Cooperative; "Pharmacy" garden; Family planning acceptors' group; Child development group; Adolescents' group; Senior citizens' group; Youth group; Health fund; "MCH health group"; and "10 HH program". For a discussion of Family planning groups in Indonesia, see Shiffman (2002).

We merge information from the two waves to make one cross-section for analysis. We take the community organization information from the IFLS2 wave and create several community-level variables. We then match these communities to the individuals in the IFLS1 wave, and assign the community-level characteristics to them. While we would prefer to use contemporaneous individual- and community-level information, we are unable to do so, as there are no mental health questions in IFLS2 and no social capital questions in IFLS1.

This analysis is focused on a cross section of individuals aged 26 and older. The sample is restricted to those individuals with non-missing data on the demographic, socioeconomic status (SES), and health variables, and who can be matched to a community for the purpose of looking at community-level correlates. This yields a sample of 10971 individuals in 306 communities.

Table 1 presents summary statistics of the health variables. The first four variables present questions related to overall health, or to physical health. The first asks whether a person has experienced fatigue within the past four weeks. 27% of respondents have done so. One out of five individuals reported experiencing bodily pain within the past four weeks. Individuals are asked to report their overall health, with allowable responses being "very healthy," "somewhat healthy", "somewhat unhealthy," and very unhealthy." We code these responses from 1 (very healthy) to 4 (very unhealthy). The mean response to the self-reported health status question is 1.96, corresponding to a response of "somewhat healthy." Indeed, this is the modal response to this

question. The final variable is the number of activities of daily living that the respondent reports being able to do "easily." The categories for the activities are: to carry a heavy load (like a pail of water) for 20 meters; to sweep the house floor or yard; to walk for 5 kilometers; to draw a pail of water from a well; to bow, squat, keel; to dress without help; to stand up from a sitting position in a chair without help; to go to the bathroom without help; and to stand up from sitting on the floor without help. The mean value is 8.55 (out of 9).

The next four variables in Table 1 are the variables that are related to mental health. They are each indicators for whether an individual has experienced a "symptom" within the four weeks prior to the interview. The four symptoms are sadness, anxiety, insomnia, and short temper. These questions are loosely modeled after the mental health component of the RAND SF-36, a survey instrument that has been shown to be useful in screening for mental disorders in the US (Ware and Gandek, 1998, 907). The mental health questions asked in the IFLS (and the answers allowed for) are more limited than those in the SF-36. (We thank Cathy Sherbourne of RAND for a useful discussion of the RAND SF-36) It also appears that neither the SF-36 nor the mental health questions in the IFLS survey have been validated in the Indonesian population. However, these responses can provide some indication to the mental well being of the respondents. Further, given the paucity of evidence on correlates of mental health within Indonesia, the work here can be seen as an early contribution to such a body of evidence.

Those who report feeling sadness are 14% of the population. Six percent of respondents report feeling anxiety. Twenty one percent report having trouble sleeping, and 14% report having a short temper. Outside sources to corroborate these numbers have been searched for extensively and none have been found with comparable questions. As such, these results may be the first such data on these types of self-reported experiences (sadness, anxiety, etc.) for Indonesia.

Table 2 presents summary statistics of the demographic and socioeconomic variables. The mean age for individuals in our sample is 45, and slightly more than one third are older than 50, with about one sixth older than age 60. Slightly more than half of the members of the sample are women. Approximately one quarter has not finished elementary school, and 20% have completed more than elementary school. The remaining 54% have finished elementary education, but not beyond. Approximately two thirds of the sample is working, either in the formal or informal sector. The average household per capita monthly expenditure is about US$33/month, based on an exchange rate of 2105 Rupiah/US$.

Table 3 reports means of the community-level variables. These are simple averages over the 303 communities, without weighing by the community size. It should be noted that the community-level variables come from the IFLS 2 survey and, as such, represent values as of 1997. Slightly more than half of the communities in the IFLS are urban. The mean population is 11,361 residents. About one in five have received "underdeveloped village" funds from the central government. The average village level of household per capita expenditure is US$39/month. Of the eleven possible types of community organizations, the average community has 5.32 active.

4. General Health Variables

Table 4 considers four general health variables. For each of the specifications, the same explanatory variables are used. We include the social capital variable as well as several other control variables at the individual and community-level. Individual-level controls include age (allowing the slope to change at ages 50 and 60), sex, education, employment status, and household per capita expenditure. The education controls are indicator variables for less than elementary

education and greater than elementary education (with exactly elementary education as the omitted group).

Community-level controls include social capital, community per capita expenditure, community receipt of underdeveloped village funds, community population, and urban status. The community per capita expenditure variable is calculated for each household as the mean expenditure over all other households in the community. This is done to avoid spurious correlations between own household expenditure and mean household expenditure. (If own household expenditure were included in the computation of the community mean, there would be a mechanical relationship between the two.) An indicator is included for whether the village has received (by 1997) "underdeveloped village" funds from the central government. These two variables serve to proxy for the general degree of wealth in a community. In addition to controlling for wealth, population and urban/rural status are also controlled for, as it stands to reason that larger communities may be more likely to have more groups. Similarly, the patterns of community group formation may be different across urban and rural settings.

For all models, standard errors are computed by allowing for community-level clustering as well as general heteroscedasticity. T-statistics are presented in parentheses.

The first dependent variable is self reported health status (SRHS). This variable is an indicator with the values 1 (very healthy), 2 (somewhat healthy), 3 (somewhat unhealthy), and 4 (very unhealthy). This variable is included as is and an OLS regression is run. This specification places equal weight on each transition from one health state to another, which is an arbitrary assumption. There is a marked age pattern with SRHS, with older people more likely to report poor status, and this accelerates with age beyond 60. People who are employed are more likely to report better health status. People who live in communities with high social capital are also

significantly more likely to report better health status. The other community-level variables are not significantly different from zero.

The second variable considered is the number of activities of daily living (ADLs, out of a total of 9) that the respondent reports being able to perform "with difficulty or not at all." Again, there is a strong age pattern, with elderly having a higher score. Women also report fewer "easy" ADLs, as do those with a post elementary education. The employed report significantly more "easy" ADLs. Those who live in communities with high social capital score better on this variable, as do those who live in rural communities.

The next variable considered in Table 6 is an indicator for whether a person has felt fatigue. This model (as well as that for bodily pain) is estimated with a probit model. Reports of fatigue are found to increase with age only for those over 60, and that increased household expenditure is positively associated with fatigue. The social capital variable is strongly negatively correlated with fatigue. Further, people in more populated communities report less fatigue, and people in urban areas report more fatigue.

The final variable is an indicator for the experience of bodily pain. Older people are much more likely to report bodily pain, and those who are employed are much less likely to do so. Again, social capital is strongly negatively related to bodily pain. No other community-level variables are correlated with this condition.

5. Mental Health Variables

Table 5 estimates probit models for the four mental health variables: sadness, anxiety, insomnia, and short temper. The coefficients in Table 5 are presented as probability derivatives. In

the case of binary exogenous variables, the change is presented in probability associated with a change from 0 to 1 of the exogenous variable.

Results from column 1 show the model used for reported sadness. They indicate that there is not a strong age pattern in reported sadness – each of the age variables is insignificantly different from zero. Women are significantly more likely than men to report feeling sad – on average 4 percentage points more likely. There is not a significant difference between those with less than elementary education and those with elementary education. Individuals with greater than elementary education are two percentage points less likely to report feeling sad. Employment status is not correlated with sadness, and household per capita expenditure is weakly positively (significant at the 10% level) correlated with sadness. Among the community-level variables, both social capital as well as the size of the community are associated with reduced sadness. The magnitude on the social capital variable indicates that a one standard deviation increase (measured at the village level) in social capital is associated with a decreased propensity to report feeling sad of 2 percentage points, a 14% decline from the mean level. Being in an urban area is associated with greater reported sadness.

The second column reports results for anxiety. Results indicate that there is no strong age gradient in reported anxiety. Women are much more likely to report being anxious (2.4 percentage points, with a mean prevalence of 6%), and individuals with greater than a high school degree are also more likely to report feeling anxious. The social capital variable is highly negatively associated with reports of anxiety. The community-level socioeconomic and population variables are not significantly correlated with anxiety, while individuals living in urban areas are much more likely to report feeling anxiety.

The third column reports results for trouble sleeping. As with the previous two measures, there are no strong age patterns, and women are significantly more likely than men to report sleeping troubles. Education and total expenditure are not strongly correlated with insomnia, although those who are working are much less likely to report sleeping difficulties. Again, the measure of social capital is strongly negatively associated with insomnia, while none of the other community-level variables are significantly correlated with this outcome.

The last column in Table 4 presents results for self-reports of experiencing a short temper. For individuals aged less than 50 there is no strong age pattern, but for those older than 50, age is associated with increasing short-temperedness. Women are almost 6 percentage points more likely to report being short tempered. This condition is not significantly correlated with any of the individual-level SES variables. As with the other three conditions, this is strongly negatively associated with social capital. It is also negatively correlated with the community population. None of the other community-level variables are significantly correlated with this condition. At this point it should be noted that one universal finding across all measures is that women are more likely to report poor outcomes for these questions. This is consistent with the one source of external data for the region, in which the World Bank reports that the number of DALYs lost to women due to unipolar major depression in Other (non China, non India) Asia and Islands are twice those lost by men (World Bank, n.d. 3).

To summarize the results from Tables 4 and 5, for a wide variety of mental and physical health conditions, living in a community with a greater number of active community-level organizations is strongly related with better health. This variable, indeed, is the only variable

among those considered that is found to be protective for every condition that we considered. This is the case after controlling for a variety of individual-level and community-level covariates.

We have tried several variations on our preferred specification. For each of the dependent variables, we have modeled the influence of age on health in several different functional forms. These have included polynomials up to third order, splines with knots (allowing for slope changes) every 10 years, and several specifications based on indicator variables. In no specification is strong evidence of nonlinearities not captured in the results found.

In addition to testing for difference in age specification, we examined several other specifications. Many subsets of the control variables were left out and the results for social capital were not highly sensitive to this. The point estimates change somewhat depending on the other control variables, but they were always large and significant. We tested for nonlinearities in the impact of community population and found no significant evidence for this. An interaction between urban status and community population was also allowed for but no such significant interaction was found. The models were also estimated excluding the population term and also excluding the urban term. The main results were not affected by these changes. Potential nonlinearities in the impact of the social capital variable were also searched for and not found. We conclude that the main finding, that of a strong correlation between the number of community organizations and good health, is a fairly robust finding.

6. Interactions Between Social and Human Capital

We next consider the interactions between human capital and social capital in the following way: human capital is modeled with indicators for education level, and social capital is modeled

with the variable for the number of organizations active in the community. The interaction between these two variables is tested for by including the interactions in the specifications:

$$h_{ic} = \alpha_0 + \alpha_1 age_{ic} + \alpha_2 ED1_{ic} + \alpha_3 ED2_{ic} + \beta_1 SC_c + \delta_1 ED1_{ic} * SC_c + \delta_2 ED2_{ic} * SC_c + \beta_{21} Z_c + \varepsilon_{ic}$$

This specification is estimated on four dependent variables: reported sadness, reported anxiety, SRHS, and # of "difficult or impossible" ADLs. Results are presented in Table 6. In general, there is weak and mixed support for the interaction between human and social capital. With regard to the mental health questions, there is evidence of interactions for anxiety, but not for sadness. With regard to the physical health questions, there is evidence for interactions with the ADL specification, but not for the SRHS specification.

When the mental health outcomes are examined, one regression with significant interactions is the anxiety specification. Here the base coefficient on social capital indicates that being in a community with higher numbers of active groups is associated with a lower likelihood of reporting anxiety. Evaluated at 3 groups (the 25th percentile) active in the community, the results indicate that those with post-elementary education are almost 4 percentage points more likely to report being anxious than their counterparts with elementary education. Evaluated at 7 groups (the 75th percentile), this gap increases to 6.8 percentage points. In this instance, is seems that social capital interacts with human capital in a way that exacerbates the health differences across education groups.

In the ADL regression, the base coefficient on the number of groups in the community is negative, indicating that individuals living in communities with greater levels of social capital are healthier. Note that the interactions between post elementary education and social capital have the

opposite sign to their main effects. The estimated coefficients imply that for individuals with post-elementary education, the relationship with respect to social capital is approximately zero. In other words, social capital is protective for those with low and middle education, but is not correlated with ADLs for those with high education.

7. Extensions

Types of Community Groups

Our social capital variable is a summation of the number of categories of community groups that are active per community. Of interest is whether certain types of community organizations are particularly associated with improved health outcomes. Our canonical measure of social capital is a variable ranging from 0 to 11, depending on how many types of community groups are active. This aggregate index is the sum of eleven separate indicator variables, each having a value of one or zero depending on the presence or absence of a particular type of community group.

In order to explore which types of community groups matter, we disaggregate the social capital variable into its 11 components, and include each component separately as a dummy variable. This specification has eleven separate variables, each one an indicator for the presence of a particular category of community group. Results from this model are presented in Table 7, estimated for each of our 8 dependent variables. Only the coefficients for the 11 community groups are shown, but the full set of controls is included in the regression.

It does not appear that each category of group contributes in an equal fashion to mental and physical health. For sadness, the two strongest correlates of improved health are the existence of a pharmacy garden (with a large but statistically insignificant coefficient), the existence of a family planning group (estimated to be very large and statistically significant), and the existence of the 10

HH program (also large but insignificant). The other groups do not appear to be strongly correlated with sadness. The same results hold true for anxiety – the same 3 groups are associated with reduced anxiety. For insomnia, again the pharmacy garden and family planning group are significantly associated with better health. For short temper, the pharmacy garden is strongly and significantly associated with better outcomes.

When the physical health conditions are considered the patterns are somewhat less clear. For self reported health status, the presence of savings and borrowing groups is associated with better health. For the ADL measure, the only significant correlate of improved health is the family planning group. For the presence of body pain and fatigue, the Pharmacy garden is protective, and the 10 Household program is also protective for bodily pain.

To conclude, this table focuses attention on evidence that several of the groups are more protective than the others. In particular, it appears that the existence of a pharmacy garden and family planning acceptors' groups, as well as the 10 HH Program, is associated with better mental and physical health.

Including physical health on the RHS

Table 8 reports the results from an exploration of the interaction between physical and mental health. This is done by including into each model a variable for the number of ADLs easy to perform. This model is then, in turn, estimated for each of the dependent variables (excluding the ADL variable). This variable is highly predictive of sadness, indicating that people with difficulties with ADLs are much more likely to report sadness. However, it should be noted that the coefficient on social capital does not change much at all. The same result holds true for each of our other dependent variables. When the ADL variable is included, it is strongly predictive of good

health. However, the social capital variable also remains associated with good health when the ADL variable is included.

Including mean LHS as a RHS variable

Table 9 presents results from one last specification check. This last table is based on our canonical specification. In addition to the usual variables, the community-level mean of the LHS variable is included as an independent variable. For each individual, the mean sadness (for example) over the other individuals in the community is computed. In this way a mechanical correlation between that individual's error and the mean sadness variable is avoided.

We note that including this variable absorbs much of the community-level variation, and makes interpreting the coefficients on the community-level variables difficult. For instance, if the data were only community-level data, a model with this variable included would not be identified. In a model with individual-level characteristics, the community-level variables are identified from variations in the distributions of the individual-level variables. Consider the following thought experiment: compare two individuals who live in communities with X% of the people sad. In community A, there is a low degree of social capital (thought of as protective for sadness) but relatively more people have post-secondary education (also protective). In community B, fewer people have post-secondary education, but there is more social capital. In this way, the two communities have the same mean level of sadness. For two individuals with identical characteristics living in the two communities, is the individual living in the community with higher social capital less sad than the one living in the community with lower social capital?

Before turning to the results, we note that this specification is a strict test of the correlation with community-level characteristics. Results from column 1 of Table 9 indicate that with sadness

as the dependent variable, the social capital variable is not different from zero. The same holds true for anxiety. However, for insomnia and short temper, the social capital variable is still significantly correlated with improved mental health. Thus, in this strict test of the social capital model, there is mixed evidence that social capital is related to mental health.

The results for physical health allow for more of a role for social capital. For SRHS, ADLs, and Fatigue, social capital is still found to be significantly protective. For body pain, the coefficient is insignificant. In all specifications, the mean LHS variable is strongly predictive.

8. Conclusion

In this paper we have looked at the relationship between health and several individual- and community-level variables. We focus our attention on human capital (education) and social capital (number of community organizations). Across a variety of physical and mental health measures, we find social capital to be positively associated with good health. This relationship is robust to a number of specification checks. We find evidence for a relationship between human capital and mental health for some, but not all, of the health measures used. There is mixed evidence for the existence of interactions between social and human capital.

The various components of the social capital measure, when examined, show that a few groups in particular are associated with improved health. These components are the existence of a pharmacy garden and family planner's acceptance groups. The social capital results are robust to including measures of physical health as a control variable. Finally, in the most rigorous test of the social capital model, mixed evidence is found that the correlation between social capital and health outcomes is significant.

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Figure 1: The Inter-Relationships Among Human and Social Capital and Health

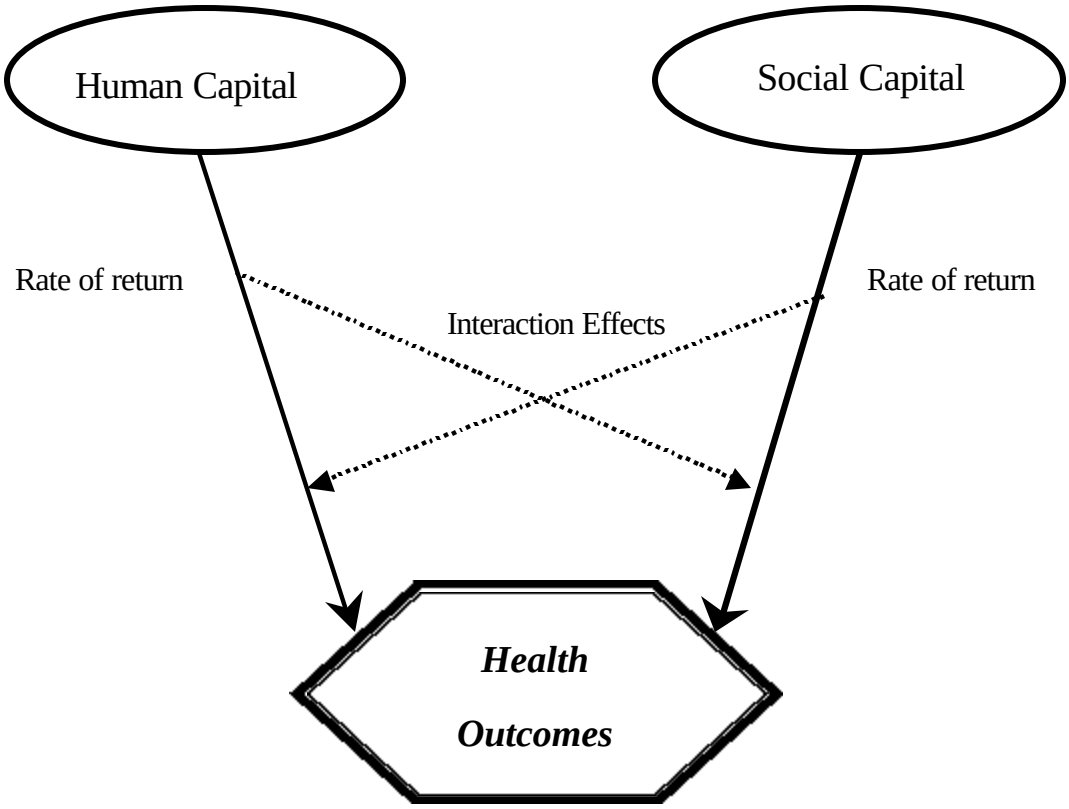

Table 1

Summary Statistics - Individuals

Health and Mental Health Variables

		Mean	Std. Deviation	# obs
General Health Variables	Fatigue	0.264	0.441	10971
	Bodily Pain	0.193	0.399	10971
	Self Reported Health Staus	1.96	0.55	10956
	# of ADLs "Easy"	8.55	1.31	10971
Mental Health Variables	Sadness	0.142	0.349	10971
	Anxious	0.06	0.237	10971
	Trouble Sleeping	0.211	0.408	10971
	Short Temper	0.142	0.35	10971

Note: Self reported health status ranges from 1 (best) to 4 (worst). This table reports the arithmetic mean of individuals' SRHS. Data are from the 1993 and 1997 waves of the Indonesian Family Life Survey.

Table 2

Summary Statistics - Individuals

Demographic Variables	Mean	Std. Deviation	# obs
Age	45	13.3	10971
Fraction Age >= 50	0.37	0.48	10971
Fraction Age >= 60	0.17	0.38	10971
Female	0.54	0.49	10971
Socioeconomic Variables			
Less than Elementary Education	0.26	0.44	10971
Post Elementary Education	0.2	0.4	10971
Employed	0.65	0.48	10971
Log(Per capita monthly expenditure)	10.8	0.81	10971
Per capita expenditure, US$	33	50	10971

Note: Conversion to US$ based on 2105 Rupiah/US$. Data are from the 1993 and 1997 waves of the Indonesian Family Life Survey.

Table 3

Summary Statistics - Communities

	Mean	Std. Deviation	# obs
General variables			
Urban	0.574	0.495	303
Community Population	11361	20473	303
Socioeconomic variables			
Ever received "underdeveloped village" funds	0.211	0.409	303
Mean HH (per capita expenditure)	39.2	21.3	303
Social Capital variable			
# (out of 11) of active community organizations	5.34	2.64	303

Note: Unit of observation is the community, as identified in the IFLS. Means are unweighted. Per capita expenditure is in US$/month. Data are from the 1993 and 1997 waves of the Indonesian Family Life Survey.

Table 4

General Health Variables

		Outcome Variable			
		SRHS	#of ADL "difficult or impossible" to perform	Fatigue	Bodily pain
	Mean of LHS variable	1.96	0.46	0.265	0.199
Individual variables	Age	0.00716	0.01859	0.00034	0.00179
		(6.73)	(7.00)	(0.33)	(2.22)
	Age * (Age >= 50)	0.00016	-0.00070	-0.00049	0.00011
		(0.39)	(0.69)	(1.41)	(0.34)
	Age * (Age >= 60)	0.00118	0.00784	0.00101	0.00047
		(3.18)	(8.84)	(3.36)	(1.94)
	Female*	-0.01325	0.13245	0.01328	0.01579
		(0.76)	(4.43)	(1.06)	(1.47)
	Less than elementary education	-0.04027	0.06450	-0.01026	-0.01429
		(1.73)	(1.48)	(0.62)	(1.00)
	Post elementary education	-0.00256	0.06039	0.00192	-0.02178
		(0.14)	(1.96)	(0.13)	(1.62)
	Employed*	-0.09112	-0.34856	-0.00125	-0.04494
		(5.61)	(8.92)	(0.09)	(4.01)
	Log(Per capita expenditure)	-0.00289	-0.03860	0.01942	0.00959
		(0.30)	(1.48)	(2.51)	(1.37)
Community Variables					
	# of groups in community	-0.01949	-0.01979	-0.01322	-0.00857
		(3.45)	(2.22)	(2.65)	(2.62)
	Mean ln(exp)	-0.01151	-0.01408	0.03619	0.04522
		(0.34)	(0.25)	(1.13)	(1.84)
	Received "Underdeveloped" village funds	0.01499	-0.06678	0.02882	0.00755
		(0.38)	(1.19)	(0.98)	(0.41)
	Ln(Community Population)	-0.01851	-0.03706	-0.03433	0.00055
		(1.32)	(1.41)	(2.29)	(0.07)
	Urban*	0.04110	0.12302	0.07009	0.02107
		(1.28)	(2.53)	(2.45)	(1.14)
	Observations	10971	10971	10971	10971
	(Pseudo) R-squared	0.064	0.133	0.013	0.019

Notes:

SRHS is self-reported-health-status on a 1 to 4 scale, with 1 being best health and 4 being worst health. # ADL easy is the number (out of 13) of Activities of daily living that the individual can easily do. Errors are computed to allow for clustering within community. In columns 3 and 4, coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector.

Table 5
Mental Health Conditions

		Dependent Variable			
		Sad	Anxious	Insomnia	Short Temper
	Mean of LHS var	0.141	0.06	0.212	0.142
Individual variables	Age	0.00110	0.00020	0.00145	-0.00022
		(1.60)	(0.40)	(1.59)	(0.29)
	Age * (Age >= 50)	-0.00041	-0.00027	-0.00015	0.00059
		(1.46)	(1.31)	(0.43)	(2.08)
	Age * (Age >= 60)	0.00024	0.00005	0.00027	0.00012
		(0.95)	(0.30)	(1.08)	(0.59)
	Female*	0.04072	0.02435	0.03387	0.05728
		(4.75)	(4.28)	(3.12)	(6.25)
	Less than elementary education	-0.00937	-0.00283	-0.02036	-0.01658
		(0.78)	(0.31)	(1.36)	(1.38)
	Post elementary education	-0.02202	0.01929	-0.01465	0.01123
		(1.86)	(2.58)	(1.16)	(0.92)
	Employed*	-0.00471	-0.01011	-0.04378	0.00798
		(0.57)	(1.76)	(4.33)	(0.93)
	Log(Per capita expenditure)	0.00946	0.00136	0.00874	0.01006
		(1.56)	(0.32)	(1.24)	(1.82)
Community Variables					
	# of groups in community	-0.00773	-0.00487	-0.01168	-0.01119
		(2.32)	(2.42)	(3.41)	(3.38)
	Mean ln(exp)	0.00946	0.00778	0.03799	0.03536
		(0.57)	(0.43)	(1.44)	(1.47)
	Received "Underdeveloped" village funds	0.02046	0.01019	0.00802	-0.01437
		(1.13)	(0.93)	(0.40)	(0.80)
	Ln(Community Population)	-0.02269	-0.00994	-0.01644	-0.01768
		(2.91)	(1.79)	(1.76)	(2.23)
	Urban*	0.05165	0.03408	0.02750	0.06444
		(2.86)	(2.79)	(1.44)	(3.45)
	Observations	10971	10971	10971	10971
	Pseudo R-squared	0.016	0.027	0.015	0.031

Notes:

Dependent variable equals 1 if respondent reports feelind sadness in the past week. In colum 4, errors are computed to allow for clustering within community. Coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector.

Table 6

Interactions between social and human capital

		Outcome Variable			
		Sad	Anxious	SRHS	#of ADL "difficult or impossible" to perform
	Mean of LHS variable	0.141	0.06	1.96	0.46
Individual variables	Age	0.00107	0.00017	0.00716	0.01851
		(1.56)	(0.34)	(6.74)	(6.97)
	Age * (Age >= 50)	-0.00040	-0.00025	0.00018	-0.00068
		(1.43)	(1.23)	(0.43)	(0.66)
	Age * (Age >= 60)	0.00025	0.00007	0.00120	0.00788
		(0.99)	(0.38)	(3.24)	(8.87)
	Female*	0.04067	0.02386	-0.01262	0.13243
		(4.72)	(4.25)	(0.72)	(4.43)
	Less than elementary education	-0.01331	0.00882	0.01576	0.07082
		(0.54)	(0.44)	(0.38)	(0.74)
	Post elementary education	-0.05883	0.01861	-0.02735	-0.74976
		(2.51)	(1.46)	(0.73)	(1.15)
	Employed*	-0.00500	0.00995	-0.09034	-0.34909
		(0.60)	(1.73)	(5.55)	(8.95)
	Log(Per capita expenditure)	0.00937	0.00116	-0.00337	-0.03883
		(1.54)	(0.27)	(0.34)	(1.49)
Community Variables					
	# of groups in community	-0.00970	-0.00614	-0.01762	-0.02542
		(2.48)	(2.81)	(2.93)	(2.39)
	# groups * (Education less than elementary)	0.00082	-0.00286	-0.01221	-0.00170
		(0.16)	(0.64)	(1.47)	(0.09)
	# groups * (Education greater than elementary)	0.00791	0.00704	0.00430	0.02500
		(1.83)	(2.75)	(0.70)	(2.22)
	Mean ln(exp)	0.01233	0.00779	-0.01160	-0.01628
		(0.55)	(0.47)	(0.35)	(0.29)
	Received "Underdeveloped" village funds	0.01990	0.00871	0.01323	0.06439
		(1.10)	(0.82)	(0.33)	(1.14)
	Ln(Community Population)	-0.02303	-0.01032	-0.01887	-0.03805
		(2.94)	(1.86)	(1.34)	(1.46)
	Urban*	0.05206	0.03357	0.03967	0.12317
		(2.91)	(2.89)	(1.24)	(2.55)
	Observations	10971	10971	10971	10971
	(Pseudo) R-squared	0.017	0.030	0.065	0.133

Notes:

SRHS is self-reported-health-status on a 1 to 4 scale, with 1 being best health and 4 being worst health. # ADL easy is the number (out of 13) of Activities of daily living that the individual can easily do. Errors are computed to allow for clustering within community. In columns 3 and 4, coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector.

Table 7

Specification checks

	Outcome Variable							
	Sad	Anxious	Insomnia	Short Temper	SRHS	#of ADL "difficult or impossible" to perform	Bodily Pain	Fatigue
Save and Borrow Group	-0.02938	-0.10700	-0.08219	-0.05324	-0.05938	0.03048	-0.04073	-0.01210
	(0.36)	(1.20)	(1.22)	(0.69)	(2.27)	(0.62)	(0.62)	(0.15)
Cooperative	0.00760	-0.00550	0.05327	-0.06651	-0.02991	0.00256	0.06795	-0.06526
	(0.11)	(0.06)	(0.83)	(0.92)	(1.04)	(0.05)	(1.13)	(0.69)
"Pharmacy" Garden	-0.11092	-0.15220	-0.16017	-0.20931	-0.09294	-0.03065	-0.15262	-0.15638
	(1.69)	(2.09)	(2.74)	(3.13)	(2.71)	(0.72)	(2.46)	(2.13)
Family Planning Acceptors'	-0.14298	-0.15319	-0.10780	-0.11956	-0.00515	-0.17321	-0.00290	-0.13718
	(2.31)	(2.19)	(1.99)	(1.89)	(0.16)	(4.26)	(0.05)	(1.79)
Child Development Group	0.05631	0.09565	-0.00452	0.03282	-0.02161	-0.01572	-0.02738	0.07179
	(0.76)	(1.25)	(0.07)	(0.44)	(0.61)	(0.32)	(0.42)	(0.90)
Adolescents' Group	0.04545	0.15227	0.01890	-0.01692	0.07666	0.03782	0.07068	-0.03401
	(0.75)	(2.04)	(0.32)	(0.21)	(2.55)	(0.68)	(1.18)	(0.39)
Senior Citizens' Group	-0.00271	0.01151	-0.04561	-0.00233	-0.01588	-0.00488	-0.00443	-0.07523
	(0.03)	(0.13)	(0.71)	(0.03)	(0.46)	(0.09)	(0.08)	(0.85)
Youth Group	-0.09373	-0.11510	-0.06546	-0.00585	-0.04695	-0.10951	-0.01035	-0.10388
	(1.17)	(1.19)	(0.95)	(0.07)	(1.48)	(2.03)	(0.15)	(1.08)
Health Fund	0.05370	0.03885	0.02374	0.07913	-0.02926	0.02333	0.00915	-0.00515
	(0.71)	(0.50)	(0.37)	(1.09)	(0.76)	(0.48)	(0.13)	(0.06)
MCH Health Group	-0.01227	-0.03205	0.00768	-0.07143	-0.00044	-0.00059	-0.00127	-0.02300
	(0.14)	(0.34)	(0.11)	(0.96)	(0.02)	(0.01)	(0.02)	(0.25)
10 HH Program	-0.12005	-0.15375	-0.02282	-0.11094	0.03609	0.03302	-0.13344	0.03694
	(1.50)	(1.94)	(0.34)	(1.36)	(1.05)	(0.67)	(2.09)	(0.46)
Observations	10971	10971	10971	10971	10956	10971	10971	10971
Pseudo R-squared	0.021	0.037	0.019	0.037	0.074	0.137	0.024	0.017

Errors are computed to allow for clustering within community. In columns 3 and 4, coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector. Other RHS variables included are age, sex, expenditure, education, community population, urban status, mean expenditure, and if received underdeveloped village funds.

Table 8
Including physical health on RHS

	Sad	Anxious	Insomnia	Short Temper	SRHS	Fatigue	Bodily pain
# of gropus in community	-0.00702	-0.00440	-0.01089	-0.01081	-0.01686	-0.00761	-0.01230
	(2.20)	(2.33)	(3.33)	(3.37)	(3.15)	(2.43)	(2.53)
# of ADLs easy to perform	-0.03096	-0.01472	-0.04362	-0.02338	-0.14083	-0.05126	-0.05146
	(11.07)	(9.29)	(11.91)	(8.19)	(15.62)	(12.64)	(11.34)
Observations	10971	10971	10971	10971	10956	10971	10971
(Pseudo) R-squared	0.036	0.049	0.035	0.041	0.158	0.051	0.033

Notes: Errors are computed to allow for clustering within community. In columns 3 and 4, coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector. Other RHS variables included are age, sex, expenditure, education, community population, urban status, mean expenditure, and if received underdeveloped village funds.

Table 9

Including mean community values on RHS

	Sad	Anxious	Insomnia	Short Temper	SRHS	#of ADL "difficult or impossible" to perform	Fatigue	Bodily pain
# of gropus in community	-0.00162	-0.00167	-0.00401	-0.00333	-0.00497	-0.01215	-0.00335	-0.00221
	(1.33)	(1.84)	(2.74)	(2.66)	(3.35)	(2.26)	(2.57)	(1.61)
Mean of LHS variable in community	0.57164	0.36963	0.59509	0.57390	0.78194	0.47062	0.58573	0.78846
	(20.68)	(20.23)	(14.73)	(24.42)	(27.16)	(10.40)	(15.26)	(31.67)
Observations	10971	10971	10971	10971	10956	10971	10971	10971
(Pseudo) R-squared	0.062	0.079	0.043	0.084	0.140	0.146	0.049	0.092

Notes: Errors are computed to allow for clustering within community. In columns 3 and 4, coefficients are presented as probability derivatives for continuous variables, and change in probability for binary variables. Employed refers to both formal and informal sector. Other RHS variables included are age, sex, expenditure, education, community population, urban status, mean expenditure, and if received underdeveloped village funds. For each individual, the mean of the LHS variable is computed over all other individuals in the community.