Social Capital and Health in the Developing World:
Meaning, Mechanisms, and Measurement

by

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Dedication

To my wife:

“Many women do noble things,

but you surpass them all.”

Proverbs 31:29

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List of Acronyms

ART – Antiretroviral Therapy

HIV – Human Immunodeficiency Virus

ICDDR,B – International Center for Diarrheal Disease Research, Bangladesh

IHDS – India Human Development Survey

LDC – Least Developed Countries

MDG – Millennium Development Goals

SASCAT – Shortened and Adapted Social Capital Assessment Tool

SCAT – Social Capital Assessment Tool

Abstract

The overall goal of this dissertation is to contribute to the understanding of community-based development by exploring the relationship between social capital and health in the developing world. Distinct methodological approaches were applied to each chapter of this dissertation to examine (1) the association between social capital and physical health in the least developed countries, (2) the content validity of the measurement of social capital in Bangladesh, and (3) the relationship between different components of social capital and the utilization of maternal and child health services in India.

The study described in Chapter 2 used a systematic literature review process to show that social capital is an important factor for improving health in resource-poor settings; however, more research is needed in order to elucidate the mechanisms through which social capital affects health in the developing world. Chapter 3 used expert reviews, focus group discussions, and cognitive interviews to create a newly adapted social capital survey instrument for use by health and development organizations in Bangladesh. This study highlighted the importance of using cognitive interviews to ensure respondents are able to comprehend key terms, recall important information, and identify appropriate responses about social capital. Chapter 4 used exploratory factor analysis and multilevel logistic regression models to demonstrate that social capital operates at the community level in association with the utilization of antenatal care, professional delivery care, and childhood immunizations in India. Specifically, components of

social capital that led to heterogeneous bridging ties were positively associated with all three types of health services, whereas components of social capital that led to strong bonding ties were negatively associated with use of preventive care, but positively associated with professional delivery care.

Taken together, these three studies emphasized the theoretical and operational complexity of the concept of social capital and the importance of distinguishing between different components of social capital in order to understand their differential association with health behaviors. Policy implications include the need to develop innovative ways to strengthen community-level aspects of social relationships (social capital), while also making contributions to social resources available to individuals within communities (human and economic capital).

Chapter 1

Social Capital and Health in the Developing World: An Introduction

Over the past twenty years there has been significant progress made towards reaching the health-related Millennium Development Goals (MDGs). In the developing world, the under-five child mortality rate has declined by 35% (from 97 deaths per 1,000 live births in 1990 to 63 in 2010) and the maternal mortality ratio has declined by 45% (from 440 deaths per 100,000 live births in 1990 to 240 in 2010) (United Nations, 2012). Despite this progress, achievements have been unequally distributed, with a disproportionate number of maternal and child deaths still occurring in sub-Saharan Africa and South Asia. Furthermore, there are disparities within these two regions, as marginalized and vulnerable populations face an unequal burden of death and disease. The slow progress towards the health-related MDGs among the poorest populations has been attributed, in part, to ineffective programs that lack community involvement and participation (Rosato et al., 2008). Community participation complements facility-based service delivery strategies by increasing the demand for and use of maternal and child health services among populations that are often overlooked.

Strategies to promote community participation have been central to the field of community development, which defines "community-based development" as the involvement of communities in the planning, implementation, and management of health and development

programs. The community-based development process is most successful when communities are participating in the problem-solving process and they recognize that they can collectively change their circumstances. Community-based development programs have become a growing priority for development assistance organizations, as demonstrated by the increase in the World Bank's lending for such projects from US$325 million in 1996 to $2 billion in 2003 (Mansuri & Rao, 2004). In order for investments in community-based development to be successful, "top-down resources and bottom-up capacity building need to be in a dynamic and cooperative relationship" (Woolcock, 1998, p. 185). When top-down and bottom-up strategies are working together in a synergistic manner, the potential gains of community-based development include enhanced sustainability, improved efficiency and effectiveness, and greater agency for the poor (Mansuri & Rao, 2004). Despite the potential impact of and growing interest in community-based development strategies, little is known about the how these strategies may affect health outcomes in the developing world.

One way in which community-based development is related to health in the developing world is through health promotion. Wakefield and Poland (2005) describe community development as the "cornerstone" of health promotion strategies; however, this has not always been the case. Information-based health promotion strategies have been historically popular, but they have also been mostly ineffective due to their neglect of important aspects of the social environment, such as socioeconomic status and social connectedness. Besides being ineffective, information-based strategies have the potential to increase health inequalities because new information is likely to reach those who were already better off (Campbell & Gillies, 2001). In 1986, the Ottawa Charter established a new health promotion movement that emphasized key components of community-based development, namely participation, empowerment, and

collective action (Wakefield & Poland, 2005). The new community-based approach to health promotion provided an opportunity to develop and sustain health-enabling communities; however, there was a limited understanding of how to create these types of supportive environments.

The concept of "social capital" has been cited as the missing link to the relationship between community-based development, health promotion, and improved health outcomes (Campbell & Jovchelovitch, 2000; Grootaert & van Bastelaer, 2001). A community-based approach to health promotion can have an impact on health outcomes in the developing world by establishing local associations to help those who are vulnerable to poor health, building social networks between individuals with various levels of power, influencing normative health behaviors, and creating an environment of trust and reciprocity—all of which are aspects of social capital. If the evidence-base for the association between social capital and health in the developing world is strengthened, then community-based development and health promotion strategies can aim to build social capital in communities as a way of enabling the practice of healthy behaviors (Campbell & Gillies, 2001).

The overall goal of my dissertation is to contribute to this evidence-base by exploring the relationship between social capital and health—with a focus on maternal and child health—in the developing world. Before discussing the three empirical papers that will comprise my dissertation, I first discuss the meaning of social capital, the mechanisms through which it affects health outcomes, and how it is measured.

What is social capital?

Social capital has historical roots in sociology and political science. The two sociologists who have made the largest contributions to the theoretical development of social capital are James Coleman and Pierre Bourdieu. According to Coleman, "Social capital is defined by its function. It is not a single entity but a variety of different entities, with two elements in common: they all consist of actors—whether persons or corporate actors—within the structure (Coleman, 1988, p. S98)." Coleman emphasized the "social" aspect of social capital because he saw it as an attribute of the social structure, not the private property of individuals who benefit from it (Coleman, 1990). He focused on three mechanisms through which social capital is generated within families and communities: reciprocity exchanges, privileged access to information, and group enforcement of norms (Coleman, 1988). Coleman also discussed the negative aspects of social capital, where individuals who are embedded within tight-knit social groups are forced to adhere to harmful group norms (e.g., youth gangs or mafia families).

Bourdieu (1986) developed the idea of social capital in conjunction with economic capital (i.e., money) and cultural capital (e.g., education, taste) as a way of thinking about how social class is reproduced in society. He defined social capital as "the aggregate of actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition" (Bourdieu, 1986, p. 248). In contrast to Coleman's definition of social capital, Bourdieu not only emphasized relationships within a social network, but also the content of the resources accessible to those within the network. This conceptualization introduced the idea that the benefits of social capital can accrue to individuals based on their participation in social groups or networks. Bourdieu's emphasis on access to resources creates the potential for negative aspects of social capital as well, where

specific individuals can be excluded from obtaining resources tied to a certain network (Bourdieu, 1986; Carpiano, 2006).

Although Coleman and Bourdieu made the most significant contributions to social capital theory, the most influential theorist in the fields of public health and community development has been political scientist Robert Putnam (Carpiano, 2006). Putnam defined social capital as "the features of social life—networks, norms, and trust—that can improve the efficiency of society by facilitating coordinated actions" (Putnam, 1993, p.167). He described social capital as a collective characteristic of a community that benefits the community as a whole. Essentially, communities with greater "stocks" of generalized trust, civic engagement, and norms of reciprocity are more likely to experience positive economic, political, and social outcomes than those without these characteristics. In contrast to Bourdieu, Putnam focused on behaviors and norms of social groups rather than resources embedded within these groups. Putnam has been criticized for not paying attention to the negative aspects of social capital (Portes, 1998) and ignoring the influence of power and politics (Navarro, 2002).

In order to better understand the differences between the various conceptualizations of social capital, there has been an effort to dichotomize the theories mentioned above. Kawachi (2010) distinguishes between the "network" perspective and the "social cohesion" perspective; Wakefield and Poland (2005) compare the "critical" theory of social capital to the "communitarian" perspective; and Harpham and colleagues (2002) discuss the differences between "structural" social capital and "cognitive" social capital. This last dichotomy of social capital is more empirically-driven compared to the first two conceptualizations, which are more theoretically reflective. However, there are similarities between all three dichotomies. Network, critical, and structural theories reflect Bourdieu's conceptualization of social capital as an

individual attribute, where resources are accessible through one's social networks. This form of social capital tends to focus on what people *do* and is often objectively verified by assessing individuals' actions and behaviors. Social cohesion, communitarian, and cognitive theories align with Coleman's and Putnam's concept of social capital as a collective attribute comprised of social trust, reciprocity, and effective norms. This form of social capital tends to focus on what people *feel* and is often subjectively verified by assessing attitudes and perceptions. These two different forms of social capital should not be seen as mutually exclusive, but as complementary because they both contribute to the understanding of social capital (Harpham et al., 2002; Krishna & Shrader, 2000). Throughout the remainder of the dissertation, I will use the most common terminology for this dichotomy: structural and cognitive social capital.

Although there has been some disagreement about the use of structural and cognitive social capital, there appears to be consensus on the distinction between "bonding", "bridging", and "linking" social capital (Gittell & Vidal, 1998; Szreter & Woolcock, 2004). Due to the emphasis of this classification on social ties, these three forms of social capital are more closely related to structural social capital. Bonding capital refers to densely knit social networks where individuals are alike in terms of their social identity (e.g., race, class, age, place of residence). Bridging capital, by contrast, refers to associations between people who are typically not alike in terms of their social identity. Linking capital is a type of bridging capital where the relationship not only cuts across socio-demographic differences, but the individuals also differ with respect to power and authority gradients in society (Szreter & Woolcock, 2004). Each categorization of social capital is important to understanding how different aspects of social capital affect different health outcomes, as I discuss below.

How does social capital affect health?

Kawachi (2010) presents four primary mechanisms through which social capital influences health outcomes. Although these mechanisms focus on general health (i.e., self-rated health and mortality), they can be applied to health behaviors as well. The first pathway is through the perceived ability of a group to undertake collectively desired actions, also known as collective efficacy. More cohesive groups with access to appropriate resources through network linkages are better equipped for collective action to improve population health. This mechanism primarily reflects Bourdieu's (1986) conceptualization of social capital as access to resources embedded within social networks. However, collective efficacy can draw upon both structural and cognitive forms of social capital. From a structural social capital perspective, a community may develop a new social network through a civil society organization to leverage public resources. From a cognitive social capital perspective, a community may share the common value of working together to solve community problems. In these two cases, the networks and norms shared by the community allow residents to mobilize to undertake collective action to improve health outcomes.

A second mechanism is through informal social control, which refers to the ability of a group to enforce and maintain social norms (Kawachi, 2010). Informal social control is a collective characteristic that encourages individuals to forgo their own self-interest and act in the interests of the group (Coleman, 1988). This type of social control is manifested when a community feels empowered to step in to intervene when they observe deviant behavior. This mechanism typically draws upon aspects of cognitive social capital, such as shared community values and norms. For example, in response to domestic violence in South Africa, community members assembled outside the abuser's house and started banging on pots and pans (Mollmann,

2011). This response was motivated by a shift in community values from silent collusion to active opposition towards domestic violence.

The third pathway through which social capital affects health is by means of reciprocity exchanges (Kawachi, 2010). Again, this mechanism primarily makes use of aspects of cognitive social capital, such as norms of trust and a sense of belonging. Norms of reciprocity are established between members of a network when they help one another and trust that the favor will be returned by the initial recipient of the favor or by other members in the network. Coleman (1988) refers to these expectations of reciprocity as "credit slips". He suggests that as credit slips multiply, the result will be a community where people are constantly helping one another. For example, Coleman (1988) describes the value of reciprocity in rotating-credit associations in Southeast Asia. These associations are comprised of members of the community and typically meet once per month. Each person contributes a small amount of money that accumulates over time and can then be used for small capital expenditures or emergency health needs. Without a high degree of trust and a sense of obligation to the community among the members of these associations, this type of group would not exist.

The final way in which social capital influences health is through the diffusion of innovations via information channels that exist within a network (Kawachi, 2010). This mechanism of action is less dependent on the strength of the social connections within a network and more dependent on the reach of the network. The diffusion of information and other resources depends on individuals who can connect marginalized, unconnected groups to groups with resources. This mechanism draws upon aspects of bonding, bridging and linking social capital in order to connect individuals with valuable community resources. Examples of this mechanism in action include a family member who works in the city and brings contemporary

ideas to his or her village or a linking connection between an individual with political power and a member of a marginalized community in need of resources for health or education.

Although the mechanisms through which social capital influences health have primarily focused on the positive aspects of social capital, the same mechanisms can also lead to negative outcomes (Carpiano, 2008; Kawachi, 2010; Portes, 1998). Some of the mechanisms that lead to negative outcomes include (1) the exclusion of "outsiders" from reciprocity exchanges or innovative ideas, (2) the use of collective efficacy to further oppress individuals who are already marginalized, and (3) the restriction of individual freedom and contemporary ideas through informal social control. These negative outcomes are especially important in the context of community development and public health because vulnerable populations can be further marginalized by the downsides of social capital (Wakefield & Poland, 2005).

How is social capital measured?

Although the measurement of social capital is dependent on cultural context (Blaxter & Poland, 2002; Webber & Huxley, 2007), there is evidence of consistent use of specific components of social capital (both cognitive and structural) across a variety of studies (Kawachi et al., 2008; van Deth, 2003). The operational measurement of social capital depends on how it is defined (structural or cognitive), the types of social ties (bonding, bridging, or linking), the level of analysis (micro or macro), and whether it is conceptualized as an individual or a collective attribute (Harpham, 2008). The most common methods for measuring social capital are survey-based approaches, which are more individualistic in scope. Some of the common measures used to assess social capital in survey instruments are membership in community groups or associations; informal connections with family, friends, and neighbors; social

proactivity; political engagement; interpersonal and generalized trust; and perceived norms of reciprocity (Harpham et al., 2002; Narayan & Cassidy, 2001).

Most agree that social capital should be measured at both the individual and collective level because social capital resources at each level have been found to have different associations with health (Harpham, 2008). Individual-level measures of social capital are more common than group-level measures because of the popularity of the survey-based approach. Since there are few directly observable, group-level indicators of social capital, aggregating individual responses to community level is still the best way to obtain such a collective measure (Harpham, 2008). Aside from survey-based methods for measuring social capital, some researchers have used qualitative methods to provide important insights into the complexity of the relationship between social capital and health (Kawachi, 2010). Qualitative techniques, such as cognitive interviewing, are uniquely useful to the study of social capital because they allow for a better understanding of how respondents interpret questions about social capital and what each question is actually measuring (Blaxter & Poland, 2002).

What are the implications for developing countries?

Social capital has the potential to impact the health of the most vulnerable populations in resource-poor countries as a substitute for others kinds of capital that they are lacking, such as human or economic capital. There are three primary reasons why it is important to invest time and resources into the study of social capital and health in the developing country context: (1) it has been linked to lower levels of mortality and better self-rated health (Kim et al., 2008); (2) it can provide a theoretical basis for assessing the impact of community-based health promotion programs (Campbell & Jovchelovitch, 2000); and (3) it can be used by the poor as a primary

means of protection against risk and vulnerability (Carroll, 2001). The importance of social capital in the developing world is further supported by the World Bank's Social Capital Initiative—a program that was created to advance the theoretical understanding and the practical relevance of social capital in community development. According to Grootaert and van Bastelaer (2001):

> "The overriding lesson that emerges from the Social Capital Initiative is that it is possible to measure social capital and its impact. The empirical studies indicate that social capital has a profound impact in many different areas of human life and development. More generally, it helps alleviate poverty for individuals and for countries as a whole (p. 21)."

Research goal and specific aims

The goal of my dissertation is to explore the meaning, mechanisms and measurement of social capital and health in developing countries. Specifically, my dissertation research aims to achieve the following:

Specific Aim #1: Provide a critical review of studies examining the association between social capital and physical health in the least developed countries and suggest future directions for research related to social capital and health in the developing world.

Specific Aim #2: Examine the content validity of the measurement of social capital used in the shortened and adapted version of the Social Capital Assessment Tool (SASCAT) among men and women in an urban and rural area in Bangladesh.

Specific Aim #3: Examine the relationship between different components of social capital and the utilization of maternal and child health services in India using a multilevel framework.

Proposed dissertation research

My dissertation will contribute to the existing literature by examining the conceptualization and operationalization of social capital in the developing world. The three empirical papers in my dissertation build upon one another to present (1) the current conceptualization of social capital in the poorest countries in the world; (2) the operational measurement of social capital in one of the least developed countries, Bangladesh; and (3) the association of social capital and health care utilization in a lower-middle income country, India.

In Chapter 2, I present a critical review of the literature on social capital and physical health (including health behaviors) in the least developed countries (LDCs). This review is motivated by the dearth of evidence from developing countries on the conceptualization of social capital and the relationship between different forms of social capital and health (Kim et al., 2008; Harpham, 2002). Given the potential impact of social capital on health outcomes, there is a need to examine this relationship in the poorest countries in the world. Specifically, the 48 countries that are currently classified as LDCs by the United Nations have great potential to benefit from the various forms of social capital due to their low income, weak human resources, and high economic vulnerability (United Nations, 2011). The review is based on a literature search using three databases from 1990 to 2011 using the keyword "social capital" combined with the name of each of the 48 LDCs. This paper not only provides a critical review of studies

examining the association between social capital and physical health in the LDCs, but it also suggests future research directions for social capital and health in the developing world.

In Chapter 3, I examine the content validity of the measurement of social capital used in the shortened and adapted Social Capital Assessment Tool (SASCAT) in Bangladesh using qualitative methods, including focus group discussions and cognitive interviews. The current debate about the usefulness of social capital as a theoretical construct is due, in part, to the lack of reliable measures of social capital that have been validated over a number of years in multiple settings. To date, no social capital survey instrument has been validated in Bangladesh, a country that has the potential to benefit from social capital due to limited human capital and high economic vulnerability. Given the lack of a validated social capital survey instrument in Bangladesh, I went to one rural sub-district (Durgapur) and one urban slum (Mirpur) in Bangladesh to cognitively test the SASCAT. In collaboration with four interviewers from the International Center for Diarrheal Disease Research, Bangladesh (ICDDR,B), we conducted a total of four focus group discussions and 32 cognitive interviews. Based on the findings I propose a newly adapted social capital survey instrument that can be used by future health and development organizations in Bangladesh.

In Chapter 4, I examine the association between social capital and the utilization of three types of maternal and child health services—antenatal care, professional delivery care, and childhood immunizations—using the 2005 India Human Development Survey (Desai et al., 2005). Although the body of evidence linking social capital to lower levels of mortality and better self-rated health continues to grow, little is known about the relationship between social capital and health care utilization in lower middle income countries, such as India. I used exploratory factor analysis to create and validate six social capital measures and subsequently

used these measures in multilevel logistic regression models at the individual and community level. This study provides novel evidence on the contextual effect of different forms of social capital on maternal and child health care utilization in India, including the negative effects of social capital on health care use.

Together, all three papers propose new directions for future research as well as policy implications for social capital and health in the developing world. In order to influence social policy to create more equitable health systems and to inform development assistance organizations about the importance of social capital, it is imperative to build an evidence-base for the effect of social capital on health in the developing country context, especially among marginalized and vulnerable populations. My dissertation research will be an initial contribution to the evidence-base on social capital and health in the developing world.

References

Blaxter, M., and Poland, F., 2002. Moving beyond the survey in exploring social capital. In: Swann, C. and Morgan, A. (Eds.), *Social Capital for Health: Insights from Qualitative Research*. London: Health Development Agency, pp. 87-107.

Bourdieu, P., 1986. The forms of capital. In J. G. Richardson (Ed), Handbook of theory and research for the sociology of education. New York, Greenwood Press, pp. 241-258.

Campbell, C., and Gillies, P., 2001. Conceptualizing 'social capital' for health promotion in small local communities: A micro-qualitative study. *Journal of Community and Applied Social Psychology*, 11(5), 329-346.

Campbell, C., and Jovchelovitch, S., 2000. Health, community and development: Towards a social Psychology of participation. *Journal of Community and Applied Social Psychology*, 10(4), 255-270.

Carpiano, R.M., 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62(1), 165-175.

Carpiano, R.M., 2008. Actual or potential neighborhood resources and access to them: Testing hypotheses of social capital for the health of female caregivers. *Social Science and Medicine*, 67(4), 568-582.

Carroll, T.F., 2001. Social capital, local capacity building and poverty reduction. Social Development Papers No. 3, Office of Environmental and Social Development, Asian Development Bank.

Coleman, J.S., 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94(Suppl.), S95-S120.

Coleman, J.S., 1990. Foundations of social theory. Cambridge, MA: Harvard University Press.

Desai, S., Vanneman, R., and National Council of Applied Economic Research, New Delhi. India Human Development Survey (IHDS), 2005 [Computer file]. ICPSR22626-v8. Ann Arbor,

MI: Inter-university Consortium for Political and Social Research [distributor], 2010-06-29. doi:10.3886/ICPSR22626.v8

De Silva M.J., Harpham T., Tuan T., Bartolini R., Penny M.E., Huttly S.R., 2006. Psychometric and cognitive validation of a social capital measurement tool in Peru and Vietnam. *Social Science and Medicine*, 62(4), 941-953.

Gittell, R. and Vidal, R., 1998. Community Organizing: Building Social Capital as a Development Strategy. Thousand Oakes, CA, Sage Books.

Grootaert, C., and van Bastelaer, T., 2002. Understanding and measuring social capital: A multidisciplinary tool for practitioners. Washington, DC: World Bank.

Harpham, T., Grant, E., and Thomas, E., 2002. Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17(1), 106–111.

Harpham, T., 2008. The measurement of community social capital through surveys. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*. New York, NY, Springer, pp. 51-62.

Kawachi, I., 2010. Social capital and health. In C. Bird, P. Conrad, A. M. Fremont, and S. Timmermans (Eds), *Handbook of Medical Sociology*, 6th Edition, Nashville, Vanderbilt University Press, pp. 18-32.

Kim, D., Subramanian, S.V., Kawachi I., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 139-190.

Krishna, A., and Shrader, E., 2000. Cross-cultural measures of social capital: A tool and results from India and Panama. Washington, DC: World Bank.

Mansuri, G., and Rao, V., 2004. Community-based and -driven development: A critical review. *World Bank Research Observer*, 19(1), 1-39.

Mollmann, M., 2011. Making noise about violence and women. Huffington Post. Retrieved from http://www.huffingtonpost.com/marianne-mollmann/making-noise-about-violen_b_874371.html. Accessed on August 16, 2011.

Narayan, D., and Cassidy, M.F., 2001. A dimensional approach to measuring social capital: Development and validation of a social capital inventory. *Current Sociology*, 49(2), 59-102.

Navarro, V., 2002. A critique of social capital. *International Journal of Health Services*, 32(3), 423-443.

Portes, A., 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24(1), 1-24.

Putnam, R.D., 1993. The prosperous community: Social capital and public life. *The American Prospect*, 38.

Rosato, M., Laverack, G., Grabman, L.H., Tripathy, P., Nair, N., Mwansambo, C., Azad, K., Morrison, J., Bhutta, Z., Perry, H., Rifkin, S., Costello, A., 2008. Community participation: lessons for maternal, newborn, and child health. *The Lancet*, 372(9642), 962-971.

Szreter, S. and Woolcock, M., 2004. Health by association? Social capital, social theory and the political economy of public health. *International Journal of Epidemiology*, 33, 650-667.

United Nations, 2011. World Statistics Pocketbook 2010: Least Developed Countries. New York: United Nations.

United Nations, 2012. Millennium Development Goals Report 2012. New York: United Nations.

Wakefield, S.E. and Poland, B., 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60, 2819-2832.

Woolcock, M., 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27, 151-208.

Chapter 2

Social capital and health in the least developed countries: A critical review of the literature and implications for a future research agenda

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Chapter abstract

Research on the linkage between social capital and health has grown in recent years; however, there is a dearth of evidence from resource-poor countries. This review examines the association between social capital and physical health (including health behaviors) in the least developed countries (LDCs). Citations were searched using three databases from 1990 to 2011 using the keyword "social capital" combined with the name of each of the 48 LDCs. Of the 14 studies reviewed, 12 were set in Africa and two in South Asia. All used cross-sectional study designs, including five qualitative and nine quantitative studies. The literature reviewed suggests that social capital is an important factor for improving health in resource-poor settings; however, more research is needed in order to determine the best measures for social capital and elucidate the mechanisms through which social capital affects health in the developing world. Future research on social capital and health in the developing world should focus on applying

theoretical conceptualizations of social capital to the developing country context, adapting and validating instruments for measuring social capital, and examining multilevel models of social capital and health in developing countries.

Introduction

Social capital—a broad term including social relationships, networks, and values that facilitate collective action for mutual benefit—is one of the most popular concepts from sociology to be applied to public health. Since the mid-1990s, research on the linkage between social capital and health has grown exponentially (Kawachi et al., 2008). However, there is limited evidence from developing countries on the conceptualization of social capital and the relationship between different forms of social capital and health, with the majority of the studies taking place in the industrialized country context (Kim et al., 2008; Harpham, 2008). A systematic review of social capital and mental health found 21 studies, of which only two were set in developing countries (De Silva et al., 2005). Although mental health studies offer insights for thinking about physical health, there has not been a review of social capital and physical health (including health behaviors) focused on the developing country context.

Social capital is of particular importance to physical health in developing countries because of their lack of human and economic capital. Specifically, the 48 countries that are currently classified as the least developed countries (LDCs) by the United Nations have great potential to benefit from the various forms of social capital due to their low income, weak human resources, and high economic vulnerability (United Nations, 2011). This paper aims to: (1) provide a critical review of studies examining the association between social capital and physical

health in the LDCs and (2) suggest future research directions for social capital and health in the developing world.

The concept of social capital was originally developed by two renowned sociologists, James Coleman and Pierre Bourdieu. Coleman emphasized the trustworthiness of the social environment, which gave rise to three mechanisms through which social capital is generated: reciprocity exchanges, privileged access to information, and group enforcement of norms (Coleman, 1988). These mechanisms function as group attributes that allow the individual to achieve his or her interests within a network. Coleman also discussed the negative aspects of social capital, which could limit innovation when an individual adheres to group norms.

Bourdieu (1986) developed the idea of social capital in the context of thinking about how social inequalities reproduce themselves in society. He made a clear distinction between two elements of social capital: (1) the social relationships within the network that the individual can draw upon to access resources and (2) the amount and type(s) of resources possessed by individuals in the network (Bourdieu, 1986). In contrast to other definitions of social capital, there is a deliberate emphasis on the content of the resources accessible to individuals within the network. This emphasis creates the potential for negative aspects of social capital as well, namely through the exclusion of specific individuals from accessing resources within a network (Bourdieu, 1986; Carpiano, 2006).

Although Coleman and Bourdieu advanced the theory of social capital, political scientist Robert Putnam popularized it with his work in Italy and the United States. Putnam (1993) suggested that when individuals develop connections with one another, these relationships help develop positive behaviors and attitudes that benefit society. These positive collective attributes include interpersonal trust, civic engagement, and norms of reciprocity. Unlike Coleman and

Bourdieu, Putnam has been criticized for not paying attention to the negative aspects of social capital (Portes, 1998). Nonetheless, Putnam's collective conceptualization of social capital has dominated the way in which this sociological construct has been translated into public health research (Moore et al., 2005).

In order to better understand the differences between the various conceptualizations of social capital, there has been an effort to categorize the theories mentioned above based on (1) whether social capital is an individual or a collective attribute (Kawachi, 2008; Portes, 2000), (2) whether it is empirically measured as structural or cognitive social capital (Harpham, 2008), and (3) whether it is composed of bonding, bridging, or linking social ties (Szreter & Woolcock, 2004).

First, Bourdieu focused on individuals or small groups as the units of analysis with the benefits of social capital accruing to individuals or families through their connections with others (Portes, 2000). According to this framework, social capital is seen as an individual attribute that is measured as a resource that individuals can access through their social networks (Kawachi et al., 2008). By contrast, Coleman and Putnam extend the concept of social capital to families, communities, and even nations (Portes, 2000). According to this framework, social capital is seen as a collective attribute, where the amount of social capital in a community has the potential to benefit the community as a whole (Carpiano, 2006). Most agree that individual and collective social capital should both be measured because they have been found to have different associations with health (Harpham, 2008); however, a recent review of the literature shows that associations at the individual level are stronger compared to associations between health and the same indicator measured at the collective level (Kim et al., 2008). Distinguishing between these

two conceptualizations of social capital is also important because they require the selection of different study designs and analytical techniques.

Second, it is important to differentiate between structural and cognitive forms of social capital because they have been shown to affect health outcomes in different ways (De Silva & Harpham, 2007). Structural social capital assesses what people *do* and is often objectively verified by measuring individuals' actions and behaviors (e.g., group membership and civic participation). Cognitive social capital assesses what people *feel* and is often subjectively verified by measuring individuals' attitudes and perceptions (e.g., social trust, reciprocity, and effective norms). To date, evidence suggests that there are stronger associations between health and trust (cognitive social capital) compared to associational membership (structural social capital) (Kim et al., 2008). These two different forms of social capital should continue to be measured together because they both contribute to the understanding of social capital.

Third, a distinction has been made between different types of social ties: bonding, bridging, and linking (Szreter & Woolcock, 2004). Bonding capital refers to strong ties to family and friends resulting in a densely knit social network, where individuals are alike in terms of their social identity (e.g., race, class, age, place of residence). Bridging capital, by contrast, refers to weak ties to acquaintances, where there is little social involvement between people who are typically not alike in terms of their social identity. Linking capital is a type of bridging capital where the relationship not only cuts across socio-demographic differences, but the individuals also differ with respect to power and authority gradients in society (Szreter & Woolcock, 2004). The distinction between these types of social ties also allows for the examination of negative outcomes within close knit communities with high levels of bonding

capital, which can restrict individual freedom and promote the intolerance of diversity (Portes, 1998).

Although the theoretical conceptualization of social capital remains contested (Szreter & Woolcock, 2004), there has been evidence of the consistent use of specific components of social capital across a variety of studies (Kawachi et al., 2008; van Deth, 2003). This review proposes that social capital is an important construct to explore in global public health because (1) it has been linked to lower levels of mortality and better self-rated health (Kim et al., 2008); (2) it can provide a theoretical basis for assessing the impact of community-based health promotion programs (Murayama et al., 2012); and (3) it can be used by the poor as a primary means of protection against risk and vulnerability (Carroll, 2001).

Methods

Search strategy and selection criteria

This review includes all studies in English that explored the concept of social capital in the LDCs. Citations were searched using three databases for the period between January 1, 1990 and June 1, 2011: PubMed, Web of Science, and POPLINE. All searches included the keyword "social capital" in the title or abstract combined with the name of each of the 48 LDCs. Consistent with the search procedure used by Kim and colleagues (2008), other terms that are similar to social capital by definition—"social cohesion", "social support", and "social networks"—were not included in this search because I was interested in how the developing world conceptualized and applied the term "social capital" in research related to health and health behaviors. The search was limited to the LDCs because they are a clearly defined set of

countries that represent the poorest and weakest segment of the international community (United Nations, 2011).

According to the initial PubMed search, only 44 of the 1,065 articles on social capital (4.1%) were set in one of the 48 LDCs. The citations search from Web of Science and POPLINE contributed an additional 53 articles, for a total of 92 articles. Each article identified was evaluated for inclusion in the review based on the following criteria: (1) the study was empirical in nature, (2) the outcome of interest was related to physical health or health behaviors (studies focused on mental health were excluded from this review), and (3) the study attempted to measure social capital. Based on this set of criteria, 14 studies were reviewed.

Results

General study characteristics

From each study, I abstracted the study authors and year of publication; sample size and country/setting; analytic strategy (qualitative, multivariate regression, or multilevel analysis); conceptual framework (implicit or explicit application of individual/collective, structural/cognitive, or bonding/bridging/linking forms of social capital); measures of social capital and health/health behavior and the construct validity for those measures (weak, intermediate, or strong); factors included as covariates in statistical models; and individual- and area-level effect estimates for social capital. The latter two factors were not abstracted from the qualitative studies because statistical models with covariates and effect estimates were not used. Due to the lack of standardized measures of social capital, the assessment of construct validity was based on the congruence between the variable(s) used to measure social capital and the conceptual framework (or lack thereof) applied to the study. Of the 14 studies reviewed, 12 were

set in Africa (11 in East and Central Africa; one in West Africa) and two were set in South Asia (both in Bangladesh). All used cross-sectional study designs, 11 of which collected primary data. Ten studies assessed individual-level social capital and two studies assessed social capital as a collective attribute (the other two studies were not clear about the level of attribution). Only seven studies made explicit reference to structural/cognitive or bonding/bridging/linking social capital. The analytic methods included five qualitative and nine quantitative studies, one of which used a multilevel approach. Of the nine quantitative studies, all attempted to contextualize the measurement of social capital; however, only two mentioned the validation of the social capital survey instrument. Tables 2.1 and 2.2 display the key characteristics and findings stratified by the health outcome from the quantitative and qualitative studies, respectively.

Sexual health

Of the 14 studies reviewed, six of the studies addressed the topic of sexual health. Five of the six studies used regression analysis to determine the association between social capital and sexual health behaviors. Agardh and colleagues (2010) explored the relationship between social capital and sexual behavior among university students in Mbarara, Uganda. The study focused on distinguishing between trust with people who have a close relationship with the respondent (bonding capital) and trust with people who have a different background than the respondent (bridging capital). They found that individuals with low levels of bonding capital were less likely to always use a condom with a new sexual partner and individuals with low levels of bridging capital were more likely to have a high number of lifetime sexual partners.

Erulkar and Ferede (2009) examined the effect of social exclusion (lack of social capital) on sexual debut among out-of-school females in three poor, urban areas of Ethiopia. The authors

defined social exclusion by the number of friends each respondent had, the level of social support from the community, and social participation in community groups or clubs. They found that the odds of a female's first sexual encounter being coerced were two times greater for females who were socially excluded compared to those who were not excluded.

Paek and colleagues (2008) applied a multilevel model to examine the effect of social capital on the use of family planning methods in Uganda. Measures of cognitive social capital (e.g., trust, social cohesion, reciprocity, social norms) were used at both the individual and village level. The findings revealed that individual-level social capital was not a significant predictor of family planning behavior. At the contextual level, social capital had a negative, but nonsignificant, effect on family planning behaviors after cross-level interactions were included in the model.

Djamba (2003) studied the association between household-level social capital and individual sexual behaviors in the Democratic Republic of Congo. He derived his conceptual framework from Coleman's model of social capital (Coleman, 1988) and found that the number of children in a household (the indicator used to measure social capital) was positively correlated with the initiation of premarital sexual activity. In a prior study by Djamba (1997), which was set in Zambia, he found that the same measure of household-level social capital was not associated with premarital sexual activity.

In the only qualitative study on sexual health, Larsen (2010) examined the cultural practice of labia elongation—the extension of the labia during the first signs of puberty—as a mechanism through which social capital was created in Rwanda. She suggested that the harmful cultural practice of labia elongation increased social capital by enforcing social norms (cognitive social capital) and strengthening social ties within the community (bonding capital). This type of

social capital had the potential to lead to negative consequences as well, such as socially isolating females who refuse to or are unable to take part in labia elongation.

HIV and other infectious diseases

There were three studies related to HIV treatment and support and one study related to the treatment of diarrheal disease. All four studies used qualitative methods to explore the relationship between social capital and these outcomes. Using grounded theory to develop their theoretical model, Frumence and colleagues (2011) studied how structural and cognitive forms of social capital (e.g., group membership, trust, and social norms) may have influenced the progression of the HIV epidemic in three villages of Tanzania. Although it was unclear whether the study defined social capital as an individual or collective attribute, they found that all aspects of social capital protected against HIV infection by expanding access to formal and informal networks and empowering vulnerable groups to practice safer sexual behaviors.

In a prior study, Frumence and colleagues (2010) examined the relationship between social capital and HIV prevalence using the same measures of social capital in the same three villages in Tanzania. They discovered that both cognitive and structural social capital were more pronounced in villages with high and medium HIV prevalence rates, compared to the village with low HIV prevalence rates.

Ware and colleagues (2009) examined the relationship between social capital and adherence to anti-retroviral treatment (ART) in three public HIV-treatment settings in Nigeria, Tanzania, and Uganda. They found that an individual's social relationships were a "critical resource" for supporting adherence to antiretroviral treatment and managing economic hardship through overcoming stigma related to HIV as well as accessing resources to improve adherence.

Edgeworth and Collins (2006) explored the role of social capital in assisting individuals and households during times of self-care treatment of diarrheal disease in rural Bangladesh. This study suggested that self-care treatment of diarrheal disease was successful when an individual had access to social and human capital assets, including health information, social support, and resources, such as oral rehydration solution.

Maternal and child health

The two studies that addressed the topic of maternal and child health focused on child nutrition status and child mortality. De Silva and Harpham (2007) examined the association between maternal social capital (structural and cognitive) and child nutritional status in four developing countries: Peru, Ethiopia, Vietnam, and India (only data from Ethiopia was considered in this review). The study showed that women in Ethiopia had high levels of group membership, high participation in citizenship activities, and high levels of cognitive social capital. However, only cognitive social capital was significantly associated with both higher height-for-age and weight-for-age *z*-scores among their children.

Fantahun and colleagues (2007) studied the relationship between mothers' and caretakers' social capital (e.g., group membership and trust) and child mortality Ethiopia. The authors claimed that low individual social capital scores were related to high child mortality; however, the selection of referent cases during data collection and the inclusion of all significant bivariate associations in the final regression model made it difficult to interpret the findings related to social capital and child mortality.

Self-rated health

Two studies addressed the topic of self-rated health. Nilsson and colleagues (2006) investigated the association between social capital and self-rated quality of life among older adults in rural Bangladesh. Although the authors distinguished between individual-level social capital and community-level social capital, both forms of social capital were measured at the individual level. The study showed that lower levels of individual social capital (e.g., social relationships) and lower levels of community social capital (e.g., civic participation) were significantly associated with poorer quality of life.

Sirven (2006) examined social capital (e.g., group participation and collective action) as a mediating factor in the pathway between the affect of income on self-rated health in rural Madagascar. This study utilized sophisticated analytic methods to analyze the individual effect of social capital on health and its mediating effect in the income-health causal pathway. Both endogenous (predicted by wealth of household) and exogenous forms of social capital were found to have significant effects on improved self-rated health.

Discussion

Although research on the relationship between social capital and health has grown in recent years, there is a dearth of evidence from the developing world. The literature reviewed above suggests that social capital is a construct that can be applied across cultural contexts and has the potential to improve health in resource-poor settings. However, it is difficult to make decisive conclusions about the relationship between social capital and health due to the different types of indicators used to assess social capital, the variability in the quality of the social capital measures, and the analytic methods used in each study. The first two studies related to sexual health revealed significant associations between the lack of social capital (as measured by

individuals' relationships with peers) and risky sexual behaviors (Agardh et al., 2010; Erulkar and Ferede, 2009), suggesting that social exclusion is associated with risky sexual behaviors. However, due to the use of cross sectional study designs, it is possible that the directions of the associations are reversed, such that the practice of risky sexual behaviors led to social isolation. The latter three studies on sexual health used drastically different measures to assess social capital and showed mixed results. Paek and colleagues (2008) did not find a significant association with measures of cognitive social capital as defined by Putnam (1993), whereas Djamba found a marginal association with Coleman's (1988) definition of social capital in one study (Djamba, 2003), but no significant relationship in the other study (Djamba, 1997). All of the studies related to HIV and other infectious diseases were qualitative in nature (Frumence et al., 2010; Frumence et al., 2011; Ware et al., 2009; Edgeworth & Collins, 2006). Although these studies each assessed social capital in a unique way, they all revealed that participation in social groups were associated with lower HIV prevalence and compliance with treatment. The direction of the association in the HIV prevalence studies suggested that the increase in HIV led to an increase in social capital, where social organizations were created in high HIV prevalence communities in order to cope with the effects of the epidemic (Frumence et al., 2010).

The strongest and most consistent associations between various measures of social capital and health come from studies that examined health outcomes rather than health behaviors. Measures of cognitive social capital were associated with increases in child nutrition status (De Silva & Harpham, 2007) and decreases in child mortality (Fantahun et al., 2007). Improvements in self-rated health (Nilsson et al., 2006; Sirven, 2006) were each significantly associated with higher levels of cognitive and structural social capital, including social relationships with friends and neighbors, membership in community organizations, involvement in social networks, and

collective actions. It is difficult to infer the direction of the association in the studies that examined child mortality (Fantahun et al., 2007) and quality of life (Nilsson et al., 2006). For example, the death of a child may result in depression and social isolation, whereas poor quality of life may inhibit the ability of individuals to develop social relationships. Although the studies reviewed in this paper distinguish between the health effects of different forms of social capital, more research is needed in order to determine the best measures for social capital and to elucidate the mechanisms through which social capital affects health in each setting.

Study limitations

There were limitations to both the systematic review and the studies included in the review. First, the results of this review only used the term "social capital" as part if the search strategy. If the search had included articles that used different terminology to describe social capital, then the literature search may have yielded a different group of studies. Second, this review had difficulty comparing the effects of social capital across studies because different indicators were used to assess social capital in each study. Third, there was only one reviewer of the full articles included in this review. Therefore, alternative interpretations of the results may have been excluded.

There were three major limitations to the studies included in this review that used quantitative methods. First, all of the studies used retrospective, cross-sectional data, which limited their ability to make causal inferences about the association between social capital and health. Second, the indicators used to measure social capital were different for each researcher and only two of the studies validated the measure of social capital using psychometric methods (De Silva & Harpham, 2007; Fantahun et al., 2007). This further complicates the ability to make

comparisons about social capital across studies and supports the claim that there is a lack of consensus about the measurement of social capital (Harpham, 2008). Third, social capital is often conceptualized as a collective attribute that should be measured at the aggregate level (Harpham, 2008); however, only two studies explicitly measured social capital at the contextual, or aggregate, level (Paek et al., 2008; Frumence et al., 2010).

Finally, there were two primary limitations to the studies that used qualitative data and purposive sampling. First, the results of these studies were not generalizable to any other setting due to the non-random selection of study participants. Second, the retrospective nature of each study limited the potential to make causal inferences about the relationship between social capital and health. In and of itself, qualitative research should not be dismissed as an appropriate methodology when studying social capital and health. Qualitative methods provide in-depth insights into potential mechanisms of action and improve internal validity (for a particular context) at the expense of limited external validity to other contexts.

Future research implications

In order to help overcome the limitations of the existing research and set a future global agenda for research on social capital and health in the developing world, three research priorities need to be addressed.

(1) Examine the theoretical conceptualization and operationalization of social capital in the developing country context.

Throughout the studies included in this review, the construct of social capital was examined consistently across a variety of cultural contexts. Of the different conceptualizations

presented, the most appropriate theoretical conceptualization of social capital in the developing world draws upon concepts introduced in the development literature, namely bonding, bridging, and linking social capital (Szreter & Woolcock, 2004). First, in many developing countries, strong intra-community ties (bonding capital) can lead to conformity to traditional norms and restrict individual freedom (Portes, 1998). This is especially true among certain ethnic and religious groups, where behavioral norms can discourage the use of health care (Islam et al., 2006). On the other hand, bonding relationships can promote the use of health services by generating resources from close family and friends. It is important to understand the behavioral norms and resources embedded within these bonding relationships in order to accurately assess the association between social capital and health.

Second, diverse, inter-community networks (bridging capital) can give individuals in developing countries better access to resources and information, as well as more opportunities to voice their claims and negotiate support (Carroll, 2001; Harpham et al., 2002). This is especially true for marginalized individuals who can benefit from opportunities to associate with individuals from different socioeconomic and cultural backgrounds. Therefore, individuals with greater access to bridging relationships are more likely to have the necessary knowledge and resources to practice healthy behaviors.

Third, a form of bridging social capital that connects people across explicit power gradients in society is called linking capital (Szreter & Woolcock, 2004). Relationships between communities (or community members) and representatives of formal institutions such as health care providers, teachers and government officers can help leverage resources, ideas, and information, especially in poor communities (Woolcock, 2001). This form of social capital has the greatest potential to not only improve health in the developing world, but to reduce

disparities in health and health care. Future research in the developing world should consider using the bonding, bridging, and linking social capital framework to conceptualize social capital as well as creating reliable operational measures of these forms of social capital that can be compared across time and context.

(2) Adapt and validate social capital assessment tools for the developing country context.

Most generic survey instruments used to measure social capital are not validated in different cultural settings. Given that the same question about social capital may be interpreted differently in different cultural settings, there is a need to validate social capital survey instruments in each new setting. De Silva and colleagues (2006) adapted the Social Capital Assessment Tool for four developing countries using psychometric methods, such as factors analysis, and cognitive interviewing. However, this is the only known example of an instrument that has been adapted and validated for use in developing countries. They implore future research to continue to validate the social capital survey instruments in different cultural settings.

There is also a need to continue to search for "valid, directly observable, collective, ecologic indicators" of social capital (Harpham, 2008). These types of indicators, also known as integral variables, differ from derived variables (another type of group-level variable) in that they are not aggregate measures of the characteristics of individuals in the group (Diez-Roux, 2002). Examples of integral variables include the existence of certain laws, population density, or certain characteristics of the infrastructure. Very few studies have attempted to measure integral variables that accurately represent social capital. It is important to continue to develop instruments that measure aspects of social capital that are relevant to the developing country

context (at the individual and community level) as well as validate the instruments that are already in use.

(3) Design sampling strategies to account for the multilevel effect of social capital on health.

In order to account for the contextual impact of social capital on individual health behaviors and health outcomes, the study of social capital in public health typically uses a multilevel framework (Carpiano, 2006; Kawachi et al., 2008). This model-based approach provides two advantages over a traditional design-based approach: (1) it allows the researcher to demonstrate whether social capital has an independent contextual effect on individual health outcomes, over and above the characteristics of individuals belonging to the social group; and (2) it allows researchers to test for cross-level interactions between community-level social capital and individual characteristics, such as socioeconomic status and ethnicity (Kawachi et al., 2008). Multilevel analysis of social capital is directly applicable to developing countries; however, very few data sets exist in the developing world with this level of information. There is a need to design multilevel sampling strategies to analyze collective attributes, like social capital.

Conclusion

Population health in the developing world has the potential to benefit from efforts to improve social capital. This includes access to appropriate resources and the capability to benefit from those resources through social relationships within and between communities and organizations (Szreter & Woolcock, 2004). In order to influence social policy to increase access to health resources and improve population health, it is imperative to build an evidence-base for the effect of social capital on health in the developing countries, especially among marginalized

and vulnerable populations. Future research on social capital and health in the developing world should focus on applying theoretical conceptualizations of social capital that can be compared across contexts in the developing world, adapting and validating instruments for measuring social capital, and designing sampling strategies to collect multilevel data on social capital in developing countries.

References

Agardh, A., Emmelin, M., Muriisa, R., Ostergren, P.O., 2010. Social capital and sexual behavior among Ugandan university students. *Global Health Action,* 3.

Bourdieu, P., 1986. The forms of capital. *In*: J. G. Richardson, ed., *Handbook of theory and research for the sociology of education*. New York: Greenwood Press, 241-258.

Carroll, T.F., 2001. Social capital, local capacity building and poverty reduction. Social Development Papers No. 3, Office of Environmental and Social Development, Asian Development Bank.

Carpiano, R.M., 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62(1), 165-175.

Coleman, J. S., 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94(Suppl.), S95-S120.

De Silva, M.J., McKenzie, K., Harpham, T., Huttly SR., 2005. Social capital and mental illness: A systematic review. *Journal of Epidemiology and Community Health*, 59, 619-627.

De Silva M.J., Harpham T., Tuan T., Bartolini R., Penny M.E., Huttly S.R., 2006. Psychometric and cognitive validation of a social capital measurement tool in Peru and Vietnam. *Social Science and Medicine*, 62(4), 941-953.

De Silva, M.J. and Harpham, T., 2007. Maternal social capital and child nutritional status in four developing countries. *Health and Place*, 13(2), 341-355.

Diez-Roux, A.V., 2002. A glossary for multilevel analysis. *Journal of Epidemiology and Community Health*, 56(8), 588-594.

Djamba YK., 1997. Financial capital and premarital sexual activity in Africa: The case of Zambia. *Population Research and Policy Review*, 16(3), 243-57.

Djamba, Y.K., 2003. Social capital and premarital sexual activity in Africa: The case of Kinshasa, Democratic Republic of Congo. *Archives of Sexual Behavior*, 32(4), 327-37.

Edgeworth. R. and Collins, A.E., 2006. Self-care as a response to diarrhea in rural Bangladesh: Empowered choice or enforced adoption? *Social Science and Medicine*, 63(10), 2686-2697.

Erulkar, A. and Ferede, A., 2009. Social exclusion and early or unwanted sexual initiation among poor urban females in Ethiopia. *International Perspectives on Sexual and Reproductive Health*, 35(4), 186-193.

Fantahun, M., Berhane, Y., Wall, S., Byass, P., Högberg, U., 2007. Women's involvement in household decision-making and strengthening social capital—crucial factors for child survival in Ethiopia. *Acta Paediatrica*, 96(4), 582-589.

Frumence, G., Killewo, J., Kwesigabo, G., Nyström, L., Eriksson, M., Emmelin, M., 2010. Social capital and the decline in HIV transmission: A case study in three villages in the Kagera region of Tanzania. *Journal des Aspects Sociaux du VIH/SIDA*, 7(3), 9-20.

Frumence G, Eriksson M, Nyström L, Killewo J, Emmelin, M., 2011. Exploring the role of cognitive and structural forms of social capital in HIV/AIDS trends in the Kagera region of Tanzania – A grounded theory study. *African Journal of AIDS Research*, 10(1), 1-13.

Harpham, T., Grant, E., and Thomas, E., 2002. Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17(1), 106–111.

Harpham, T., 2008. The measurement of community social capital through surveys. *In*: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*. New York, NY: Springer, 51-62.

Kawachi, I., 2010. Social capital and health. *In*: Bird, C., Conrad, P., Fremont, A.M., and Timmermans, S. (Eds), *Handbook of Medical Sociology, 6th Edition*, Nashville: Vanderbilt University Press, 18-32.

Kawachi, I., Subramanian, S.V., Kim, D., 2008. Social capital and health: A decade of progress and beyond. *In*: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY: Springer, 1-26.

Kim, D., Subramanian, S.V., Kawachi I., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim, D. (Eds), *Social Capital and Health*, New York, NY: Springer, 139-190.

Larsen, J., 2010. The social vagina: Labia elongation and social capital among women in Rwanda. *Culture, Health and Sexuality*, 12(7), 813-826.

Moore, S., Shiell, A., Hawe, P., Haines, V.A., 2005. The privileging of communitarian ideas: citation practices and the translation of social capital into public health. *American Journal of Public Health*, 95(8), 1330-1337.

Murayama, H., Fujiwara, Y., Kawachi, I., 2012. Social capital and health: A review of prospective multilevel studies. *Journal of Epidemiology*, 22(3), 179-187.

Nilsson, J., Rana, A.K., Kabir, Z.N., 2006. Social capital and quality of life in old age: Results from a cross-sectional study in rural Bangladesh. *Journal of Aging and Health*, 18(3), 419-434.

Paek, H.J., Lee, B., Salmon, C.T., Witte, K., 2008. The contextual effects of gender norms, communication, and social capital on family planning behaviors in Uganda: A multilevel approach. *Health Education and Behavior*, 35(4), 461-477.

Portes, A., 2000. The two meanings of social capital. *Sociological Forum*, 15 (1), 1-12.

Portes, A., 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24(1), 1-24.

Putnam, R.D., 1993. The prosperous community: Social capital and public life. *The American Prospect*, 38.

Sirven, N., 2006. Endogenous social capital and self-rated health: Cross-sectional data from rural areas of Madagascar. *Social Science and Medicine*, 63(6), 1489-1502.

Szreter, S. and Woolcock, M., 2004. Health by association? Social capital, social theory and the political economy of public health. *International Journal of Epidemiology*, 33, 650-667.

United Nations, 2011. *World Statistics Pocketbook 2010: Least Developed Countries*. New York: United Nations.

Wakefield, S.E. and Poland, B., 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60, 2819-2832.

Ware, N.C., Idoko, J., Kaaya, S., Biraro, I.A., Wyatt, M.A., Agbaji, O., Chalamilla, G., Bangsberg, D.R., 2009. Explaining adherence success in sub-Saharan Africa: An ethnographic study. *PLoS Medicine*, 6(1), e11.

Woolcock, M., 2001. The place of social capital in understanding social and economic outcomes. *Isuma Canadian Journal of Policy Research*, 2, 11-17.

Table 2.1. Quantitative Empirical Studies on Social Capital, Health, and Health Behaviors in the Least Developed Countries

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Covariates	Estimates for social capital
Sexual Health							
Agardh et al., 2010	Uganda, 980 college students	Multivariate logistic regression	Individual attribute; explicit application of bonding and bridging forms of social capital	Trust in others (4-item score), bridging trust (5-item score), social participation; Construct validity: Intermediate	Previously had sex, number of lifetime sexual partners, condom use with new partner	Area of origin, educational level of household head, the role of religion in the family, age, sex	*1) Trust in others:* Previously had sex: OR = 1.0 High # of sexual partners: OR = 1.0 Did not always use condom: OR = 1.6* *2) Bridging trust:* Previously had sex: OR = 1.1 High # of sexual partners: OR = 1.8* Did not always use condom: OR = 1.0
Erulkar & Ferede, 2009	Ethiopia, 1,837 out-of-school females aged 10-19	Multivariate logistic regression	Individual attribute; implicit application of bonding and cognitive social capital	Social exclusion (3-item score: no friends, no community support, no group participation); Construct validity: Intermediate	Sexual initiation before age 15, non-consensual sexual debut	Education, orphanhood status, marital status, alcohol use, migrant status, being a domestic worker	*1) Social exclusion:* Sexual initiation<15: OR = 1.10 Coerced sexual initiation: OR = 1.99*

* $p < 0.05$

(Continued)

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Covariates	Estimates for social capital
Sexual Health (continued)							
Paek et al., 2008	Uganda, 350 adults over age 18	Multilevel regression	Individual and collective attribute; implicit application of cognitive social capital	*Individual level:* Social capital (6-item score: cohesion, trust, informal social control, reciprocity, enforcement of norms, social participation) *Village level:* Aggregate of individual-level score; Construct validity: Strong	*Individual level:* Current use of a family planning method	*Individual level:* Age, gender, education level, religion, number of living children, perceived barriers to FP, perceived benefits of FP, self-efficacy, gender norms, exposure to health-related radio programs, interpersonal communication *Village level:* Gender norms, exposure to health-related radio programs, interpersonal communication	*1) Social capital (individual-level):* FP behavior: $\beta = 0.05$ *2) Social capital (village-level):* FP behavior: $\beta = -0.42$
Djamba, 2003	Democratic Republic of Congo, 2,000 women aged 14-24	Multivariate analysis using discrete-time event-history procedure	Individual attribute; implicit application of cognitive social capital	Number of household members from age 0 to respondent's age; Construct validity: Weak	Premarital sexual activity	Age, education, religion, religiosity, self-esteem, kinship, ethnicity, financial capital, human capital, residence, exposure to media, contraceptive and AIDS knowledge	*1) No. of household members:* Premarital sex: $\beta = 0.08$*

* $p < 0.05$

(Continued)

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Covariates	Estimates for social capital
Sexual Health (continued)							
Djamba, 1997	Zambia, 1379 never-married teenagers 15-19 years of age	Multivariate logistic regression	Individual attribute; implicit application cognitive social capital	The number of all children, 0-19 years of age; Construct validity: Weak	Premarital sexual activity	Age, education, religion, residence, media exposure, financial capital, human capital.	*1) 3–6 children:* Premarital sex: β = –0.07 *2) 7+ children:* Premarital sex: β = 0.18
Maternal and Child Health							
De Silva & Harpham, 2007	Ethiopia, 1,756 mothers of 1-year-old children	Multiple linear regression	Individual attribute; explicit application of cognitive and structural social capital	Structural social capital (membership of groups, civic involvement, social support), cognitive social capital (trust, social harmony, perceived fairness, sense of belonging); Construct validity: Strong	Child nutrition status (height-for-age z-score, weight-for-age z-score)	*Child factors:* Sex, age, breastfeeding practice *Maternal factors:* Education level, age, marital status, religion, ethnicity, # of occupational activities, SES status *Household factors:* Poverty group, household composition *Contextual factors:* Place of residence	*1) Member of 2+ community groups:* Height-for-age: β = –.08 Weight-for-age: β = .12 *2) Talked and joined citizenship activities:* Height-for-age: β = .21 Weight-for-age: β = .07 *3) Support from 2+ individuals:* Height-for-age: β = .26* Weight-for-age: β = –.05 *4) Cognitive social capital:* Height-for-age: β = .27* Weight-for-age: β = .24*

* $p < 0.05$

(Continued)

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Covariates	Estimates for social capital
Maternal and Child Health (continued)							
Fantahun et al., 2007	Ethiopia, 209 under-5 deaths and 647 referents	Conditional logistic regression	Individual attribute; implicit application of cognitive social capital	Social capital (5-item score: ability to borrow money, membership of the *Kebele* leadership, membership of community organizations, trusting people, thinking that people can hurt); Construct validity: Intermediate	Child mortality	Household economic status, household decision-making, maternal age, maternal literacy, number of pregnancies, absence of windows in house, immunization status	*1) Social capital score:* Under-5 child mortality: OR = 1.9*
Self-Rated Health							
Nilsson et al., 2006	Bangladesh, 1,031 elderly persons aged ≥ 60	Multivariate logistic regression	Individual attribute; implicit application of structural social capital	Individual level (4-item score: daily contact with children, household decision-making, visits neighbors, spends time with friends), community level (2-item score: community organization membership, voted in last election); Construct validity: Weak	Self-rated quality of life	Age, marital status, household economic status, education	*1) Individual-level social capital:* Quality of life: OR = 1.7* *2) Community-level social capital:* Quality of life: OR = 1.9*

* $p < 0.05$

(Continued)

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Covariates	Estimates for social capital
Self-Rated Health (continued)							
Sirven, 2006	Madagascar, 587 households	Probit models controlling for endogeneity	Individual attribute; implicit application of cognitive and structural social capital and explicit application of bonding social capital	Associations, collective actions, network involvement, traditional ceremonies; Construct validity: Strong	Self-rated health	Income, health (total expenditures dedicated to health, water quality, latrine quality), gender, age, education, household size, place of residence	*1) Associations:* Self-rated health: ME = .167 *2) Collective action:* Self-rated health: ME = .420* *3) Ceremony:* Self-rated health: ME = .426 *4) Network:* Self-rated health: ME = .416*

* $p < 0.05$

Table 2.2. Qualitative Empirical Studies on Social Capital, Health, and Health Behaviors in the Least Developed Countries

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Description of social capital findings
Sexual Health						
Larsen, 2010	Rwanda, 56 people (doctors, men, women)	Qualitative analysis of individual interviews and focus group discussions	Level of attribution unclear; explicit application of bonding and cognitive social capital	Dissemination of information, enforcement of social norms, social support, reciprocity exchanges; Construct validity: Strong	Labia elongation, general sexual health	"The networks, reciprocities and trust that arise from the highly communal act [of labia elongation] amounts to social capital" (p.823).
HIV and Other Infectious Diseases						
Frumence et al., 2011	Tanzania, 3 cases (villages), consisting of 29 key informant interviews and 120 participants	Case study analysis of key informant interviews and focus group discussions	Level of attribution unclear; explicit application of structural and cognitive forms of social capital	Structural social capital (the needs of vulnerable groups being served, new opportunities for participation created, increased enrolment by women) and cognitive social capital (formalized membership rules, strict conduct fostered, religious norms and values); Construct validity: Strong	Sexual behavior changes (number of sexual partners, frequency of casual sex, abstinence until marriage among youth, demand for condom use)	"… structural and cognitive social capital contributed to changes in behavior, specifically the number of sexual partners, instances of casual sex, abstinence until marriage among youth, and demands for condom use" (p. 8).

(Continued)

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures & construct validity	Health/health behavior measures	Description of social capital findings
HIV and Other Infectious Diseases (continued)						
Frumence et al., 2010	Tanzania, 3 cases (villages) consisting of 29 key informants, 120 community members	Case study analysis of key informant interviews and focus group discussions	Collective attribute; explicit application of cognitive, structural and bonding, bridging, and linking social capital	Structural social capital (including bonding, bridging, and linking), cognitive social capital; Construct validity: Strong	HIV prevalence	"People's participation in social groups (structural social capital) and the rules, values, norms, trust, and solidarity (cognitive social capital) that were developed by these groups influenced HIV transmission through changing risk behavior" (p. 19).
Ware et al., 2009	Nigeria, Tanzania, Uganda; 158 AIDS patients, 45 treatment partners, 49 healthcare providers	Ethnographic methods using category construction from individual interviews	Individual attribute; implicit application of structural social capital	Resources from social networks; Construct validity: Weak	Adherence to ART	"A more complete explanation [for ART adherence] highlights the role of social capital in relationships as a resource for prioritizing adherence and overcoming economic obstacles to care" (p. 0046).
Edgeworth & Collins, 2006	Bangladesh, 208 adults	Qualitative analysis of structured questionnaires, semi-structured interviews and focus group discussions	Individual attribute; implicit application of cognitive and structural social capital.	NGO membership, household relations, village networks; Construct validity: Intermediate	Self-care for diarrheal disease	"Findings from this study reinforce the idea that widespread diffusion of preventive and basic curative health messages through NGO and Government of Bangladesh health personnel, and regular interaction with CHWs has served to increase households' capacity to recognize, diagnose and undertake appropriate forms of treatment in response to diarrhea" (p. 2693).

Chapter 3

A Cognitive Approach to Validating the Measurement of Social Capital in Bangladesh

Chapter Abstract

Despite the growing evidence linking social capital to improvements in health and development, there are differing opinions about the usefulness of social capital as a theoretical construct. This is due, in part, to the lack of reliable measures of social capital that have been validated over a number of years in multiple settings. In addition, most generic survey instruments used to measure social capital are not validated in different cultural contexts. Given that the same question about social capital may be interpreted differently in different cultural settings, there is a need to evaluate social capital survey questions in each new setting. To date, no social capital survey instrument has been cognitively tested in Bangladesh, a country that has the potential to benefit from social capital due to limited human capital and high economic vulnerability. The primary objective of this paper is to examine the content validity of the measurement of social capital used in the shortened and adapted Social Capital Assessment Tool (SASCAT) in Bangladesh using qualitative methods, including focus group discussions and cognitive interviewing techniques. The study took place in one rural sub-district (Durgapur) and one urban slum (Mirpur) in Bangladesh. Four interviewers conducted a total of four focus group discussions and 32 cognitive interviews in Bengali. The findings from the expert reviews, focus

groups discussions, and cognitive interviews were used to create a newly adapted social capital survey instrument that can be used by health and development organizations in Bangladesh. As efforts to accurately and reliably measure social capital continue to improve, the relationship between social capital and health will be better understood.

Introduction

Over the last 20 years social capital has become one of the most popular concepts from sociology to be applied to public health. Research on social capital has shown associations with physical health (Kim et al., 2008), mental health (De Silva et al., 2005), and a variety of development outcomes (Carroll, 2001; Grootaert & van Bastelaer, 2001). Despite the growing evidence linking social capital to improvements in health and development, it has become one of the most contested concepts in the social sciences (Kawachi et al., 2008; Szreter & Woolcock, 2004). Critics of the recent popularity of the social capital concept claim that it does not contribute any new sociological ideas and that public health researchers have a tendency to combine a variety of different social phenomena under the label of "social capital" (Kawachi et al., 2008; Portes, 1998). On the other hand, social capital has been cited as an interdisciplinary concept that can unite researchers with disparate interests under a common theme (Wakefield & Poland, 2005; Woolcock, 1998). Differing opinions about the usefulness of social capital as a theoretical construct are due, in part, to the lack of reliable measures of social capital that have been validated over a number of years in multiple settings (Blaxter & Poland, 2002; De Silva et al., 2006).

Social capital is an inherently abstract construct that is difficult to translate into operational measures (Narayan & Cassidy, 2001). However, the construct of social capital has

been consistently examined across a variety of contexts (Kawachi et al., 2008; van Deth, 2003), which allows it to be compared across time and context. Social capital is generally defined as the social networks, norms, and values that facilitate collective action for mutual benefit (Woolcock, 1998). Political scientists mainly focus on collective attributes of social capital, such as norms and values (Putnam, 1993), whereas sociologists tend to conceptualize social capital in terms of resources embedded within an individual's social network (Coleman, 1988; Bourdieu, 1986). In order to operationalize the measurement of social capital, one must first unpack social capital theory into its components. Most researchers distinguish between cognitive and structural social capital (Harpham et al., 2002). Cognitive social capital tends to align with the theories of political scientists and focuses on what people feel about their community; it is measured by assessing individuals' attitudes and perceptions. Structural social capital primarily reflects the theories of sociologists and focuses on what people do to gain access to resources; it is measured by assessing individuals' actions and behaviors. These two different forms of social capital should not be seen as mutually exclusive, but as complementary because they both contribute to the understanding of social capital (Harpham et al., 2002; Krishna & Shrader, 2000).

In addition to the reliability of the construct across contexts, there is significant similarity in the measurement of social capital across empirical studies (van Deth, 2003). Components of social capital that are consistent across past surveys include both cognitive and structural measures. The most common components of cognitive social capital are generalized trust, interpersonal trust, and perceived norms of reciprocity (Harpham et al., 2002; Narayan & Cassidy, 2001). Generalized trust is a central dimension of Putnam's conception of social capital and emphasizes the sense of trust one has in their community, including trust in people who are

unknown to them. A community with a generalized sense of trust is thought to be more capable of developing and enforcing positive behaviors and attitudes that benefit society (Putnam, 1993). However, it has been argued that generalized social trust is not only difficult to measure (Blaxter and Poland, 2002), but is irrelevant to the concept of social capital (Cook, 2005; Foley & Edwards, 1999). On the other hand, interpersonal trust is more specific and can be conceptualized in relational terms, where one individual trusts another to perform a particular task (Cook, 2005). This form of trust relates to Coleman's and Bourdieu's concept of social capital in which networks of trustworthy relationships are the dominant mode of social exchange. Norms of reciprocity reflect Coleman's theory of social capital where members of a network help one another and trust that the favor will be returned by the initial recipient of the favor or by other members in the network (Coleman, 1998).

Differing from but connected to the measures of cognitive social capital, the most commonly-used components of structural social capital are associational membership/ involvement; informal connections with family, friends, and neighbors; and social proactivity (Harpham et al., 2002; Narayan & Cassidy, 2001). Membership in a community group or organization provides the opportunity for individuals to socialize and interact with others, which helps foster a sense of community from which all residents can benefit (Carpiano, 2006). Associational membership has been shown to be correlated with economic development in less developed countries (Narayan & Cassidy, 2001). Informal relationships with people who are close to an individual (relationally and geographically) serve as an additional source of support to reduce the impact of negative life events. In some contexts, informal connections with family, friends, and neighbors have been shown to be more important to the conceptualization of social capital than formal associations with organizations (Campbell & Gillies, 2001; Grootaert & van

Bastelaer, 2001). Social proactivity, or collective action, refers to the willingness of individuals to intervene for the common good and depends on cognitive aspects of social capital, such as trust and norms of reciprocity (Kawachi et al., 2008). Proactive individuals have the ability to draw upon resources and respond to community threats as well as engage in sustained collective action to control deviant behaviors in the community.

Although there are consistent conceptualizations of social capital components across surveys, the same questions about social capital may be interpreted differently in different cultural settings. This is not to say that the different components of the construct vary across cultural settings, but that the questions used to measure each component need to be contextualized. Therefore, we need to validate social capital survey questions in each cultural setting in which they are applied (van Deth, 2003; Webber & Huxley, 2007). Both quantitative and qualitative methods can be used to validate survey questions.

The most common quantitative validation technique is psychometric validation, which is relatively common in social capital studies. Psychometric validation techniques, such as factor analysis, are able to distinguish between various theoretical components of a particular construct; however, they do not include the respondents' perspective (De Silva et al., 2006). Failure to examine questions from the respondent's point of view may lead to misinterpretations, falsified answers, missing responses, and offended respondents (Bowden et al., 2002).

A common qualitative validation method—cognitive interviewing—allows us to validate survey instruments from the respondents' perspective by systematically examining the question-and-answer process. Cognitive interviewing focuses on four cognitive tasks required to answer a survey question: interpretation, retrieval/recall of information, judgment formation (sorting through information in order to formulate and identify a response), and response mapping

(deciding which response to report) (Beatty, 2004; Willis, 2005). Results from cognitive interviews are used to develop a contextually relevant survey instrument in which the responses to each question represent "true" values of the concept being measured (Collins, 2003).

Only five other studies have used cognitive interviewing techniques to qualitatively validate social capital survey instruments: three that were set in the UK (Blaxter & Poland, 2002; Boreham, 1999; Earthy et al., 2000) and two others that were set in Vietnam and Peru testing the same instrument (Tuan et al., 2005; De Silva et al., 2006). The studies set in the UK highlighted the importance of understanding the respondents' interpretation of key social capital concepts in different contexts before piloting a large-scale survey. Specifically, they found that the resources available within social networks were more important than the number of people in the networks, individual perceptions of trust and reciprocity cannot be used to infer generalized trust or reciprocity, and respondents rarely mentioned engagement in community activities (Blaxter & Poland, 2002; Earthy et al., 2000). Although the results provided insight about future social capital surveys, they had not been tested outside of the UK.

The studies set in Vietnam and Peru are the only known examples of social capital survey instruments that have been validated for use in developing countries. Both studies used a shortened and adapted version of a social capital survey instrument that was developed by the World Bank, called the Social Capital Assessment Tool (SCAT) (Krishna & Shrader, 2000). The new instrument (the SASCAT) has been used as a component of a larger survey in the Young Lives research project on childhood poverty in four developing countries (Ethiopia, Vietnam, Peru and Andhra Pradesh in India). These two studies provided the primary motivation for the development and validation of a social capital survey instrument in Bangladesh.

To date, no social capital survey instrument has been cognitively tested in Bangladesh, a

country that has the potential to benefit from social capital due to limited human and high economic vulnerability. Bangladesh also offers a unique context in which to study social capital due to its high density of non-governmental organizations (NGOs) and micro-finance institutions. Furthermore, this study focused on disadvantaged communities within Bangladesh because it has been suggested that social capital is especially beneficial for households that have few assets and little access to services (Carroll, 2001; Wakefield & Poland, 2005).

The primary objective of this study is to examine the measurement of social capital in a new cultural context using qualitative methods, including focus group discussions and cognitive interviewing techniques. Specifically, this study aims to (1) examine the content validity of the measurement of social capital used in the SASCAT in an urban and rural setting in Bangladesh; and (2) propose a newly adapted social capital survey instrument that can be used by future health and development organizations.

Methods

Setting

This study took place in one rural sub-district (Durgapur) and one urban slum (Mirpur) of Bangladesh. Durgapur is a flood-prone area in northern Bangladesh with a population of about 200,000 and Mirpur is a densely populated area in the capital city of Dhaka with a population of about 1 million. Durgapur and Mirpur were selected based on the high rates of poverty, low levels of literacy, and poor infrastructure in the each area.

Survey Instrument and Validation Process

The SASCAT was used as the foundation of the systematic evaluation of social capital survey questions in Bangladesh because it is relatively short in length and it has been cognitively validated in the developing world (De Silva et al., 2006). In order to adapt the SASCAT for use in Bangladesh, three different methods of evaluation were used. Figure 3.1 displays the methods used in the survey question validation process for this study (Groves et al., 2009). First, expert reviews were used to assess whether or not the content of the SASCAT questions were appropriate for measuring social capital. The reviews were based on suggestions by De Silva and colleagues (2006), an independent review by a social capital subject matter expert, and a final review by our research team from the International Center for Diarrheal Disease Research, Bangladesh (ICDDR,B). Following the expert review, the questions were translated into Bangla. Second, two focus group discussions were conducted with members of the target population (one for men and one for women) in the two survey areas (Durgapur and Mirpur). The focus groups provided an opportunity to explore what people know about topics covered in the survey—such as group membership, social support, social trust, and collective action—and better understand the terms they use when they talk about these topics. This is a critical step in the validation process because mislabeled response options, such as types of local organizations, may cause respondents to guess or respond randomly (de Ulzurrun, 2002). Third, cognitive interviews were used to learn how the respondents understood the social capital questions and discover how they formulated their answers. The remainder of this section will provide a detailed account of the methods used to cognitively validate the draft social capital survey instrument. Table 3.1 displays the original social capital survey questions from the SASCAT, the adaptations to the questions based on expert reviews, and the final adaptations used in the cognitive interviews based on focus group discussions.

Sampling and Data Collection

In collaboration with ICDDR,B, four interviewers (three women and one man) who had experience in qualitative interviewing and are familiar with the study areas were recruited. The interview team had a two-day training on social capital and cognitive interviewing. The cognitive interview training was based on a short-course developed by Willis (1999) and included theory on cognitive processing, verbal probing techniques, examples of cognitive interviewing from previous surveys, and mock interviews using the draft survey questions. Following the training, the interview team went door-to-door to recruit eight men and eight women from each study area to participate in the cognitive interviews. The final sample included 32 participants, and they reflected the socioeconomic and demographic characteristics of the population in each area (Table 3.2).

Each respondent was independently and separately asked nine structured survey questions (Table 3.1, Column 3). Following each question, scripted verbal probes were used to better understand the four-stage process of responding to survey questions: comprehension of the question, retrieval of information from memory, decision about what to report, and response strategy (Willis, 2005). Verbal probing was used because it helps focus on potential sources of response error, it avoids discussion that may be irrelevant and non-productive, and it is more natural for respondents (compared to "think-aloud", another popular cognitive interviewing technique). The probing questions were designed following a similar set of probes introduced by Willis (2005), who includes probes about the wording of the question, comprehension of key terms, recall of specific information, sensitivity of content, and appropriateness of response

categories. Table 3.3 provides examples of some of the probing questions used in the cognitive interviews.

All interviews were conducted in Bangla and took place in the respondent's home away from family members and other distractions. Interviews lasted between 30 and 60 minutes (41 minutes on average). The interviewer received written consent to interview and tape record each respondent. The Principal Investigator (PI) was present during half of the interviews and supplemented the interviews with field notes describing methodological, theoretical and personal observations during the data collection period. This project was approved by the University of Michigan Institutional Review Board (ID# HUM00067182) and the ICDDR,B Ethics Review Committee.

Data Analysis

Respondents were de-identified using a numerical code. Interviews were transcribed, translated into English, and analyzed using NVivo 10.0. Formal codes were used to identify problems embedded in the survey questions. The coding scheme was developed following the seven categories described by Presser and Blair (1994). Two separate investigators (WS and FT) independently coded four interviews and tailored the coding scheme for this study. The remaining interviews were coded by WS in order to identify the primary difficulties that respondents had with each survey question.

Results

This section is organized by each phase in the survey question validation process (Figure 3.1). First, I provide a brief overview of the original SASCAT survey instrument that was used

in this study. Second, I present major changes to the survey questions based on expert review. Third, I discuss additional changes to the language used in each question based on focus group discussions. A summary of the first three steps in the validation process is shown in Table 3.1. Fourth, I present major difficulties that respondents had with the social capital survey questions based on the cognitive interviews as well as present recommendations for the modification of the troublesome questions. The recommendations are included in a revised version of the SASCAT for use in Bangladesh, which can be seen in Table 3.4.

Social capital survey instrument

The SASCAT was divided into two sections to measure different aspects of structural and cognitive social capital (Table 3.1, Column 1). The questions about structural social capital were further divided into four categories: group membership, support from groups, support from individuals, and collective action. The question about *group membership* asked, "In the last 12 months have you been an active member of any of the following types of groups in your community?" The intended purpose of this question was to measure social interactions with other group members because individuals who are actively involved in groups are more likely to establish meaningful relationships compared to those who are relatively inactive. The question about *support from groups* asked, "In the last 12 months, did you receive from the group any emotional help, economic help or assistance in helping you know or do things?" This question was designed to measure different types of social support (economic, emotional, and instrumental) received from groups to which the respondent belonged. The question about *support from individuals* was the same as the question about support from groups, but provided a list of types of individuals from whom the respondent received help (e.g., family, friends, and

neighbors). There were two questions about *collective action*: "In the last 12 months, have you joined together with other community members to address a problem or common issue?" and "In the last 12 months, have you talked with a local authority or governmental organization about problems in this community?" These two questions were designed to assess respondents' ability to mobilize and undertake collectively desired actions to address community problems.

The questions about cognitive social capital were divided into two categories: trust and social cohesion. There were two questions about *trust*: "In general, can the majority of people in this community be trusted?" and "Do you think that the majority of people in this community would try to take advantage of you if they got the chance?" The intended purpose of the first question about trust was to assess respondents' general sense of trust of their community, whereas the intended purpose of the second question was to understand respondents' perception of fairness in their community. Finally, there were two questions about *social cohesion*: "Do the majority of people in this community generally get along with each other?" and "Do you feel as though you are really a part of this community?" These questions were designed to assess respondents' sense of social harmony and sense of belonging in their community.

Expert reviews

During the expert reviews, the most significant changes to the survey instrument were related to the questions about structural social capital (Table 3.1, Column 2). In order to help respondents better understand the meaning of the term "active member" in the first question, the original World Bank survey was revisited and the phrase "such as by attending meetings or volunteering your time in other ways" was added. De Silva and colleagues (2006) found that the original wording of the question related to support from groups asked about three types of

support (economic, emotional, and instrumental) in one question. As a result, respondents primarily reported economic support, but rarely reported emotional and instrumental support. Therefore, the question was separated into three questions to ask about each type of support received from groups. The question about support from individuals was also divided into three questions. Further review by a social capital subject matter expert led to the inclusion of three additional questions about *potential* sources of individual support. Each question described a hypothetical scenario that would lead the respondent to seek emotional, economic, or instrumental support. These questions were added to reflect Bourdieu's (1986) theory of social capital, which defines social capital as actual or potential resources embedded in one's social network. By conceptualizing social capital as a potential resource, it is possible to assess different forms of support that exist, but have not been recently accessed. This differs from the previous questions about received support, where the respondents had encountered a reason to access the support available to them.

The only change to the cognitive social capital questions was related to the question about respondents' general sense of trust of their community. De Silva and colleagues (2006) found that respondents were unwilling to report their trust in people in general, so they recommended that three separate questions be asked about trust in neighbors, leaders, and strangers. Therefore, this question was also divided into three separate questions.

Focus group discussions

Following the focus groups discussions, the primary changes were related to simplifying the language and contextualizing the response categories (Table 3.1, Column 3). First, it was important to define the "community" before asking questions about social capital (Earthy et al.,

2000). Therefore, I wanted the respondents to understand that we were studying the community as defined by its geographical boundaries, not a socially constructed concept of community. This is in-line with Putnam's definition of community as a geographically defined space (Putnam, 1995). Therefore, the word "community" was replaced with the word "area" (urban) or "village" (rural) and a sentence was added to the beginning of the survey that stated, "Now I am going to ask you some questions about your area/village. By area/village, I mean Baumiabadh Tin Shed Colony/Durgapur village". The interviewers used the term "area" and "village" throughout the survey when referring to the geographical community. Second, the response options for questions about group membership and group support were changed based on the types of groups most prevalent in Bangladesh. The new groups that were added to the list of response options included: vocational training group, savings groups/community cooperative, microcredit program, and youth/student club. Third, for the questions about support from groups and individuals, the focus group discussions revealed that "sympathy or psychological support" was a better description of "emotional help", and "training" was a more familiar term compared to the phrase "assistance in helping you know or do things". Fourth, for the question about support from individuals, the response option "family" was divided into two categories: "immediate family" and "relatives". Fifth, the first question about collective action was slightly revised to use more familiar language by changing the phrase "address a problem or common issue" to "identify or solve a problem". Sixth, the question about trust in "strangers" (an unfamiliar term to most focus group participants) was further modified to ask about trust in "someone you don't know". Seventh, one phrase in each question about social cohesion was changed. In the first question, the phrase "get along" was replaced with "have good relationships" when respondents were asked how they felt about the majority of the people in

their area. In the second question, respondents were asked if they felt as though they "are really a part of this community", which was replaced with the phrase "this area is yours".

Cognitive Interviews

After the expert reviews and focus groups discussions, the revised survey instrument was used for the cognitive interviews. This section describes the primary difficulties that respondents encountered during each section of the survey instrument and provides recommendations for a newly adapted survey instrument for use in Bangladesh (Table 3.4).

Group membership

The cognitive interviews revealed that the majority of respondents understood the term "member", but they had difficulty understanding the term "active member". In particular, women and rural respondents had more difficulty defining "active member" compared to men and urban respondents, respectively. Some respondents understood "active" to mean "good" and refer to one's ability to pay back a loan to a microcredit organization. Other respondents thought an "active member" was a member with a formal role in the organization.

I: What do you mean by the active member?

R: …Suppose I borrow the money and do not return the money, then those members are not good, sister. The member who receives the money but does not return it, are they good sister? The other members of this cooperative said she is good because she returned the money. Conversely, if I take the money and do not return it, do not give them

the profit, also do not return them the capital, and then I am not a good member, sister. (40-year-old urban female)

I: Which kind of people do you think are active members?

R: We understand this, as a secretary or president in a group or committee. (24-year-old rural male)

During the cognitive interviews, the interviewer read the names of the different types of groups from which the respondent could choose. However, due to the length of the list, the respondents had trouble remembering the response options. Over half of the respondents were illiterate, so it did not help to show them the list. Those who were able to remember some of the response options were more likely to report the types of groups mentioned at the end of the list. This is known as a "recency effect", where placing a response option at the end of a list increases its popularity. In addition, the mere presence of the list of response options may have limited the types of groups the respondents were able to recall.

In the revised version of the SASCAT, the question about group membership was separated into two questions due to the confusion about what it means to be an "active member". The first of the two new questions remained the same, but the word "active" and the modifying phrase "such as by attending meetings or volunteering your time in other ways" were removed. The second question asks, "In the last 12 months, how would you describe your involvement in the groups in which you are a member?" Response options include a list of potential activities based on the cognitive interviews, such as "received a loan or other form of financial support", "attended meetings", "volunteered time my time", and "served as a leader of the group".

Due to respondents' difficulty with remembering the list of response options, instructions were added to the survey instrument for questions with more than three response options. The interviewer is now instructed to allow the respondent to respond before reading the list of response options, and categorize each response. Once the respondent has an opportunity to report his or her response, the interviewer then reads the list of response options to help the respondent recall other groups he or she may have forgotten to mention.

Support from groups

The cognitive interviews showed that over half of the respondents had difficulty distinguishing between sympathy/psychological support and economic help. Most respondents associated sympathy/psychological support with life events that would require financial help. Other respondents perceived economic help as a way of showing sympathy. Those in the urban area had more difficulty than those in the rural area distinguishing between these two forms of support.

R: I understand psychological help or support to mean that, if there is an accident, then if someone comes and gives me sympathy, I can call it psychological support. If I have some other problems, monetary problems, and someone gives me anything, that is also help.

I: That means, if someone gives you money, that is psychological help?

R: No, that's not psychological help. But, it can be, in many cases.

I: How?

R: If there is any kind of accident and if I do not have money…then, if someone gives me money; that is psychological help….In that situation, this kind of help can reduce my load. It reduces psychological pressure. (40-year-old urban female)

I: Do you understand what is meant by psychological consolation or psychological help?

R: Suppose if someone comes forward when I am in trouble, okay. Suppose someone gives me a little loan, I think even that would be good for me. But this never happens, no help at all. (40-year-old urban male)

Some respondents reported that when they received a loan they did not always perceive this as "help" because they had to repay it, whereas other respondents classified loans as economic help.

I: Have you received economic help in the last 12 months?

R: I took loan from my brother.

I: Are you calling this economic help?

R: No. I may get the money on time and work and return the money in a timely manner. This is not economic help. This is…

I: This is help for a while, but you have to give it back.

R: I have to give that back.

I: Economic help should be something that is given for good.

R: For good. (40-year-old urban female)

I: Can you give some examples of economic help?

R: [Economic] help is…say you are a poor person and I give you ten thousand Taka. With this money you will do business. When you save some money with this, then you will return the money to me. The money I gave you to do business, it is [economic help]. (25-year-old urban male)

In addition to monetary help, many other types of economic help were mentioned by the respondents, including food, clothing, and materials to help rebuild a house.

The term "training" was too specific and did not describe the various forms of instrumental support that the question was originally designed to capture. "Training" was often understood as teaching some kind of skill or trade, whereas a program that teaches about hygiene was called a "meeting".

I: What came to your mind when I asked you about training?

R: We call the training as meeting. A discussion is held there. They call all the women of the village.

I: What do they discuss about? Can you tell me one or two topics that are discussed there?

R: Suppose, one should wash their hands before eating anything. One should wash hands after they go to the toilet.

I: What do you call a training?

R: Training refers to the fact that, they teach some works, such as sewing… how to do poultry and gardening… this is what we call as training. (20 year-old rural female)

There is a need to reframe the questions about group support in the revised version of the SASCAT due to respondents' difficulty with distinguishing and defining the three types of support. Since the original SCAT developed by the World Bank combined questions about individual and group support (Krishna & Shrader, 2000), the recommended changes to the questions about group support are addressed at the end of the section on individual support.

Support from individuals

The questions about support from individuals were divided into two groups of three questions: one group of questions asked about support *received* from individuals in the last 12 months and the other group of questions asked about *potential* support from individuals. The respondents had the same problems with the questions about the three types of individual support received as they had with the questions about group support received, namely distinguishing between sympathy/psychological support and economic help. The cognitive interviews also revealed that respondents who received individual support in the last 12 months had also recently experienced an economic loss or some other unforeseen hardship. Therefore, received support appeared to be correlated with negative life events.

> *I: Have you received any economic help from any of these people in the last 12 months?*
>
> *R: Economic help…I got in the last twelve months…that is my elder brother. Suppose if I am in trouble, such as I do not have rice or money, then my elder brother gives that.*
>
> *I: Has your elder brother given you anything in last few days?*
>
> *R: Yes, he always gives.* (33-year-old rural male)

I: Have you received any financial benefit from anyone on the list?

R: No. It wasn't required for me to take money. If it was necessary, then I must have needed help.

I: You didn't need [help], so you didn't get it.

R: I wasn't in need. If I needed [help], I would have got some help….If I need any small amount, then I get it from my father- and mother-in-law. (35-year-old rural female)

Respondents had more difficulty with questions about received emotional, financial, and instrumental support compared to questions about potential support. This may be due, in part, to the hypothetical situations given in each of the questions about potential sources of support. The hypothetical scenario gave the respondent a way to relate to the question and avoided some of the misunderstandings of the terms and phrases used in the questions about received support.

Although the questions about potential support were easier for respondents to understand, they need to be reframed in future versions of the survey instrument. All three questions about potential support ask, "Who do you think people in your area could turn to for help in this situation?" This led to a list of potential sources of social capital in the community, but it was not clear whether the respondent would actually seek this type of support. Some respondents only felt comfortable talking about the support they would provide. They did not feel comfortable talking about the support people in general would seek if they needed help.

I: In your opinion, if someone's father expires in this region to whom might he go for help?

R: I can't say that. If someone dies, I go running to bury him. I take care of the ablution.

I: Right. But suppose someone nearby you…

R: I take care of the ablution. I carry them to the grave. That's all I know. I don't know if they get something from others or not. (60-year-old urban male)

The focus on "people in your area" made it difficult to approximate of potential sources of support that exist in the community.

The most significant changes to the revised version of the SASCAT came from the questions about support from groups and support from individuals. The cognitive interviews revealed that questions about potential support were more successful than questions about received support because (1) they got around the terms used to describe the different types of support by using hypothetical scenarios, and (2) they avoided the potential correlation between high levels of support received in the last 12 months and the frequency of negative life events during the same time frame. In addition, it has been suggested that there is significant overlap between the response categories for individual and group support (De Silva et al., 2006). Therefore, all six questions about group and individual support received in the last 12 months were removed. Social support is now assessed by the three questions about potential sources of support, which includes types of individuals and types of groups in the response options. The new questions about social support are a more accurate representation of the questions in the original SCAT. These questions were reframed to focus on the respondent (e.g., "Who would you turn to for help in this situation?"), instead of the community in general (e.g., "Who do you think they could turn to for help in this situation?"). This is consistent with the other questions in the survey instrument and is a better approximation of actual sources of support that exist in the

community. The response options include all types of individuals as well as two additional response options: “a group in which I am a member” and “a group in which I am not a member”.

Collective action

Most respondents associated community “problems” with infrastructure issues—such as latrines, roads, and utilities (electricity, gas, water)—as well as crop failure, house fires, and quarrels between community members. Respondents typically talked with a local authority or government organization when they faced problems related to infrastructure. More than one-third of the respondents, most of whom were women, had difficulty understanding the term “local authority” when asked about talking with someone about problems in their village or urban slum. When the term “chairman” or “local leader” was used, then most respondents were able to better understand the intended meaning of “local authority”.

As with questions about received support mentioned in the previous section, there appeared to be a correlation between people who report getting together to solve problems and communities that have more social problems.

> *I: In the last twelve months have you joined together with others to solve a problem?*
>
> *R: No, we have not suffered such problems, sister. To my knowledge, sister, whether anyone suffered, I cannot tell. To my knowledge, in the last twelve months, I have not suffered from such problems.* (40-year-old urban female)

> *I: In last twelve months, have you sat with local people to solve a problem together?*
>
> *R: Of course we do.*

I: What was the problem?

R: Different people come here with different problems. There is no limit of problems.

I: Can you tell me one or two problems? I have to know what sort of problems you usually face.

R: There is often quarrel among the people, one slaps another….As you know this is a village, not town, so problems they face include, suppose, someone's goat has eaten the rice paddy of another person. Then they slap the owner of the goat and there is village court to resolve the matter and so on. (40-year-old rural male)

There were very few changes made to this section of the revised version of the SASCAT since most respondents understood the questions about collective action. The only term that caused some confusion was "local authority", which was replaced with the phrase "local leader or chairperson". In addition, the focus on "problems" in each of these questions was removed in order to address the possibility that people who join together to solve problems may live in communities with more problems. Instead, the question was rephrased to ask about joining together to "address important issues" and talking with a local leader, chairperson, or government organization about "the development of your village or area".

Trust

The cognitive interviews revealed that most people understood the term "trustworthy" to mean someone in whom you "believe" or "have faith".

I: What do you [mean by] trustworthy?

R: We mention the word trustworthy for those we believe, and those we do not believe, they are not. Those who we believe, we tell them the words in our heart, and work closely with them, and those we do not believe, we are good with them from the outside, but not good from inside. Do you understand? (49-year-old rural female)

Most respondents understood the terms "neighbor" and "leader"; however, women had more difficulty than men identifying a local "leader" when asked if they trusted their leaders. Although most respondents also understood the phrase "people you don't know", it was difficult to for them to report their ability to trust this category of individuals.

I: The people you don't know in this locality, do you believe them?

R: No, how could I believe them and how could I disbelieve them also. The people I don't know, I don't go to them and I don't mix with them. So how could we believe them? And how could we disbelieve them? We don't have an idea of whether he is good or bad. Then what should I call him. I can neither call him good nor bad. (22-year-old rural male)

Although the question about trust was divided into three separate questions to distinguish between different categories of people, the cognitive interviews revealed that asking whether people are "trustworthy" was not a simple yes-no question. As Cook (2005) argues, a sense of trust often depends on the individual and the situation.

I: Are your neighbors trustworthy to you?

R: Could everyone be trustworthy? Some people are against and some are trustworthy to one, not all are equal. If all are equal then will the world run? Some people are against and some are in my own party, in this way the world run. Are all the people equal? (49-year-old rural female)

I: Is the local leader of this area is trustworthy?

R: Leader is trustworthy, but I don't understand what kind of trustworthy?

I: Trustworthy as [I asked] before, such as whether the leader is trustworthy?

R: For what? Any type of work? Leaders aren't trustworthy for any type of work. In case of some activities they are, but not in all cases. (21-year-old urban male)

For the last question about trust, only one-quarter of the respondents had a difficult time understanding the phrase "take advantage of", most of whom were women. Most respondents understood this phrase to mean "cheating" or "creating trouble". This was usually discussed in reference to money or property and, at times, respondents mentioned that these things were taken by force.

For all questions about trust, approximately one-quarter of the respondents reported discomfort with the questions, most of whom lived in the urban area. In order to reduce the potential for response bias in the future, it is important for interviewers the to make sure that sensitive information cannot be overheard by household members or neighbors when asking about trust.

Based on these findings, two changes were made to the questions about trust in the revised version of the SASCAT. First, the question about "trusting people you don't know" was

removed. This question did not provide an accurate depiction of social trust in the community because it was difficult for respondents to understand. Second, the response option "sometimes" was added to all questions about trust. This gives respondents some additional flexibility when reporting their answers about trust.

Social cohesion

During the cognitive interviews, most people understood the concept of "having good relationships" with one another. They described this concept as working together to overcome problems or disputes. As with the questions about trust, some respondents had difficulty identifying their response to this question because they could not respond "yes" or "no".

> *I: Do the villagers here have good relationships with each other?*
>
> *R: Some of them get along while others do not…Suppose, someone is good today and another person is living badly…that means, people can be of two types…they don't get along.* (21-year-old urban male)

Respondents did not have any problems understanding the question, "Do you feel that this area is yours?" When asked why they felt like this was their own area, they talked about growing up in or being born in the area, going to school or working in the area, and owning a house in the area. In a few cases, female respondents mentioned that they were from a different area, but they moved to their husband's village or neighborhood to live with her in-laws. Most women still reported that their new area belonged to them.

I: Is your parent's home also here?

R: No my parent's home is in the distant place from here.

I: Okay, it is far away. Then do you believe this area is your own?

R: Now I believe it is my own. If I face any problem, then I could go to ten people to seek help and at least half of them will help me. And all of us stay together all the time.

I: Okay, why do you think this area is yours?

R: I believe this area is my own because when I came from that [area] to this [area], then I have to believe it's my own….My husband and family are here; my in-laws are also here. (20-year-old rural female)

Due to respondents' ability to interpret these questions as intended, no changes were made to the actual questions about social cohesion in the revised version of the SASCAT. The only change that was made was the addition of a response option to each question, so respondents can choose from "yes", "sometimes", and "no".

Discussion

This is the first known study to cognitively validate the measurement of social capital in Bangladesh. Expert reviews and focus group discussions were used to assess whether the content of the survey questions were appropriate for measuring social capital and to better understand the terms people used when they talked about topics related to social capital, respectively. Cognitive interviews were then used to examine four cognitive processes used by respondents to answer each survey question: interpretation, retrieval/recall of information, judgment formation, and response mapping (Beatty, 2004; Willis, 2005). The findings from the

expert reviews, focus groups discussions, and cognitive interviews were used to create a newly adapted social capital survey instrument that can be used by health and development organizations in Bangladesh where social capital is just one element of a broader study (Table 3.4).

The expert reviews and focus group discussions contributed to four overall changes to the survey instrument: (1) changing the terminology to contextualize and clarify some of the concepts that were difficult to understand in the original survey instrument, such as the definition of the geographic "community" in which each respondent resided; (2) adding/changing response options to reflect the types of groups present in Bangladesh, such as microcredit organizations; (3) separating questions about social support and trust to be more specific about support received and the people in whom you trust; and (4) adding new questions about potential sources of social support to the survey instrument to assess the different forms of support that exist, but had not been recently accessed.

The cognitive interviews indicated that additional changes needed to be made to the new version of the survey instrument. In addition to further changes to the terminology used in the questions, the other significant changes included: (1) separating the question about group membership into two questions; (2) removing all questions about actual support received from groups and individuals; (3) retaining the questions about potential support, which included types of individuals and types of groups in the response options; (4) reframing the collective action questions to focus on community development, instead of community problems; and (5) adding the response option "sometimes" to questions about trust and social cohesion. Now that a new survey instrument has been developed for use in Bangladesh, the next step is to conduct a field pretest with a small, representative sample of individuals (Figure 3.1). This will allow us to

evaluate the survey instrument as well as the data collection and sampling procedures (Groves et al., 2009).

The revisions made to the new social capital survey instrument did not alter or change the core components of cognitive social capital (i.e., trust and social cohesion) or structural social capital (i.e., group membership, social support, and collective action. As in prior studies that were set in different countries (Blaxter & Poland, 2002; Boreham, 1999; Earthy et al., 2000; De Silva et al., 2006; Tuan et al., 2005), the distinct components of social capital were found to be relevant in the Bangladesh context as well. However, the terminology, response options, and structure of the questions needed to be contextualized in order for respondents to report accurate answers to each question.

In addition to the new survey instrument, this study provided insight into three remaining challenges in social capital survey research: (1) measuring group membership, (2) assessing social trust, and (3) tailoring the survey instrument to fit the social and political context. First, previous efforts to evaluate questions about group membership found these questions to be the most difficult for respondents to answer (De Silva et al., 2006; Earthy et al., 2000). The measures of group membership used in this study were similar to the measures used by the American Citizen Participation Study and World Values Survey, where membership was measured by asking whether the respondent belongs to or is a member of any of the list of group types. However, these questions did not measure whether respondents were members of more than one group in any particular group type. Some argue that this is important because of the notion that multiple memberships are an indication of higher levels of social capital (de Ulzurrun, 2002). However, if the same people belong to the same groups, then belonging to multiple groups would not lead to an increase in the number of unique social ties. Therefore, the

final question on group membership in the revised version of the SASCAT retained the list of group types.

As in the World Values Survey, the new question about group membership was split into two questions asking about group membership and the level of involvement in the groups (Narayan & Cassidy, 2001). Asking about one's level of involvement is important because "participation" questions can confuse the number of groups one belongs to with the level of participation (Blaxter & Poland, 2002). Associational involvement is an important aspect of social capital that should be carefully measured because (1) it has the potential to expand the range of weak ties among individuals who otherwise would not interact and (2) it promotes the creation of social trust and norms of reciprocity at the community level (de Ulzurrun, 2002).

The second major challenge encountered was related to perceptions of trust. The question about generalized trust was reframed into questions about interpersonal trust in neighbors, leaders, and strangers based on the findings from Peru and Vietnam (De Silva et al., 2006). Even after separating the types of individuals, respondents still had a difficult time responding to questions about trust because their sense of trust depended on the individual and the situation. These findings provided two important observations about future social capital surveys that measure trust.

First, perceptions of generalized trust are difficult to measure and are often inaccurate approximations of relational trust. Blaxter and Poland (2002) found that individuals' perceptions of trust were not indicators of generalized trust in communities in the UK. Their respondents reported that there are certain individuals who are trusted, but groups of others who are not. Furthermore, respondents found trust to be a difficult concept to talk about because they trusted people under specific circumstances (Blaxter & Poland, 2002). Earthy and colleagues (2000)

also found that respondents had difficulty conceptualizing trust at the community level and preferred to talk only about people they knew personally. Cook (2005) takes it a step further and suggests that generalized trust is not necessarily a component of social capital, but rather a trait or personality characteristic. If trust cannot be generalized, then how should it be measured in social capital surveys?

This leads to the second observation about the measurement of trust: trust is conceptualized in relational terms and often relates to specific individuals and situations. In fact, there are few individuals who trust everyone or who trust one person completely with respect to all things (Cook, 2005). In a study by Sturgis and Smith (2010), they found that many respondents actually think of people they know when responding to questions about generalized trust. This has implications for what questions about generalized trust are actually measuring. Instead, questions about trust should focus on interpersonal trust, which is a better representation of social capital. The significance of trust related to social exchanges within one's social networks is a critical part of social capital (Cook, 2005). Bangladesh provides an excellent example of a society in which networks involving trust relations are the dominant mode of social exchange due to the density of non-governmental organizations and microfinance institutions.

The third challenge facing future social capital surveys draws upon the unique context of Bangladesh, namely survey questions need to be tailored to fit the social and political environment in which they are administered. The relatively high frequency of respondents mentioning affiliation with a microcredit or microfinance organization when asked about group membership or social support reflects the unique culture created by microfinance institutions in Bangladesh. As of June, 2011 there were 576 licensed microfinance institutions in Bangladesh with over 26 million clients (Microcredit Regulation Authority, 2013). These institutions,

starting with Grameen Bank in the 1980s, were created to provide credit to poor people, specifically poor rural women, so that they can become self-employed (Khandker, 1998).

The impact of the microfinance sector on the measurement of social capital cannot be ignored in Bangladesh. Group-based microfinance is based on self-selected groups of borrowers that are jointly liable for loans. Borrowers decrease lenders' risk of investment by using their knowledge about each other to find the "right" people to join the group and using peer pressure to ensure repayment of the loans (van Bastelaer, 2000). Being excluded from a microfinance group is a good sign that an individual does not have access to social capital through this mechanism. These individuals are also denied other types of resources that accompany membership in a microfinance group, such as educational opportunities for children and health care resources. Microfinance programs are still learning how to ensure that the poorest members of communities are not further marginalized and have equal access to credit (van Bastelaer, 2000). The microfinance culture in Bangladesh is important to understanding the way in which respondents answer questions about group membership, social support, and trust.

Limitations

This study is subject to a number of methodological limitations. First, the sample included only one village and one urban slum, which may not be representative of all rural and urban areas in Bangladesh. Second, it is possible that cognitive interviewing found "problems" that would not exist under normal survey conditions. For example, in some instances the interviewer appeared to guide the respondent to a particular codable answer, which made it hard to discern if the respondent did not understand the question or if the respondent understood the question and changed his or her answer to please the interviewer. The former would point to a

problem with the questionnaire, whereas the latter might simply be a product of interviewer behavior (Beatty, 2004). Third, cognitive methods can discriminate against less articulate respondents, who find it difficult to verbalize their thought processes. This may bias the findings towards more educated respondents.

Conclusion

If the effects of social capital on health in different social and political environments are to be understood, it is essential for quantitative surveys instruments to be validated using qualitative methods. This is the first known study to use a variety of qualitative survey validation methods to create a contextually appropriate social capital survey instrument for use in Bangladesh. This study emphasizes the importance of using cognitive interviews to ensure that respondents are able to comprehend key terms, recall important information, and identify an appropriate response in a survey about social capital. These validation methods are essential to the development social capital survey instruments in each new cultural context in order to ensure that respondents report accurate answers to questions about the core components of social capital. As efforts to accurately and reliably measure social capital continue to improve, evidence for the linkage between social capital and health will be strengthened.

References

Beatty, P., 2004. The dynamics of cognitive interviewing. In: Presser, S., Rothgeb, J.M., Couper, M.P., Lessler, J.T., Martin, E., Martin, J., and Singer, E. (Eds.), *Methods for Testing and Evaluating Survey Questionnaires*. New Jersey: John Wiley & Sons, Inc., pp. 45-66.

Blaxter, M., and Poland, F., 2002. Moving beyond the survey in exploring social capital. In: Swann, C. and Morgan, A. (Eds.), *Social capital for health: Insights from qualitative research.* London: Health Development Agency, pp. 87-107.

Boreham, R., 1999. Social capital and health: Cognitive pilot report. London.

Bourdieu, P., 1986. The forms of capital. In J. G. Richardson (Ed), *Handbook of theory and research for the sociology of education*. New York, Greenwood Press, pp. 241-258.

Bowden, A., Fox-Rushby, J. A., Nyandieka,, L., and Wanjau, J., 2002. Methods for pre-testing and piloting survey questions: Illustrations from the KENQOL survey of health-related quality of life. *Health Policy and Planning*, 17(3), 322–330.

Campbell, C., and Gillies, P., 2001. Conceptualizing 'social capital' for health promotion in small local communities: A micro-qualitative study. *Journal of Community and Applied Social Psychology*, 11(5), 329-346.

Carpiano, R.M., 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62, 165-175.

Carroll, T.F., 2001. Social capital, local capacity building and poverty reduction. Social Development Papers No. 3, Office of Environmental and Social Development, Asian Development Bank.

Coleman, J.S., 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94(Suppl.), S95-S120.

Collins, D., 2003. Pretesting survey instruments: An overview of cognitive methods. *Quality of Life Research*, 12(3), 229-238.

Cook, K.S., 2005. Networks, norms, and trust: The social psychology of social capital. *Social Psychology Quarterly*, 68(1), 4-14.

De Silva, M.J., McKenzie, K., Harpham, T., and Huttly S.R., 2005. Social capital and mental illness: A systematic review. *Journal of Epidemiology and Community Health*, 59, 619-627.

De Silva M.J., Harpham T., Tuan T., Bartolini R., Penny M.E., and Huttly S.R., 2006. Psychometric and cognitive validation of a social capital measurement tool in Peru and Vietnam. *Social Science and Medicine*, 62(4), 941-953.

de Ulzurrun, L.M.D., 2002. Associational membership and social capital in comparative perspective: A note on the problems of measurement. *Politics and Society*, 30(3), 497-523.

Earthy, S., Maltby, S., Arber, A., and Cooper, H. (2000). The use of cognitive interviewing to develop questions on social capital for the 2000/1 General Household Survey. *Survey Methodology Bulletin*, 46(1), 24-31.

Foley, M.W., and Edwards, B., 1999. Is it time to disinvest in social capital? *Journal of Public Policy*, 19(2): 141-73.

Grootaert, C., and van Bastelaer, T., 2002. Understanding and measuring social capital: A multidisciplinary tool for practitioners. Washington, DC: World Bank.

Groves, R.M., Fowler, F.J., Couper, M.P., Lepkowski, J.M., Singer, E., and Tourangeau, R., 2009. Survey Methodology. New Jersey: John Wiley & Sons, Inc.

Harpham, T., Grant, E., and Thomas, E., 2002. Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17, 106–111.

Kawachi, I., Subramanian, S.V., and Kim, D., 2008. Social capital and health: A decade of progress and beyond. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 1-26.

Khandker, S.R., 1998. Fighting poverty with Microcredit: Experience in Bangladesh. New York: Oxford University Press, Inc.

Kim, D., Subramanian, S.V., and Kawachi I., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 139-190.

Krishna, A., and Shrader, E., 2000. Cross-cultural measures of social capital: A tool and results from India and Panama. Washington, DC: World Bank.

Microcredit Regulation Authority, 2013. Microcredit in Bangladesh. (accessed May 20, 2013); Available from: http://www.mra.gov.bd/index.php?option=com_content&view=category& layout= blog&id=29&Itemid=80.

Narayan, D., and Cassidy, M.F., 2001. A dimensional approach to measuring social capital: Development and validation of a social capital inventory. *Current Sociology*, 49(2), 59-102.

Portes, A., 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.

Presser, S., and Blair, J., 1994. Survey pretesting: Do different methods produce different results? In: Marsden, P.V. (ed.), *Sociological methodology*, Washington, DC: American Sociological Association.

Putnam, R.D., 1993. The prosperous community: Social capital and public life. *The American Prospect*, 38.

Putnam, R.D., 1995. Bowling alone: America's declining social capital. *Journal of Democracy*, 6(1), 65-78

Sturgis, P., and Smith, P., 2010. Assessing the validity of generalized trust questions: What kind of trust are we measuring? *International Journal of Public Opinion Research*, 22(1), 74-92.

Szreter, S., and Woolcock, M., 2004. Health by association? Social capital, social theory and the political economy of public health. *International Journal of Epidemiology*, 33, 650-667.

Tuan, T., Harpham, T., Huong, N.T., De Silva, M., Huong, V.T.T., Long, T.T., Ha, N.T.V., Dewitt, D., 2005. Validity of a social capital measurement tool in Vietnam. *Asian Journal of Social Science*, 33(2), 208-222.

van Bastelaer, T., 2000. Does social capital facilitate the poor's access to credit?: A review of the microeconomic literature. Washington, DC: World Bank.

van Deth, J.W., 2003. Measuring social capital: Orthodoxies and continuing controversies. *International Journal of Social Research Methodology*, 6(1), 79-92.

Wakefield, S.E., and Poland, B., 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60, 2819-2832.

Webber, M.P., and Huxley, P.J. 2007. Measuring access to social capital: The validity and reliability of the Resource Generator-UK and its association with common mental disorder. *Social Science and Medicine*, 65(3), 481-492.

Willis, G.B., 1999. Cognitive interviewing: A "how to" guide. Rockville, MD: Research Triangle Institute.

Willis, G.B., 2005. Cognitive interviewing: A tool for improving questionnaire design. Thousand Oaks, CA: Sage Publications, Inc.

Woolcock, M., 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27, 151-208.

Figure 3.1. Survey question validation process (adapted from Groves et al., 2009)

Table 3.1. Adaptations to the shortened and adapted Social Capital Assessment Tool (SASCAT)

Original SASCAT survey instrument (De Silva et al., 2006)	**Expert reviews**	**Focus group discussions[c]**
STRUCTURAL SOCIAL CAPITAL		
Group membership		
1. In the last 12 months have you been an active member of any of the following types of groups in your community? ▪ Work related/trade union ▪ Community association/co-op ▪ Women's group ▪ Political group ▪ Religious group ▪ Credit/funeral group ▪ Sports group ▪ Other: specify	1. In the last 12 months, have you been an active member—such as by attending meetings or volunteering your time in other ways—of the following types of groups in your community? ▪ Work related/trade union ▪ Community association/co-op ▪ Women's group ▪ Political group ▪ Religious group ▪ Credit/funeral group ▪ Sports group ▪ Other: specify	1. In the last 12 months, have you been an active member—such as by attending meetings or volunteering your time in other ways—of the following types of groups in your *area*? ▪ *Vocational training group* ▪ *Savings groups/community cooperative* ▪ Political group ▪ Religious group ▪ *Microcredit program* ▪ Sports club ▪ *Youth/student club* ▪ Other: specify
Support from groups		
2. In the last 12 months, did you receive from the group any emotional help, economic help or assistance in helping you know or do things? ▪ Work related/trade union ▪ Community association/co-op ▪ Women's group ▪ Political group ▪ Religious group ▪ Credit/funeral group ▪ Sports group ▪ Other: specify	2a. In the last 12 months, did you receive any emotional help from the following types of groups in your community[a]? 2b. In the last 12 months, did you receive any economic help from the following types of groups in your community[a]? 2c. In the last 12 months, did you receive any assistance in helping you know or do things from the following types of groups in your community[a]?	2a. In the last 12 months, did you receive any *sympathy or psychological support* from the following types of groups in your *area*[a]? 2b. In the last 12 months, did you receive any economic help from the following types of groups in your *area*[a]? 2c. In the last 12 months, did you receive any *training* from the following types of groups in your *area*[a]?
Support from individuals		
3. In the last 12 months, have you received any help or support from any of the following, this can be emotional help, economic help or assistance in helping you know or do things?	3a. In the last 12 months, have you received any emotional help or support from any of the following types of people?	3a. In the last 12 months, have you received any *sympathy or psychological support* from any of the following types of people?

Support from individuals (cont.)		
▪ Family ▪ Neighbors ▪ Friends who are not neighbors ▪ Community leaders ▪ Religious leaders ▪ Politicians ▪ Government officials/civil service ▪ Charitable organizations/NGO ▪ Other: specify	▪ Family ▪ Neighbors ▪ Friends who are not neighbors ▪ Community leaders ▪ Religious leaders ▪ Politicians ▪ Government officials/civil service ▪ Charitable organizations/NGO ▪ Other: specify	▪ *Immediate family* ▪ *Relatives* ▪ Neighbors ▪ Friends who are not neighbors ▪ Community leaders ▪ Religious leaders ▪ Politicians ▪ Government officials/civil service ▪ *Person from NGO* ▪ Other: specify
	3b. In the last 12 months, have you received any economic help or support from any of the following types of people[b]?	3b. In the last 12 months, have you received any economic help or support from any of the following types of people[b]?
	3c. In the last 12 months, have you received any assistance in helping you know or do things from any of the following types of people[b]?	3c. In the last 12 months, have you received any *training* from any of the following types of people[b]?
	3d. Suppose someone in the community had something unfortunate happen to them, such as a father's sudden death. Who do you think they could turn to for help in this situation[b]?	3d. Suppose someone in *your area* had something unfortunate happen to them, such as a father's sudden death. Who do you think they could turn to for help in this situation[b]?
	3e. Suppose your neighbor suffered an economic loss, such as job loss (URBAN) / crop failure (RURAL). In that situation, who do you think would assist him/her financially[b]?	3e. No change[b]
	3f. Suppose a woman in your community is preparing to give birth to her first child. Who do you think she would turn to for advice or assistance in this situation[b]?	3f. Suppose a woman in your *area* is preparing to give birth to her first child. Who do you think she would turn to for advice or assistance in this situation[b]?

Collective action		
4. In the last 12 months, have you joined together with other community members to address a problem or common issue?	4. No change	4. In the last 12 months, have you joined together with *others in your area* to *identify or solve* a problem?
5. In the last 12 months, have you talked with a local authority or governmental organization about problems in this community?	5. No change	5. In the last 12 months, have you talked with a local authority or governmental organization about problems in this *area*?
COGNITIVE SOCIAL CAPITAL		
Trust		
6. In general, can the majority of people in this community be trusted?	6a. Can your neighbors be trusted?	6a. No change
	6b. Can leaders in this community be trusted?	6b. Can leaders in this *area* be trusted?
	6c. Can strangers in this community be trusted?	6c. *Do you trust someone you don't know in this area*?
7. Do you think that the majority of people in this community would try to take advantage of you if they got the chance?	7. No change	7. Do you think that the majority of people in this *area* would try to take advantage of you if they got the chance?
Social cohesion		
8. Do the majority of people in this community generally get along with each other?	8. No change	8. Do the majority of people in this *area* generally *have good relationships* with each other?
9. Do you feel as though you are really a part of this community?	9. No change	9. Do you feel *that this area is yours*?

[a] Use the same list of response options as in Question #1; [b] Use the same list of response options as in Question #3a; [c] New terms or phrases from the focus group discussions are italicized and underlined.

Table 3.2. Sociodemographic characteristics of respondents by place of residence (n=32)

Characteristic	Urban (n)	Rural (n)
Sex		
Male	8	8
Female	8	8
Age of respondent (years)		
18-29	6	6
30-44	5	6
45-59	2	2
60 +	3	2
Marital Status		
Never married	3	2
Married	13	13
Widow	0	1
Education		
None	4	4
Primary	5	8
Secondary	7	4
Religion		
Muslim	15	15
Hindu	1	1
Christian	0	0

Table 3.3. Example of scripted probing questions used in the cognitive interviews

Collective action
In the last 12 months, have you talked with a local authority or governmental organization about problems in this area?
Probing questions
Can you tell me in your own words what the question is asking?
Who do you include when you think of a "local authority or government organization?"
Trust
Do you think that the majority of people in this area would try to take advantage of you if they got the chance?
Probing questions
Can you tell me in your own words what the question is asking?
What does the phrase "take advantage of" mean to you as it's used in this question?
In general, is it okay to talk about this in a survey, or is it uncomfortable?

Table 3.4. Revised shortened and adapted Social Capital Assessment Tool (SASCAT) for use in Bangladesh

STRUCTURAL SOCIAL CAPITAL

Group membership

1a. In the last 12 months, have you been a member of the following types of groups in your area?

- Vocational training group
- Savings groups/community cooperative
- Political group
- Religious group
- Microcredit program
- Sports club
- Youth/student club
- Other: specify

1b. In the last 12 months, how would you describe your involvement in the groups in which you are a member?

- Received a loan or other form of financial support
- Attended meetings
- Attended trainings
- Participated in decision making
- Served as a leader of the group
- Other: specify

Social support

2a. Suppose someone in your area had something unfortunate happen to them, such as a father's sudden death. Who would you turn to for help in this situation?

- Immediate family
- Relatives
- Neighbors
- Friends who are not neighbors
- Community leaders
- Religious leaders
- Politicians
- Government officials/civil service
- Person from NGO
- A group in which I am a member
- A group in which I am not a member
- Other: specify

2b. Suppose you suffered an economic loss, such as job loss (URBAN) / crop failure (RURAL). In that situation, who do you think would assist you financially[a]?

2c. Suppose you are (FEMALE) / your wife is (MALE) preparing to give birth to your (FEMALE) / her (MALE) first child. Who do you think you (FEMALE) / she (MALE) would turn to for advice or assistance in this situation[a]?

Collective action

3. In the last 12 months, have you joined together with others in your area to address important issues?

- Yes
- No

4. In the last 12 months, have you talked with a local leader, chairperson, or governmental organization about the development of your area?

- Yes
- No

COGNITIVE SOCIAL CAPITAL

Trust

5a. Can your neighbors be trusted?
- Yes
- Sometimes
- No

5b. Can leaders in this area be trusted?
- Yes
- Sometimes
- No

6. Do you think that the majority of people in this area would try to take advantage of you if they got the chance?
- Yes
- Sometimes
- No

Social cohesion

7. Do the majority of people in this area generally have good relationships with each other?
- Yes
- Sometimes
- No

8. Do you feel that this area is yours?
- Yes
- Sometimes
- No

[a] Use the same list of response options as in Question #2a

Chapter 4

Social Capital and the Utilization of Maternal and Child Health Services in India: A Multilevel Analysis

Chapter Abstract

The body of evidence linking social capital to lower levels of mortality and better self-rated health continues to grow; however, little is known about the relationship between social capital and health care utilization, especially in low- and middle-income countries, such as India. This study examines the association between social capital and the utilization of three types of maternal and child health services—antenatal care, professional delivery care, and childhood immunizations—using the 2005 India Human Development Survey. The multilevel analytic sample includes 9,970 women who recently gave birth and 6,858 children between one and five years of age in 1,800 villages or urban neighborhoods and 22 state-groups. Exploratory factor analysis was used to create and validate six social capital measures. These measures were created for the individual and community levels and used in multilevel logistic regression models to examine whether each form of social capital had an independent, contextual effect on health care use, beyond the characteristics of individual women belonging to a community. Results showed that social capital operates at the community level in association with all three care-seeking behaviors, after adjusting for individual characteristics, community characteristics, and state-

level variations in health service utilization. However, the ways in which the different forms of social capital affect health care utilization differ for each type of health service. Specifically, components of social capital that led to heterogeneous bridging ties were positively associated with all three types of health services, whereas components of social capital that led to strong bonding ties were negatively associated with use of preventive care, but positively associated with professional delivery care.

Introduction

Social capital has recently become one of the most popular sociological concepts to be studied in public health. The idea that social relationships, values, and norms can influence health and health behaviors has been studied in the past (House et al., 1988; Mechanic, 1986); however, the social capital framework offers a unique way to examine these characteristics at an individual and collective level. Social capital theory posits that investments in social relationships and shared community values, such as trust and reciprocity, have the potential to lead to improved health outcomes (Grootaert & van Bastelaer, 2001; Kawachi et al., 2008). Although the body of evidence linking social capital to lower levels of mortality, better self-rated health and healthy behaviors continues to grow (Islam et al., 2006; Kim et al., 2008), little is known about the relationship between social capital and health care utilization, especially in low- and middle-income countries. This is an important omission from the extant literature because access to and utilization of health services is a potential mechanism through which social capital can influence health outcomes (Derose & Varda, 2009; Perry et al., 2008).

In order to better understand the relationship between social capital and health care utilization, there has been an effort in the public health literature to dichotomize the various

conceptualizations of social capital into "structural" and "cognitive" forms (Bain & Hicks, 1998). Structural social capital primarily reflects Bourdieu's (1986) conceptualization of social capital as resources available through social networks. This form of social capital tends to be objectively verified by measuring individuals' actions and behaviors. Cognitive social capital aligns more closely with Coleman's (1988) and Putnam's (1993) concepts of social trust, reciprocity, and effective norms. This form of social capital tends be subjectively verified by measuring individuals' attitudes and perceptions. These two forms of social capital should not be seen as mutually exclusive, but as complementary because they assess different aspects of social capital.

While the majority of public health research conceptualizes social capital as structural or cognitive, others make the distinction between "bonding", "bridging", and "linking" social capital (Gittell & Vidal, 1998; Szreter & Woolcock, 2004). Bonding capital refers to strong ties to family and friends resulting in a densely knit social network where individuals are alike in terms of their social identity (e.g., age, caste, religion, place of residence). Bridging capital, by contrast, refers to weak ties to acquaintances where there is little social involvement between people who are typically not alike in terms of their social identity (Granovetter, 1983). Linking capital is a form of bridging capital that refers to social ties among people interacting across hierarchical power gradients in society (Szreter & Woolcock, 2004). Since these three forms of social capital reflect the nature of social ties, they align more closely with the conceptualization of structural social capital. However, few studies have the capacity to empirically distinguish between bonding, bridging, and linking social capital (Harpham, 2002).

Potential mechanisms through which social capital affects health care utilization are related to components of structural social capital—such as civic participation, political

participation, and social networks—and cognitive social capital—such as social cohesion and collective efficacy (Figure 4.1). Civic participation, which is often measured by membership in community groups, can affect health care use through formally organized activities that address community issues (Carpiano, 2006) or through the informal provision of instrumental and psychosocial support to overcome barriers to care (Perry et al., 2008). Certain types of group membership can also lead to negative outcomes by establishing strong intragroup ties, or bonding social capital, which leads to conformity to traditional norms and restricts individual freedom to make appropriate health care decisions (Portes, 1998). Political participation has the potential to lead to linking ties with people of influence (Poortinga, 2012), which can give rise to opportunities to influence local health policies or lead to social pressure to comply with existing policies. Social capital can also influence health service utilization through social networks between communities (or community members) and representatives of formal institutions such as health care providers, teachers and government officers. These networks are a form of linking social capital and are important for leveraging resources, ideas, and information, especially for poor communities (Woolcock, 2001).

Social cohesion, a component of cognitive social capital, evokes a sense of mutual trust and solidarity among neighbors. This can lead to the ability of a group to enforce and maintain social norms (i.e., informal social control), which can have a positive or negative impact on health care utilization. If group norms promote the use of health services, health care utilization will increase; if group norms discourage the use of health services, health care utilization will decrease. Collective efficacy can also have positive and negative effects on health care use by encouraging individuals to forgo their own self-interest and act in the interests of the group (Coleman, 1988).

To date, there are very few studies on the link between social capital and health care utilization in low- and middle-income countries. Since the relationship between social capital and health can vary across countries, it is important to build an evidence base using measures that can reliably compare the core components of social capital in each new setting (Szreter & Woolcock, 2004). This is especially true in India, a country where maternal and child health service utilization rates differ across states due to a variety of socioeconomic, cultural, and geographic factors (Balarajan et al., 2011; Hazarika, 2012; Navaneetham & Dharmalingam, 2002). In order to elucidate the mechanisms through which social capital affects health care utilization in India, we must first address three important gaps in the existing social capital and health literature: (1) it is unclear whether social capital operates as an individual or collective attribute in relation to health care utilization; (2) few studies empirically differentiate between various components of structural and cognitive social capital; and (3) the majority of studies focus on the positive effects of social capital, ignoring the equally important potential negative aspects of social capital.

First, there is disagreement about whether social capital is an individual or collective attribute. There are many researchers who state that social capital is an ecologic characteristic that should be measured at the group level (Harpham, 2002; Lochner et al., 1999). While other studies report that social capital operates at the individual level through interpersonal trust and civic participation, they acknowledge complex interactions between group-level social capital and individual-level social capital (Poortinga, 2006a; Subramanian et al., 2002). In order to understand how social capital operates as a collective attribute, it is important to consider the size of the geographic area. Studies show that social capital can be better understood at the level of the local community, where it depends on day-to-day interactions between neighbors, compared

to the state or country level, where social capital reflects more distal social policies (De Clercq et al., 2012; Eriksson et al., 2011; Hamano et al., 2010; Mohnen et al., 2011).

The most appropriate analytical approach for studying the effects of social capital is with a multilevel framework (Kawachi et al., 2008; Subramanian, 2004). The hierarchical structure of the data within a multilevel framework allows lower level units (e.g., individuals) to be nested within higher level units (e.g., communities or states). Multilevel analysis provides an opportunity to simultaneously examine the effects of individual characteristics and community characteristics on individual-level outcomes. Furthermore, this type of analysis permits the examination of cross-level interactions, where the effects of higher level variables are modified by characteristics of the lower level units (Diez-Roux, 2000).

Second, there is a need to differentiate between various components of cognitive and structural social capital. If different components of social capital are used in a single measure, then it is difficult to assess what specific factors are influencing health outcomes (Carpiano, 2006; Murayama et al., 2012). In a review of the association between social capital and access to health care, Derose and Varda (2009) found that studies reported a differential effect of various forms of social capital on health service use, which calls into question the practice of combining these different types of variables (cognitive and structural or bonding and bridging) into summary social capital scales. Moreover, studies that distinguish between various components of social capital rarely validate the measures used, making it difficult to determine which components of social capital are actually being measured. Only one study on social capital and health care utilization reported any psychometric properties for the scales used to measure social capital (Derose & Varda, 2009).

Third, more attention needs to be placed on the importance of negative aspects of social capital in relation to health outcomes. Portes (1998) describes four negative consequences of social capital that are often overlooked in the current literature on social capital and health: (1) strong intragroup bonding ties can lead to the exclusion of outsiders, (2) familiar relationships among group members can lead to the problem of "free-riding" and place excess demands on active group members, (3) tight-knit communities can demand conformity and restrict individual freedom and initiative, and (4) social cohesion can create downward leveling pressures to oppose contemporary ideas and innovative thinking for the sake of solidarity.

This study will address all three gaps in the existing literature on social capital and health by examining the relationship between different components of social capital and the utilization of maternal and child health services in India using multilevel framework. Specifically, this study examines: (1) whether social capital has an independent, contextual effect on maternal and child health care utilization, beyond the characteristics of individuals belonging to a community; (2) the differential association between various forms of social capital and three different types of health service utilization; and (3) the potential negative effects of social capital on health care utilization. Before describing the specific hypotheses about social capital in this context, it is important to understand why social capital is relevant to maternal and child health care use in India.

Maternal and child health care use in India

India has seen significant progress towards reducing maternal and child mortality in the past half century, but this progress has slowed in recent years despite the availability of cost-effective health service interventions (Hazarika, 2012). This study focuses on three types of

health services have been shown to reduce morbidity and mortality among women and children. The use of antenatal care has been shown to be an effective way to detect complications before delivery as well as ensure the health of the newborn in terms of growth, risk of infection, and survival (Campbell & Graham, 2006). In addition, every woman should have access to skilled health professionals—such as a doctor, a nurse or a midwife—and adequate health facilities in order to prevent death due to hemorrhage, sepsis, or prolonged labor (Campbell & Graham, 2006). Regarding child survival, vaccination is a proven, cost-effective strategy for reducing mortality among children (Jones et al., 2003).

Studies on the use of maternal and child health services in India have primarily focused on the influence of individual and household characteristics, while largely ignoring the influence of the social environment (Stepheson & Tsui, 2002). This is an important limitation because the sociocultural context is of particular importance to health service utilization in India due to the substantial differences in health policy and expenditures at the state level as well as the salience of village and neighborhood characteristics at the community level. For example, Sunil and colleagues (2006) reported that the percentage of rural women in India who had "excellent" utilization of maternal health services, including antenatal care and delivery care, varied from 6% in the state of Uttar Pradesh to 92% in the state of Kerala. The percentage of children reported to have received all recommended immunizations varied from 27% in Uttar Pradesh to 91% in Kerala (Ministry of Health and Family Welfare, 2005). Variations across states in utilization rates are attributable to a combination of factors such as distance, availability and quality of skilled providers, and adequacy of infrastructure (Desai & Wu, 2010; Navaneetham & Dharmalingam, 2002; Ministry of Health and Family Welfare, 2005).

Community characteristics have also been shown to have an influence on maternal health care use and immunization coverage in India. Stephenson and Tsui (2002) used a multilevel model to examine the association between the use of maternal and reproductive health services and community factors, such as economic development, the strength of the health infrastructure, the presence of health services, and population size. Although population size was the only community-level predictor variable shown to be associated with antenatal care or professional delivery care, there was still unexplained variation at the community level for both service types. These results suggest that influential unobserved community-level factors were omitted from their models. Similarly, Sunil and colleagues (2006) also used a multilevel model to show that the use of maternal health services in India was associated with various programmatic variables measured at the community level, including the presence of women's groups (*mahila mandal*), visits by health workers during pregnancy, and access to public and private health facilities. Vikram and colleagues (2012) showed that the relationship between maternal education and childhood immunization was weakened when community-level predictor variables were added to the model, suggesting that there were unobserved community factors mediating the relationship between maternal education and childhood immunization.

The current study posits that social capital is one of the important unobserved community-level factors omitted from previous studies on the utilization of maternal and child health care in India. While a few studies have examined the link between social capital and health in India (De Silva et al., 2007a; De Silva & Harpham, 2007b; Sivaram et al., 2009; Vikram et al., 2012), no study to date has examined the association between social capital and health care utilization in India.

Study hypotheses

The study hypotheses are based on the conceptual framework presented in Figure 4.1, which depicts the potential mechanisms through which social capital affects health care utilization. After adjusting for characteristics of individuals within each community (compositional characteristics), characteristics of communities (contextual characteristics), and state-level variations in health service utilization using a multilevel approach, I propose the following four hypotheses:

1) Intergroup bridging ties at the contextual level are positively associated with all three types of health care utilization, due to the enhanced availability of new knowledge and financial resources within the community which enable health service use.

2) Intragroup bonding ties at the contextual level are negatively associated with all three types of health care utilization, due to the community's demand for conformity to normative behaviors and restrictions on individual freedom and initiative, which may limit the use of health services.

3) Social networks at the contextual level are positively associated with all three types of health care utilization, due to the availability of linking ties with people of influence in the community, which enable health service use.

4) Social cohesion and collective efficacy at the contextual level are positively associated with all three types of health care utilization, due to individuals forgoing their own self-interest and acting in the interests of the community to help those in need of health care.

In addition to the four hypotheses mentioned above, this study also explores the complex interaction between individual- and community-level components of social capital. Among others, Subramanian (2002) suggested that the association between community-level social capital and health outcomes is moderated by individuals' own personal levels of social capital. Therefore, I will examine this interaction for each component of social capital included in this study.

Methods

Study Population

This study used the 2005 India Human Development Survey (IHDS), a nationally representative, multi-topic survey of 41,554 households in 2,474 villages or urban blocks across 33 states in India (Desai et al., 2005). Household interviews were conducted with 33,510 ever-married women aged 15-49 and included information about all births between the year 2000 and the interview date. The survey covered topics concerning health, education, employment, economic status, marriage, fertility, gender relations, and social capital. The sample for maternal health service utilization included all women who had given birth in the last five years, which yielded an analytical sample of approximately 11,955 women. Villages or neighborhoods with fewer than three households were removed from the sample in order to avoid skewing the results towards the characteristics of women living in these small-sample communities, which reduced the sample size to 11,105. Further omitting those women with item missing data yielded a final

analytic sample of 9,970 women in 1,800 villages or urban blocks. An analysis of the item missing data can be found in Appendix 1. The sample for child health service utilization included the youngest child of the women in the maternal health service utilization sample between the age of one and five. Complete immunization information without item missing data was available for 6,858 children between one and five years in 1,766 villages or urban blocks.

Response Variables

The response variables for this study are (1) whether the mother attended four or more antenatal care check-ups during her last pregnancy, (2) whether the mother's last birth was assisted by a skilled health professional (i.e., a doctor, nurse, or auxiliary nurse midwife), and (3) whether the mother's child had received all recommended immunizations by twelve months of age: three doses of DPT (diphtheria–pertussis–tetanus) vaccine, three doses of polio vaccine, one dose of BCG (Bacillus Calmette-Guerin) against tuberculosis, and one dose of measles vaccine. All three response variables were measured as binary outcomes.

The use of four or more antenatal care check-ups is in accordance with the World Health Organization's recommendation that a minimum of four antenatal visits is needed to accomplish the essential level of antenatal care (Navaneetham & Dharmalingam, 2002). Additionally, this measure has been used by other studies of health service utilization in India (Navaneetham & Dharmalingam, 2002). The measure of skilled delivery care is based on the World Health Organization recommendation that deliveries be assisted by someone with midwifery skills, including doctors, nurses and midwives (World Health Organization, 2005). The measure of complete immunization was based on India's initiative to expand complete primary immunization through the Universal Immunization Program (Sokhey et al., 1989). These three

indicators were selected because of their positive association with improved maternal, neonatal, and child health outcomes (Campbell & Graham, 2006; Jones et al., 2003). Although the three outcomes were slightly correlated (range: 0.21 to 0.45), each type of health service is important to assess because social capital may be related to the use of different health services in different ways. For example, antenatal care and childhood immunizations are preventive behaviors that are planned, whereas delivery by a skilled health professional is often an unplanned decision made at a crisis point, such as during a difficult labor, and requires additional resources.

Explanatory Variables

Social Capital

The primary explanatory variable of interest is social capital. One household respondent was asked 18 questions about the family's social network, participation in social organizations, political activity, conflict in their community, and their community's willingness to work together to solve problems. Exploratory factor analysis was used to create composite indicators of theoretically distinct components of social capital (Chuang & Chuang, 2008; Hurtado et al., 2011; Eriksson et al., 2011; Perry et al., 2008). Appendix 2 provides a detailed description of the exploratory factor analysis methods and results.

The six components of social capital identified from factor analysis were separated into structural and cognitive forms. Structural social capital indicators include civic participation, political participation, and social networks. *Civic participation* was measured by household membership in nine social organizations and divided into two distinct categories: (1) membership in development groups that represent *bridging ties* (women's groups; youth clubs, sports groups, reading rooms; trade unions, business or professional groups; self help groups;

and credit or savings groups) and (2) membership in any religious, caste, or festival organization that represent *bonding ties*. This categorization of civic participation was the same used by Vikram and colleagues (2011), who made this distinction based on the potential differential impact on health care use. *Political participation* was measured by two survey items: (1) "Have you or anyone in the household attended a public meeting called by the village *panchayat*/ *nagarpalika*/ward committee in the last year?" and (2) "Is anyone in the household an official of the village *panchayat*/*nagarpalika*/ward committee?" The first item was measured using a yes-no response and the second item was measured using a 3-point scale: nobody close to household is a member; somebody close to household is a member; or someone in household is a member. *Social networks* were by three survey items: (1) "Among your acquaintances and relatives, are there any who are doctors?" (2) "Among your acquaintances and relatives, are there any who are teachers?" and (3) "Among your acquaintances and relatives, are there any who are government officials?" Each item was measured on a 3-point scale: no; yes, live in a different village or neighborhood; or yes, live in the same village or neighborhood.

Cognitive social capital indicators include social cohesion and collective efficacy. *Social cohesion* was measured by two survey items: (1) "In this village/neighborhood, do people generally get along with each other or is there some conflict or a lot of conflict?" and (2) "In this village/neighborhood, how much conflict would you say there is among the communities/*jatis* that live here?" Each item was measured on a 3-point scale: a lot of conflict, some conflict, and not much conflict. These two questions were used to distinguish between the geographical sense of community and the ethnic sense of community. *Collective efficacy* was measured by one survey item: "In some communities, when there is a water supply problem, people bond together to solve the problem. In other communities, people take care of their own families individually.

What is your community like?" Respondents had two response options: bond together to solve problem or each family solves individually, where bonding together was coded to represent a greater level of social capital.

A factor score for each component of social capital was calculated for each individual. A community-level factor score was created using the entire sample of 41,554 households, not just the 11,955 women who had given birth in the last five years. The community-level score was calculated by taking the average of the individual social capital scores among all respondents in each respective village or urban neighborhood. The individual- and community-level social capital scores were then standardized to have a mean of zero and a standard deviation of one. The scores were standardized to make it easier to interpret results of the regression analyses. Each reported estimate of social capital in the multilevel logistic regression analyses is interpreted as the adjusted odds of health care utilization for each standard deviation unit increase in that social capital variable relative to the variable's average score (Carpiano, 2007). The correlation coefficients among six components of social capital ranged from -0.004 to 0.245, suggesting that they were weakly correlated.

Level 1 Covariates: Individual and Household Characteristics

Other individual and household variables related to maternal and child health care were also included in the regression models. These variables were divided into two categories: (1) covariates related to maternal health care utilization, and (2) covariates related to child health care utilization. Demographic and socioeconomic factors that have been shown to be related to maternal health care use in India were divided into individual and household characteristics (Stephenson & Tsui, 2002; Desai & Wu, 2010). Individual characteristics included the mother's

age, education level, caste, number of children, prior complications during childbirth, and access to antenatal care. Age was self-reported and used as a continuous variable. A quadratic term for age was also included after conducting a Wald test with and without the quadratic term, which showed that age had a non-linear relationship with both maternal health outcomes. Education level was divided into three distinct categories: no education (reference category), standards 1-9, and standard 10-college graduate. Caste was divided into four commonly used categories: Brahmin (reference category), Other Backward Classes, Scheduled Castes (*dalits)*, and Scheduled Tribes (*adivasis*), plus a residual "Other" category. The number of children a woman had was used as a continuous variable. Previous complications during pregnancy were assessed by asking the woman whether or not she had any miscarriages, abortions, or stillbirths. The variable for previous complications was binary and was coded as 1 if the woman responded in the affirmative. Antenatal care was self-reported and was a binary variable coded as 1 if the woman reported attending at least one antenatal care check-up and 0 otherwise. Use of antenatal care was used as an outcome variable as well; therefore, it was used as a predictor variable only in models of delivery by a skilled health professional. Household characteristics included the husband's education level and a household asset index. Husband's education level was divided into the same three categories as his wife's education level: no education (reference category), standards 1-9, and standard 10-college graduate. A household asset index scale, which includes 30 dichotomous housing and consumer goods items, was constructed by IHDS to reflect asset ownership and housing quality. For example, the IHDS asked questions about ownership of a motor vehicle, a cell phone, and a television as well as availability of piped indoor water and electricity. Similar housing and consumer goods questions are used in developing country

surveys to assess household economic level. The household asset index was used as a continuous variable ranging from 0 to 30.

Characteristics that have been shown to be related to childhood immunization use in India were divided into child characteristics, mother characteristics, and household characteristics (Vikram et al., 2012). Child characteristics included the child's age and sex. The child's age was reported by the mother and used as a continuous variable. The child's sex was coded as 1 for female and 0 for male. Mother characteristics include her age, education level, and caste, and household characteristics include husband's education level and a household asset index. Each variable for mother and household is measured the same as described above.

Level 2 Covariates: Community Characteristics

In addition to individual-level compositional covariates, community-level contextual covariates were included to ensure that any effects observed at the community level were due to social capital and not other measured factors. Average household asset scores were included for each community in addition to place of residence. The average household asset index is the mean score for each rural village or urban neighborhood from the entire sample of 41,554 households. This score was used as a continuous variable in the regression models. Place of residence was measured by the cluster from which the respondent was selected and was divided into three distinct categories: urban; rural areas with good infrastructure (where more than 50% of households in the village have access to roads and more than 75% of households have electricity), and rural areas with poor infrastructure (where less than 50% of households in the village have access to roads or less than 75% of households have access to electricity).

Analytic strategy

Multilevel analysis was used to estimate (1) the overall association between community-level social capital and health care utilization with adjustment for contextual and individual compositional characteristics (‘‘fixed effects’’) and (2) the variation in health care utilization outcomes between communities and states (‘‘random effects’’). Three-level random intercept logistic regression models were fitted using maximum likelihood estimation by using the *xtmelogit* command in Stata version 11.1. The three-stage formulation of the random intercept models can be found in Appendix 3.

Six models were used to specify the best fit for the data. **Model 1** is an unconditional means model with only the constant term in the fixed and random parts. This model is useful as a null model that serves as a benchmark with which other models are compared. The intra-class correlation (ICC) is used to examine the proportion of the variance in the outcome that is accounted for by variation between communities (level 2) and states (level 3) (Diez-Roux, 2002). In a three-level model, there are two kinds of intra-class correlations (Rabe-Hesketh & Skrondal, 2012). The first is ICC for individuals within the same state, but different villages/neighborhoods:

$$\frac{(\text{Variance}_{\text{state}})}{(\text{Variance}_{\text{state}}) + (\text{Variance}_{\text{village/neighborhood}}) + (\pi^2/3)}$$

The second ICC is for individuals within the same village/neighborhood:

$$\frac{(\text{Variance}_{\text{state}}) + (\text{Variance}_{\text{village/neighborhood}})}{(\text{Variance}_{\text{state}}) + (\text{Variance}_{\text{village/neighborhood}}) + (\pi^2/3)}$$

The ICC on the null model can be used to justify the use of a multilevel model if there is substantial variation between villages/neighborhoods. **Model 2** is the same as Model 1 with the

addition of individual-level covariates to account for compositional differences between communities. **Model 3** is the same as Model 2 with the addition of community covariates to account for contextual differences between communities. **Model 4** is the same as Model 3 with the addition of community-level social capital variables to assess the contextual effect of social capital on maternal and child health service use after adjusting for compositional factors and contextual factors. **Model 5** is the same as Model 4 with the addition of individual-level measures of social capital in order to assess whether community-level social capital is associated with maternal and child health service use, above and beyond individual-level social capital. **Model 6** is the same as Model 5 with the addition of cross-level interactions between each community-level social capital variable and its individual-level counterpart for a total of six additional interaction terms. This model assesses whether the effect of community-level social capital on health service utilization differs among individuals with varying levels of social capital (Subramanian, 2002).

Results

Descriptive Statistics

Descriptive statistics for all variables included in this analysis are shown in Table 4.1. Forty percent of the women in the sample received four or more antenatal care visits and 50% utilized a doctor, nurse, or midwife during their most recent delivery. Slightly more than half (56%) of the children in the sample received all recommended immunizations by 12 months of age. The average number of births for each woman was 1.41. The number of births per woman in this sample was lower than the total fertility rate in India because women were only asked to report births in the last five years. On average, more women reported having no education (43%)

than men (23%). The largest caste group was Other Backward Classes (40%), which are socially and educationally less-advantaged classes not included among the Scheduled Castes (22%) or Scheduled Tribes (9%). One-third of the sample population lived in urban neighborhoods, while the remainder was categorized as living in rural villages with good infrastructure (27%) or rural villages with poor infrastructure (40%).

Four or more antenatal care visits

Table 4.2 displays the three-level logistic regression model comparisons for the use of antenatal care. Model 4 shows that three components of community-level social capital were significantly associated with antenatal care use after controlling for potential confounding factors at the individual and community level. Net of the other forms of social capital at the community level, women who live in communities with higher membership in groups that help form intergroup bridging ties had higher odds of antenatal care use (OR=1.23), whereas women who live in communities with higher membership in groups that help form intragroup bonding ties (OR=0.79) and women who live in communities with more collective efficacy (OR=0.87) had lower odds of antenatal care use. The final two models show that the association between community-level social capital and antenatal care use remained significant after controlling for individual-level social capital (Model 5) and cross-level interactions between individual and community social capital (Model 6). The estimated odds ratios for the cross-level interactions are not shown in order to conserve space.

In terms of individual-level covariates, having more children was associated with lower odds of antenatal care use. Although the education of both the mother and her husband were significantly associated with the use of antenatal care, the magnitude of the association was

stronger for the mother's education compared to her husband's education. Each caste category was associated with lower odds of antenatal care use compared to the Brahmin caste. A higher household asset score was associated with higher odds of antenatal care use. At the community level, higher average household asset scores were also associated with higher odds of antenatal care use; however, area of residence was not significantly associated with antenatal care use.

The multilevel model was appropriate for this analysis since 63% of the variation in antenatal care was accounted for by the state and community levels. After running the final model for antenatal care, the community-level ICC decreased to 0.51 (19% decline). Although the final model accounted for some of the individual variation in antenatal care use, a substantial amount of community-level and state-level variation remains unexplained.

Skilled delivery care

Table 4.3 displays the three-level logistic regression model comparisons for the use of skilled delivery care. Model 4 shows that three components of community-level social capital were significantly associated with skilled delivery care use after controlling for potential confounding factors at the individual and community level. Women who live in communities with higher membership in groups that help form intergroup bridging ties (OR=1.15) and women who live in communities with more social networks (OR=1.16) had higher odds of skilled delivery care use, whereas women who live in communities with more social cohesion had lower odds of skilled delivery care use (OR=0.91). After controlling for individual-level social capital and cross-level interactions between individual and community social capital, the final model shows that women who live in communities with higher membership in groups that help form intragroup bonding ties (OR=1.18) and women who live in communities with more social

networks (OR=1.14) had higher odds of skilled delivery care use, whereas the social capital variables related to intergroup bridging ties and social cohesion were no longer statistically significant.

In terms of individual-level covariates, use of antenatal care was associated with higher odds of skilled delivery care use, whereas having more children was associated with lower odds of skilled delivery care use. Mother's education was positively associated with the use of skilled delivery care; however, her husband's education was not. Each caste category was associated with lower odds of skilled delivery care use compared to the Brahmin caste. A higher household asset score was associated with higher odds of skilled delivery care use. At the community level, a higher average household asset score was also associated with higher odds of skilled delivery care use and rural areas with poor infrastructure were significantly associated with lower odds of skilled delivery care compared to urban areas.

The multilevel model was also appropriate for this analysis since 56% of the variation in skilled delivery care was accounted for by the state and community levels. The community-level ICC decreased to 0.35 (38% decline) after running the final model for skilled delivery care. Again, a substantial amount of community-level and state-level variation remains unexplained.

Complete childhood immunization

Table 4.4 displays the three-level logistic regression model comparisons for complete childhood immunization. Model 4 shows that three components of community-level social capital were significantly associated with complete childhood immunization after controlling for potential confounding factors at the individual and community level. Children who live in communities with higher membership in groups that help form intergroup bridging ties

(OR=1.37) and children who live in communities with more social networks (OR=1.23) had higher odds of complete immunization, whereas children who live in communities with higher membership in groups that help form intragroup bonding ties had lower odds of complete immunization (OR=0.78). The final two models show that the association between community-level social capital and complete childhood immunization remained significant after controlling for individual-level social capital (Model 5) and cross-level interactions between individual and community social capital (Model 6). In addition, Model 6 shows that children whose families have more social networks at the individual level had higher odds of complete immunization (OR=1.12).

In terms of individual-level covariates, older child and male children had higher odds of receiving all recommended immunizations. Although the education of both the mother and her husband were significantly associated with complete childhood immunization, the magnitude of the association was stronger for the mother's education compared to her husband's education. None of the caste categories were significantly associated with complete childhood immunization compared to the Brahmin caste. A higher household asset score was associated with higher odds of complete childhood immunization. At the community level, average household asset scores were not associated with complete childhood immunization; however, rural areas with good infrastructure were associated with higher odds of complete childhood immunization compared to urban areas.

The multilevel model was also appropriate for this final analysis since 55% of the variation in complete childhood immunization was accounted for by the state and community levels. The community-level ICC decreased to 0.48 (13% decline) after running the final model

for complete childhood immunization. Again, a substantial amount of community-level and state-level variation remains unexplained.

Interaction effects

The most significant interaction effect was between individual bonding ties and community bonding ties for all three outcomes. Figure 4.2 plots the predicted relationship between community bonding ties (*x* axis) and the predicted probability of health care utilization (*y* axis), for individuals with low and high levels of household bonding ties based on results from Model 6. Figure 4.2 shows that individuals with low levels of intragroup bonding ties benefit from communities with higher levels of intragroup bonding ties. However, for individuals with high levels of bonding ties, the effect is reversed, suggesting that communities with higher levels of bonding ties are not particularly helpful to individuals who are already strongly connected to these types of groups.

Sensitivity analyses

Wald tests were used after estimating each of the final three models to show that all individual- and community-level social capital parameters were significantly different from zero ($p<0.001$). In addition, likelihood ratio tests were used to compare the fit of each model to the fit of the previous model. According to the likelihood ratio tests, Models 5 and 6 were often over-parameterized; however, they were included in the final analysis due to their theoretical importance to the aims of this study. In addition to the aforementioned specification tests, several variations of the regression models were analyzed to validate the results. First, regression models that included all women who had given birth in the last five years were tested,

regardless of the number of households in each village or neighborhood. The original models did not include women who lived in village or neighborhoods with fewer than three households in order to avoid skewing the results towards the characteristics of women living in these small-sample communities. There were no substantive differences in the regression results with and without women from the small-sample communities. Second, models where each social capital variable was added separately were tested and there were no substantive differences in the results. This is what was expected because the social capital variables were only weakly correlated. Third, a two-level random intercept model was tested with individuals nested within communities. This model included state-level dummy variables as community-level fixed effects. This model also showed no significant differences from the three-level random intercept model. Finally, a weighted, single-level logistic regression was conducted using sample weights to approximate standard errors instead of partitioning the individual and community sources of variation using a multilevel model. There were no substantive differences in the results; however, the larger standard errors in the weighted logistic regression models led to fewer statistically significant results.

Discussion

The results from this study showed that social capital operated at the community level in association with all three care-seeking behaviors, after adjusting for characteristics of individuals within each community (compositional characteristics), characteristics of communities (contextual characteristics), and state-level variations in health service utilization. These findings are in line with other studies that have found a contextual effect of social capital on other health outcomes, including self-rated health (De Clercq et al., 2012; Eriksson et al., 2011;

Mohnen et al., 2011; Poortinga, 2006b), mental health (De Silva et al., 2007; Hamano et al., 2010), and health behaviors (Chuang & Chuang, 2008). Furthermore, this study showed that individual compositional characteristics of communities were important in explaining health care utilization (i.e., parity, education, caste, household assets); however, there was an effect of "place" or "community" that could not be attributed to compositional differences, namely social capital.

These results countered some prior studies that did not find a contextual effect of social capital on health (Han, 2012; Poortinga, 2006a; Subramanian et al., 2002). This may be due to a number of factors, including differences across studies in the geographic size of the higher level unit of analysis or the outcome of interest. First, unlike studies that focused on the national (Poortinga, 2006a) or administrative-area level (Han et al., 2012), the current study focused on the community level, which was a smaller geographical and social unit. It is has been suggested that social capital operates differently at different geographical levels (Poortinga, 2006a). At the level of the state or country, social capital may represent macro-social forces, such as culture or social and economic policies, whereas, at the community level, social capital may reflect more proximate social relationships, networks, norms and values (Lochner et al., 1999). Second, the prior studies examined self-rated health as the outcome of interest (Han, 2012; Poortinga, 2006a; Subramanian et al., 2002), whereas this study focused on care-seeking behaviors. The lack of an association between self-rated health and social capital in the prior studies may be due to the confounding effect of personality factors, where people who have a favorable view of their community in general, may be more likely to view themselves in a positive way, for example, as being more healthy (Hurtado et al., 2011). In addition, the mechanisms through which social

capital affects self-rated health are likely very different from the mechanisms related to health care utilization (Derose & Varda, 2009).

Across all three health seeking behaviors, the most important components of community-level social capital included three components of structural social capital—intergroup bridging ties, intragroup bonding ties, and social networks—and one component of cognitive social capital—collective efficacy. However, the ways in which the different forms of social capital affected health care utilization differed for each type of health service. This evidence supports the notion that social capital is composed of heterogeneous parts and contributes to the call to measure different components of social capital separately because of their differential effects on health and health care use (Derose & Varda, 2009).

This study supported the first hypothesis by showing that women who lived in communities with more intergroup bridging ties—as measured by membership in local organizations, such as women's groups or credit/saving groups—had higher odds of antenatal care use, higher odds of skilled delivery care use (though this association was not statistically significant), and were more likely to have their children completely immunized. Bridging social capital has been described as an opportunity for individuals within a community to interact with diverse, heterogeneous groups of people (Islam et al., 2006). This form of social capital may positively influence health care utilization by facilitating access to services and resources (Kawachi & Berkman, 2000), providing a voice to communities that are marginalized from sources of power (Cornish, 2010), or encouraging more contemporary modes of thought and increasing information about modern preventive health services (Vikram et al., 2012).

This study also found evidence to partially support the second hypothesis by showing that women who lived in communities with more intragroup bonding ties—as measured by

membership in religious or caste group—had lower odds of antenatal care use and were less likely to have their children completely immunized. In contrast to bridging social capital, it has been suggested that bonding social capital can have a negative effect on health, particularly for poor communities (Islam et al., 2006; Kawachi et al., 2008). In a study by Paek and colleagues (2008), they found that community-level social capital had a negative effect on family planning behaviors in Uganda due to the existing norms and values that discourage the use of family planning methods. Bonding social capital has been described as "the primary means for the transmission of behavioral norms to family members and friends (Islam et al., 206, p. 6)." Therefore, if behavioral norms discourage the use of health services, then communities with high levels of bonding social capital will have lower levels of health service utilization. This is particularly relevant in the South Asian context, where the use of preventive maternal health services, such as regular antenatal check-ups, is rarely encouraged because these health services are perceived as existing for only curative purposes (Stephenson & Tsui, 2002). This belief was also highlighted by Vikram and colleagues (2012) who suggested that membership with religious or caste organizations in India may reinforce traditional attitudes about the use of preventive care and discourage mothers from seeking immunizations for their children.

Surprisingly, the current study found that the effect of bonding social capital on health care utilization was not always negative and involved complex interactions. Contrary to the second hypothesis, this study showed that women who lived in communities with more intragroup bonding ties had higher odds of using a doctor, nurse, or midwife during delivery. The differential effect of intragroup bonding ties is likely due to differences in the types of health services being utilized. Skilled delivery care differs from antenatal care and immunizations because it often requires substantial financial resources, especially in emergent situations. This

is supported by the notion that, in addition to controlling deviant behavioral norms, bonding social capital is important for "generating mutual aid and protecting the vulnerable (Islam et al., 2006, p.6)." Therefore, bonding social capital may have a positive effect on the use of health services that require significant financial resources, especially in low-resource settings.

This study also confirmed the third hypothesis that social networks—as measured by linking ties with doctors, teachers and government officials—were positively associated with all three types of health services at the community level; however, the association between social networks and health care use was not statistically significant for antenatal care use. Social networks are important for leveraging relationships with individuals who have power and influence within the community, which provides access to new resources, ideas, and information, especially for poor communities (Woolcock, 2001). In a study conducted in the Ivory Coast, Ayé and colleagues (2002) found that the existence of a support network was positively associated with an individual receiving financial assistance for accessing health care when ill. Furthermore, partnerships between health care providers and underserved communities can improve access to primary health care (Derose & Varda, 2009).

The final hypothesis, which stated that social cohesion and collective efficacy were positively associated with all three types of health care utilization, provided the most unexpected results. Collective efficacy—as measured by the bonding of individuals in a community to solve a common problem—was only significantly associated with the use of antenatal care and social cohesion—as measured by the absence of community conflict—was not significantly associated with any type of health care utilization. In addition, the association between collective efficacy and antenatal care use was negative, the opposite of what was expected. The negative association with antenatal care use suggests that collective efficacy has the potential to reinforce

unhealthy behavioral norms through informal social control (Portes, 1998). Therefore, it is important to consider the norms of the community when studying collective efficacy. For example, in a study on collective efficacy and smoking behaviors, Ahern and colleagues (2009) found that higher collective efficacy was associated with more smoking in neighborhoods where smoking norms were permissive. If the use of antenatal care is not perceived as important among individuals in a community, then women who live in these close-knit communities may use less antenatal care.

Previous studies have shown a positive association between collective efficacy and health, where individuals residing in neighborhoods with higher levels of collective efficacy report better health (Browning & Cagney, 2002), lower body mass index (Cohen et al., 2006), and having a regular source of care and preventive checkup (Prentice, 2006). Compared to the current study, the health outcomes from the previous studies were substantively different and the studies were set in culturally different geographic locations. Therefore, it is difficult to compare the findings in the current study to the prior literature on this topic.

Finally, this study showed significant cross-level interactions between all three types of health care utilization and one component of social capital—intragroup bonding ties (Figure 4.2). Women with *low* levels of bonding ties who lived in communities with higher levels of bonding ties had higher odds of health care utilization, compared to similar women living in communities with lower levels of bonding ties. This may be due to the mutual aid made available to women who are particularly marginalized and vulnerable in communities with higher levels of bonding ties. By contrast, women with *high* levels of bonding ties who lived in communities with higher levels of bonding ties had somewhat lower odds of preventive care (antenatal care and immunizations) and no significant difference in the odds of delivery care. This may be due to

behavioral norms being shared more efficiently among women who are embedded in dense networks of religious and caste groups compared to women who are excluded from these groups. Cross-level interactions have been reported in previous studies on social capital and health (Poortinga, 2006a; Subramanian et al., 2002), which emphasizes the importance of examining the relationship between individual access to social capital available within the community.

Policy implications

The policy implications from this study specifically address social capital and health care utilization. The implications may have been considerably different if the focus of the study was on general health and well-being in India. With that said, this study has the potential to make significant contributions to the understanding of the role of social capital in health policy and health promotion interventions related to health care utilization in India due to the nationally representative nature of the IHDS data. First, since social capital was found to operate at the community-level in India, investments in social capital can have significant spillover effects (Carroll, 2001). Those who are directly involved in efforts to build social capital will not be the only ones affected; their family, neighbors and community will also indirectly experience the consequences—both positive and negative. Second, of the six forms of social capital explored in this study, building and strengthening bridging and linking ties had the greatest potential to positively impact health care utilization in India. Promoting diverse, heterogeneous networks that include individuals with decision-making power, may give communities better access to resources and information, as well as more opportunities to voice their claims and negotiate support. Establishing and expanding these diverse networks would be especially beneficial for disadvantaged households that have few assets and little access to services, thus reducing health

care inequities (Carroll, 2001; Wakefield & Poland, 2005). Third, negative aspects of social capital have the potential to further marginalize disadvantaged populations in India and, therefore, cannot be ignored. Aspects of social capital that reinforce behavioral norms, such as bonding ties and collective efficacy, are not necessarily "bad" for the health of the community. In fact, a positive shift in normative behavior towards the use of necessary preventive care could transform bonding capital into a valuable resource. In this case, careful attention must be paid to addressing the norms about the use of antenatal care and immunizations before building or strengthening bonding ties and collective efficacy in India. Finally, it is important to remember that each state in India has a distinct social and cultural environment. Therefore, any intervention designed to address social capital should be tailored to the unique environment in which it is to be implemented and should be evaluated to determine its effectiveness.

Limitations

There are several limitations to this study. First, this study was not designed to infer a causal association due to the retrospective, cross-sectional nature of the data. Since reports about social capital relate to the time of the survey and the maternal and child health care questions relate to a time in the past five years, it is difficult to determine whether aspects of social capital (i.e., group membership, feelings about the community), had preceded the birth or immunization of their youngest child. Second, complete case analysis was used, excluding women with item missing data from our sample (see Appendix 1 for an analysis of missing values). This was particularly important for the analysis of complete childhood immunization, since the women with missing immunization data appear to be systematically different from those without missing immunization data. Therefore, the results for complete childhood immunization may be biased

towards more educated and wealthier women and households. Third, there is debate about the most appropriate way to measure social capital at the community level. This study uses the group mean of aggregated individual measures of social capital; however, this may not be an accurate representation of social capital at the contextual level (Poortinga, 2012). Although it has been suggested that ecological variables for social capital should be used (Harpham et al., 2002), efforts to find reliable measures of group-level variables (with no individual level analogues) have not been successful. Fourth, the questions about structural social capital (i.e., civic participation, political participation, and social networks) typically ask about the household. Therefore, social capital was not always attributed to the woman who gave birth in the last five years because she may have been reporting about other household members. In addition, previous studies have shown differential effects of social capital by gender (Chuang & Chuang, 2008), therefore it is important to know who has access to household-level social capital and how gender affects maternal and child health service use. Finally, although the multilevel models used in this study were able to explain a substantial proportion of the individual variance in all three outcomes (13% to 38% decline in ICC), a significant amount of unexplained variance remained at the community and state level. In order to test for other sources of unexplained variance at the state-level, I added a state-level fixed effect for gross domestic product (GDP) per capita to Model 6. However, there was no significant effect of GDP per capita on each type of health care utilization (data not shown). Therefore, state-level variation may be due to unobserved differences not accounted for in the models used in this study, such as health financing and other social and economic policies that affect health care utilization. At the community level, I tested the effect of the presence of a health facility in the village and found it to have little explanatory power and to be collinear with village infrastructure (data not shown).

Therefore, the unexplained variance in the use of health services at the community-level may be due to factors related to shared attitudes and beliefs about health services.

Conclusion

This is the first multilevel study of social capital and health care utilization in India, a country with disparate maternal and child health service utilization rates. Using a multilevel framework, this study showed that social capital had an independent, contextual effect on maternal and child health care utilization, beyond the characteristics of individuals belonging to a community. Furthermore, this study showed significant variation in individual health care utilization at the individual, community and state levels. Finally, the association between social capital and health service utilization varied by the type of care utilized. Components of social capital that led to diverse, heterogeneous ties were positively associated with all three types of health services. However, components of social capital that led to strong bonding ties were negatively associated with use of preventive care, but positively associated with the use of skilled delivery care. Given the potential for social capital to reduce inequalities in health care utilization in India, there is a need for intervention studies to examine whether social capital can be increased or strengthened and, if so, whether the increased social capital leads to better health care use.

References

Ahern, J., Galea, S., Hubbard, A., Syme, S.L., 2009. Neighborhood smoking norms modify the relation between collective efficacy and smoking behavior. *Drug and Alcohol Dependence*, 100, 138-145.

Ayé, M., Champagne, F., and Contandriopoulos, A. P., 2002. Economic role of solidarity and social capital in accessing modern health care services in the Ivory Coast. *Social Science and Medicine*, 55, 1929-1946.

Bain K, Hicks N. Building social capital and reaching out to excluded groups: The challenge of partnerships. Paper presented at CELAM meeting on The Struggle Against Poverty Towards the Turn of the Millennium, Washington, DC 1998.

Balarajan, Y., Selvaraj, S., Subramanian, S., 2011. Health care and equity in India. *The Lancet*, 377, 505-515.

Bourdieu, P., 1986. The forms of capital. In J. G. Richardson (Ed), *Handbook of theory and research for the sociology of education*. New York, Greenwood Press, pp. 241-258.

Browning, C.R., Cagney, K.A., 2002. Neighborhood structural disadvantage, collective efficacy, and self-rated physical health in an urban setting. *Journal of Health and Social Behavior*, 43, 383-398.

Campbell, O.M.R., and Graham, W.J., 2006. Strategies for reducing maternal mortality: getting on with what works. *The Lancet*, 368, 1284-1299.

Carpiano, R.M., 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62, 165-175.

Carpiano, R.M., 2007. Neighborhood social capital and adult health: An empirical test of a Bourdieu-based model. *Health and Place*, 13, 639-655.

Carroll, T.F., 2001. Social capital, local capacity building and poverty reduction. Social Development Papers No. 3, Office of Environmental and Social Development, Asian Development Bank.

Chuang, Y.-C., Chuang, K.-Y., 2008. Gender differences in relationships between social capital and individual smoking and drinking behavior in Taiwan. *Social Science and Medicine*, 67, 1321-1330.

Cohen, D.A., Finch, B.K., Bower, A., Sastry, N., 2006. Collective efficacy and obesity: The potential influence of social factors on health. *Social Science and Medicine*, 62, 769-778.

Coleman, J. S., 1988. Social capital in the creation of human capital. *American Journal of Sociology*, 94(Suppl.), S95-S120.

Cornish, F., Shukla, A., Banerji, R., 2010. Persuading, protesting and exchanging favors: Strategies used by Indian sex workers to win local support for their HIV prevention programs. *AIDS Care*, 22, 1670-1678.

De Clercq, B., Vyncke, V., Hublet, A., Elgar, F.J., Ravens-Sieberer, U., Currie, C., Hooghe, M., Ieven, A., Maes, L., 2012. Social capital and social inequality in adolescents' health in 601 Flemish communities: A multilevel analysis. *Social Science and Medicine,* 74, 202-210.

De Silva, M.J., Huttly, S.R., Harpham, T., Kenward, M.G., 2007a. Social capital and mental health: A comparative analysis of four low income countries. *Social Science and Medicine,* 64, 5-20.

De Silva, M.J. and Harpham, T., 2007b. Maternal social capital and child nutritional status in four developing countries. *Health and Place,* 13, 341-355.

Derose, K. and Varda, D.M., 2009. Social capital and health care access: A systematic review. *Medical Care Research and Review,* 66, 272-306.

Desai, S. and Wu, L., 2010. Structured inequalities—Factors associated with spatial disparities in maternity care in India. *The Journal of Applied Economic Research*, 4, 293-319.

Desai, S., Vanneman, R., and National Council of Applied Economic Research, New Delhi. India Human Development Survey (IHDS), 2005 [Computer file]. ICPSR22626-v8. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2010-06-29. doi:10.3886/ICPSR22626.v8

Diez-Roux, A. V., 2002. A glossary for multilevel analysis. *Journal of Epidemiology and Community Health*, 56, 588–594.

Diez-Roux, A.V., 2000. Multilevel analysis in public health research. *Annual Review of Public Health*, 21, 171-192.

Eriksson, M., Ng, N., Weinehall, L., Emmelin, M., 2011. The importance of gender and conceptualization for understanding the association between collective social capital and health: A multilevel analysis from northern Sweden. *Social Science and Medicine*, 73, 264-273.

Fabrigar, L.R., MacCallum, R.C., Wegener, D.T., Strahan, E.J., 1999. Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4, 272-299.

Gittell, R. and Vidal, R., 1998. Community Organizing: Building Social Capital as a Development Strategy. Thousand Oakes, CA, Sage Books.

Granovetter, M., 1983. The strength of weak ties: A network theory revisited. *Sociological Theory*, 1, 201-233.

Grootaert, C., and van Bastelaer, T., 2001. Understanding and measuring social capital: A synthesis of findings and recommendations from the Social Capital Initiative. Washington, DC: World Bank.

Hamano, T., Fujisawa, Y., Ishida, Y., Subramanian, S.V., Kawachi, I., Shiwaku, K., 2010. Social capital and mental health in Japan: A multilevel analysis. *PLoS ONE*, 5, e13214

Han, S., 2013. Compositional and contextual associations of social capital and self-rated health in Seoul, South Korea: A multilevel analysis of longitudinal evidence. *Social Science and Medicine*, 80, 113-120.

Harpham, T., 2008. The measurement of community social capital through surveys. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*. New York, NY, Springer, pp. 51-62.

Harpham, T., Grant, E., and Thomas, E., 2002. Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17, 106–111.

Hazarika, I., 2012. India at the crossroads of millennium development goals 4 and 5. *Asia-Pacific Journal of Public Health*, 24, 450-463.

Hurtado, D., Kawachi, I., Sudarsky, J., 2011. Social capital and self-rated health in Colombia: The good, the bad and the ugly. *Social Science and Medicine*, 72, 584-590.

Islam, M.K., Merlo, J., Kawachi, I., Lindström, M., Gerdtham, U.-G., 2006. Social capital and health: Does egalitarianism matter? A literature review. *International Journal for Equity in Health*, 5, 3.

Jones, G., Steketee, R.W., Black, R.E., Bhutta, Z.A., Morris, S.S., 2003. How many child deaths can we prevent this year? *The Lancet*, 362, 65-71.

Kawachi, I. and Berkman, L., 2000. Social cohesion, social capital, and health. In: L. Berkman and I. Kawachi (Eds), Social Epidemiology, New York, NY: Oxford University Press, pp. 174-190.

Kawachi, I., Subramanian, S.V., and Kim, D., 2008. Social capital and health: A decade of progress and beyond. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 1-26.

Kawachi, I., 2010. Social capital and health. In: C. Bird, P. Conrad, A. M. Fremont, and S. Timmermans (Eds), *Handbook of Medical Sociology*, 6th Edition, Nashville, Vanderbilt University Press, pp. 18-32.

Kim, D., Subramanian, S.V., Kawachi I., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 139-190.

Kumar, A.K.S., Chen, L.C., Choudhury, M., Ganju, S., Mahajan, V., Sinha, A., Sen, A., 2011. Financing health care for all: Challenges and opportunities. *The Lancet*, 377, 668-679.

Lochner, K., Kawachi, I., Kennedy, B.P., 1999. Social capital: A guide to its measurement. *Health and Place*, 5, 259-270.

Ministry of Health and Family Welfare, 2005. Background papers of the National Commission on Macroeconomics and Health: Financing and delivery of health care services in India. New Delhi: Government of India.

Mohnen, S.M., Groenewegen, P.P., Völker, B., Flap, H., 2011. Neighborhood social capital and individual health. *Social Science and Medicine*, 72, 660-667.

Murayama, H., Wakui, T., Arami, R., Sugawara, I., Yoshie, S., 2012. Contextual effect of different components of social capital on health in a suburban city of the greater Tokyo area: A multilevel analysis. *Social Science and Medicine*, 75, 2472-2480.

Navaneetham, K., Dharmalingam, A., 2002. Utilization of maternal health care services in Southern India. *Social Science and Medicine*, 55, 1849-1869.

Paek, H.-J., Lee, B., Salmon, C.T., Witte, K., 2008. The contextual effects of gender norms, communication, and social capital on family planning behaviors in Uganda: A multilevel approach. *Health Education and Behavior*, 35, 461-477.

Perry, M., Williams, R.L., Wallerstein, N., Waitzkin, H., 2008. Social capital and health care experiences among low-income individuals. *American Journal of Public Health*, 98, 330-336.

Poortinga, W., 2006a. Social capital: An individual or collective resource for health? *Social Science and Medicine*, 62, 292-302.

Poortinga, W., 2006b. Social relations or social capital? Individual and community health effects of bonding social capital. *Social Science and Medicine*, 63, 255-270.

Poortinga, W., 2012. Community resilience and health: The role of bonding, bridging, and linking aspects of social capital. *Health and Place*, 18, 286-295.

Portes, A., 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.

Prentice, J. C., 2006. Neighborhood effects on primary care access in Los Angeles. *Social Science and Medicine*, 62, 1291-1303.

Putnam, R.D., 1993. The prosperous community: Social capital and public life. *The American Prospect*, 38.

Rabe-Hesketh, S., and Skrondal, A., 2012. Multilevel and longitudinal modeling using Stata. In: *Categorical responses, counts and survival*, Vol. II. Texas: Stata Press.

Sivaram, S., Zelaya, C., Srikrishnan, A.K., Latkin, C., Go, V.F., Solomon, S., Celentano, D., 2009. Associations between social capital and HIV stigma in Chennai, India: Considerations for prevention intervention design. *AIDS Education and Prevention*, 21, 233-250.

Sokhey, J., Kim-Farley, R.J., Bhargava, I., 1989. The expanded program on immunization: a decade of progress in India. *Annals of Tropical Pediatrics*, 9, 24-29.

Stephenson, R., Tsui, A.O., 2002. Contextual influences on reproductive health service use in Uttar Pradesh, India. *Studies in Family Planning*, 33, 309-320.

Subramanian, S. V., Kim, D. J., and Kawachi, I., 2002. Social trust and self-rated health in US communities: A multilevel analysis. *Journal of Urban Health*, 79, S21–S34.

Sunil, T.S., Rajaram, S., Zottarelli, L.K., 2006. Do individual and program factors matter in the utilization of maternal care services in rural India? A theoretical approach. *Social Science and Medicine*, 62, 1943-1957.

Szreter, S. and Woolcock, M., 2004. Health by association? Social capital, social theory and the political economy of public health. *International Journal of Epidemiology*, 33, 650-667.

Vikram, K., Vanneman, R., Desai, S., 2012. Linkages between maternal education and childhood immunization in India. *Social Science and Medicine*, 75, 331-339.

Wakefield, S.E. and Poland, B., 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60, 2819-2832.

World Health Organization, 2005. World Health Report 2005: Make every mother and child count. Geneva: WHO.

Woolcock, M., 2001. The place of social capital in understanding social and economic outcomes. *Isuma Canadian Journal of Policy Research*, 2, 11-17.

Figure 4.1. Conceptual framework for the relationship between social capital and maternal and child health care utilization in India (Grey box = decrease in health service utilization).

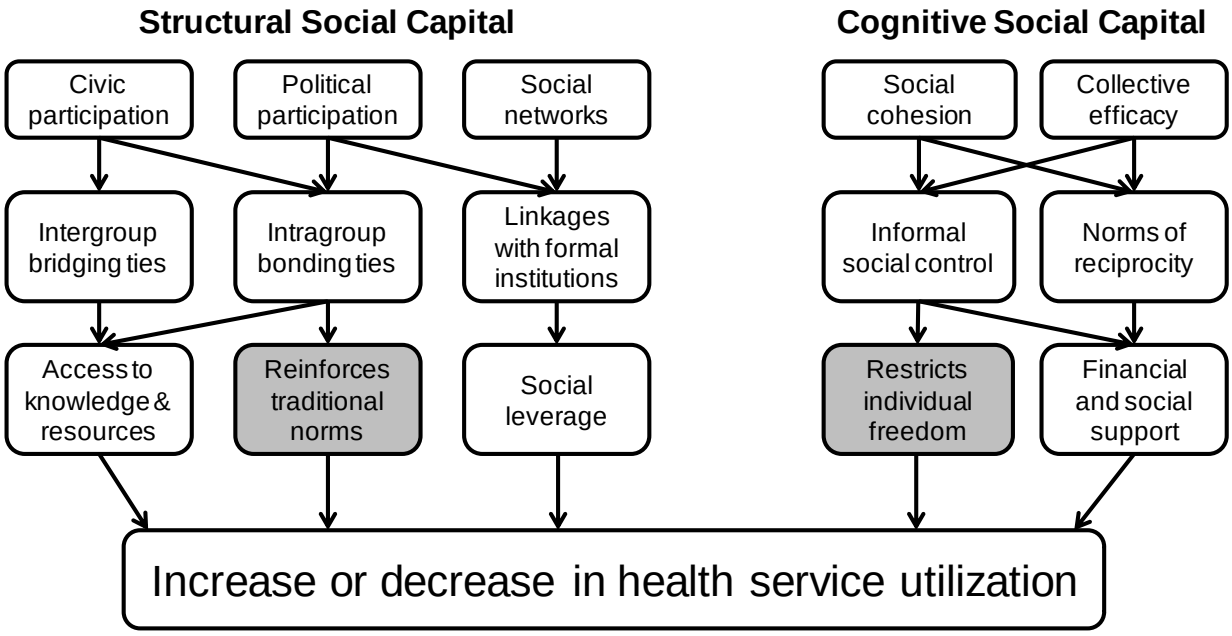


Table 4.1. Summary statistics for ever-married women age 15-49 and their communities from the India Human Development Survey, 2005

	N	Mean (S.D.)	Min.	Max.
Outcome variables				
Four or more antenatal care visits	9,970	0.40 (0.49)	0	1
Skilled birth attendant at delivery	9,970	0.55 (0.50)	0	1
Complete childhood immunization	6,858	0.56 (0.50)	0	1
Individual- and household-level explanatory variables				
Parity	9,970	1.41 (0.58)	1	5
Previous complication	9,970	0.19 (0.39)	0	1
Child's age	6,858	2.7 (1.1)	1	5
Female child	6,858	0.46 (0.50)	0	1
Mother's age	9,970	27.4 (5.6)	15	49
Mother's education				
None	9,970	0.43 (0.49)	0	1
1-9 std	9,970	0.35 (0.48)	0	1
10 std-College grad	9,970	0.22 (0.41)	0	1
Husband's education				
None	9,970	0.23 (0.42)	0	1
1-9 std	9,970	0.42 (0.49)	0	1
10 std-College grad	9,970	0.35 (0.48)	0	1
Caste				
Brahmin	9,970	0.05 (0.21)	0	1
Other Backward Classes	9,970	0.40 (0.49)	0	1
Scheduled Castes	9,970	0.22 (0.41)	0	1
Scheduled Tribes	9,970	0.09 (0.29)	0	1
Other	9,970	0.24 (0.43)	0	1
Household asset score	9,970	11.3 (6.1)	0	30
Social capital				
Intergroup bridging ties	9,970	0 (1.0)	-1.1	6.7

Intragroup bonding ties	9,970	0 (1.0)	-1.2	4.0
Political participation	9,970	0 (1.0)	-1.2	4.4
Social networks	9,970	0 (1.0)	-1.0	3.8
Social cohesion	9,970	0 (1.0)	-3.1	1.2
Collective efficacy	9,970	0 (1.0)	-3.1	1.8
Community-level explanatory variables				
Social capital				
Intergroup bridging ties	1,800	0 (1.0)	-1.4	5.8
Intragroup bonding ties	1,800	0 (1.0)	-1.2	4.1
Political participation	1,800	0 (1.0)	-2.2	4.8
Social networks	1,800	0 (1.0)	-1.4	5.1
Social cohesion	1,800	0 (1.0)	-3.7	1.5
Collective efficacy	1,800	0 (1.0)	-3.6	1.8
Mean household asset score	1,800	11.3 (4.7)	2	27
Area of residence				
Urban	1,800	0.33 (0.47)	0	1
Rural – High infrastructure	1,800	0.27 (0.44)	0	1
Rural – Low infrastructure	1,800	0.40 (0.49)	0	1

Table 4.2. Model comparisons for fixed and random effects estimates (odds ratios) for four or more antenatal care visits, India Human Development Survey, 2005

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6[a]
Fixed effects						
Individual- and household-level explanatory variables						
Parity		0.73***	0.74***	0.74***	0.74***	0.74***
Previous complication		1.13	1.13	1.12	1.13	1.12
Mother's age		1.06	1.03	1.03	1.03	1.03
Mother's education ("None" omitted)						
1-9 std		1.42***	1.40***	1.37***	1.37***	1.37***
10 std-College grad		2.88***	2.75***	2.67***	2.62***	2.61***
Husband's education ("None" omitted)		1.13	1.14	1.15	1.14	1.14
1-9 std		1.33**	1.40**	1.40**	1.37**	1.37**
10 std-College grad						
Caste ("Brahmin" omitted)						
Other Backward Classes		0.70*	0.72*	0.72*	0.73*	0.74*
Scheduled Castes		0.67*	0.66*	0.66*	0.67*	0.68*
Scheduled Tribes		0.40***	0.45***	0.46***	0.46***	0.47***
Other		0.67*	0.68*	0.68*	0.69*	0.70*
Household asset score		1.11***	1.07***	1.07***	1.07***	1.07***
Social capital						
Intergroup bridging ties					0.98	0.96
Intragroup bonding ties					1.00	1.07
Political participation					1.01	1.03
Social networks					1.10*	1.08
Social cohesion					1.04	1.00
Collective efficacy					0.97	0.98
Community-level explanatory variables						
Mean household asset score			1.10**	1.08***	1.09***	1.09***
Area of residence ("Urban" omitted)						
Rural – High infrastructure			1.09	1.00	1.00	0.99
Rural – Low infrastructure			0.83	0.76	0.77	0.77
Social capital						
Intergroup bridging ties				1.23***	1.25***	1.20**
Intragroup bonding ties				0.79***	0.78***	0.86*
Political participation				1.07	1.06	1.07
Social networks				1.11	1.05	1.03
Social cohesion				1.10*	1.07	1.04
Collective efficacy				0.87**	0.89*	0.90*
Random effects						
Level 3: State variation	3.37	2.54	2.36	2.09	2.11	2.12
ICC	0.37	0.35	0.34	0.31	0.32	0.32
Level 2: Community variation	2.33	1.41	1.35	1.28	1.29	1.26
ICC	0.63	0.55	0.53	0.51	0.51	0.51
Constant	0.79	0.16*	0.11**	0.15*	0.15*	0.15*
AIC	9839.2	8941.0	8875.1	8841.6	8846.0	8838.0
LL	-4916.6	-4454.5	-4418.6	-4395.8	-4392.0	-4382.0
LR Tests	--	M1 vs. M2 924.2(13df) p<0.001	M2 vs. M3 71.8(3df) p<0.001	M3 vs. M4 45.5(6df) p<0.001	M4 vs. M5 7.6(6df) p=0.268	M5 vs. M6 20.0(6df) p=0.003

[a] Model 6 includes six interaction terms between individual- and community-level social capital scores.

Note: There were 9,970 total observations within 1,800 communities. * p<0.05, ** p<0.01, *** p<0.001; -- = Not applicable

Table 4.3. Model comparisons for fixed and random effects estimates (odds ratios) for skilled delivery care, India Human Development Survey, 2005

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6[a]
Fixed effects						
Individual- and household-level explanatory variables						
Four or more ANC visits		3.30***	3.11***	3.15***	3.15***	3.13***
Parity		0.81***	0.81***	0.81***	0.81***	0.81***
Previous complication		1.12	1.11	1.10	1.10	1.10
Mother's age		0.90**	0.88**	0.88**	0.88**	0.88**
Mother's education ("None" omitted)						
1-9 std		1.63***	1.61***	1.59***	1.59***	1.59***
10 std-College grad		2.91***	2.82***	2.77***	2.74***	2.72***
Husband's education ("None" omitted)		0.99	1.01	1.00	1.00	1.00
1-9 std		1.07	1.15	1.13	1.13	1.13
10 std-College grad						
Caste ("Brahmin" omitted)						
Other Backward Classes		0.65**	0.65**	0.66**	0.67*	0.67*
Scheduled Castes		0.72*	0.69*	0.69*	0.70*	0.70*
Scheduled Tribes		0.35***	0.40***	0.39***	0.39***	0.40***
Other		0.75	0.73	0.74	0.75	0.75*
Household asset score		1.14***	1.09***	1.10***	1.09***	1.09***
Social capital						
Intergroup bridging ties					1.07	1.05
Intragroup bonding ties					0.96	1.02
Political participation					1.01	1.00
Social networks					1.03	1.02
Social cohesion					0.97	0.97
Collective efficacy					0.95	0.95
Community-level explanatory variables						
Mean household asset score			1.10***	1.09***	1.09***	1.09***
Area of residence ("Urban" omitted)						
Rural – High infrastructure			0.89	0.83	0.83	0.83
Rural – Low infrastructure			0.76*	0.71*	0.71*	0.71*
Social capital						
Intergroup bridging ties				1.15*	1.10	1.08
Intragroup bonding ties				1.06	1.10	1.18**
Political participation				0.96	0.96	0.95
Social networks				1.16**	1.14*	1.14*
Social cohesion				0.91*	0.93	0.92
Collective efficacy				1.05	1.09	1.08
Random effects						
Level 3: State variation	2.13	0.93	0.93	0.85	0.85	0.84
ICC	0.28	0.18	0.18	0.17	0.17	0.16
Level 2: Community variation	2.14	1.04	1.00	0.96	0.97	0.95
ICC	0.56	0.37	0.37	0.36	0.36	0.35
Constant	2.08*	1.82	1.46	1.81	1.81	1.85
AIC	11064.8	9377.9	9285.6	9271.0	9276.6	9281.9
LL	-5529.4	-4671.9	-4622.8	-4609.5	-4606.3	-4603.0
LR Tests	--	M1 vs. M2	M2 vs. M3	M3 vs. M4	M4 vs. M5	M5 vs. M6
		1715(14df)	98.2(3df)	26.7(6df)	6.4(6df)	6.7(6df)
		p<0.001	p<0.001	p<0.001	p=0.385	p=0.353

[a] Model 6 includes six interaction terms between individual- and community-level social capital scores.

Note: There were 9,970 total observations within 1,800 communities. * p<0.05, ** p<0.01, *** p<0.001; -- = Not applicable

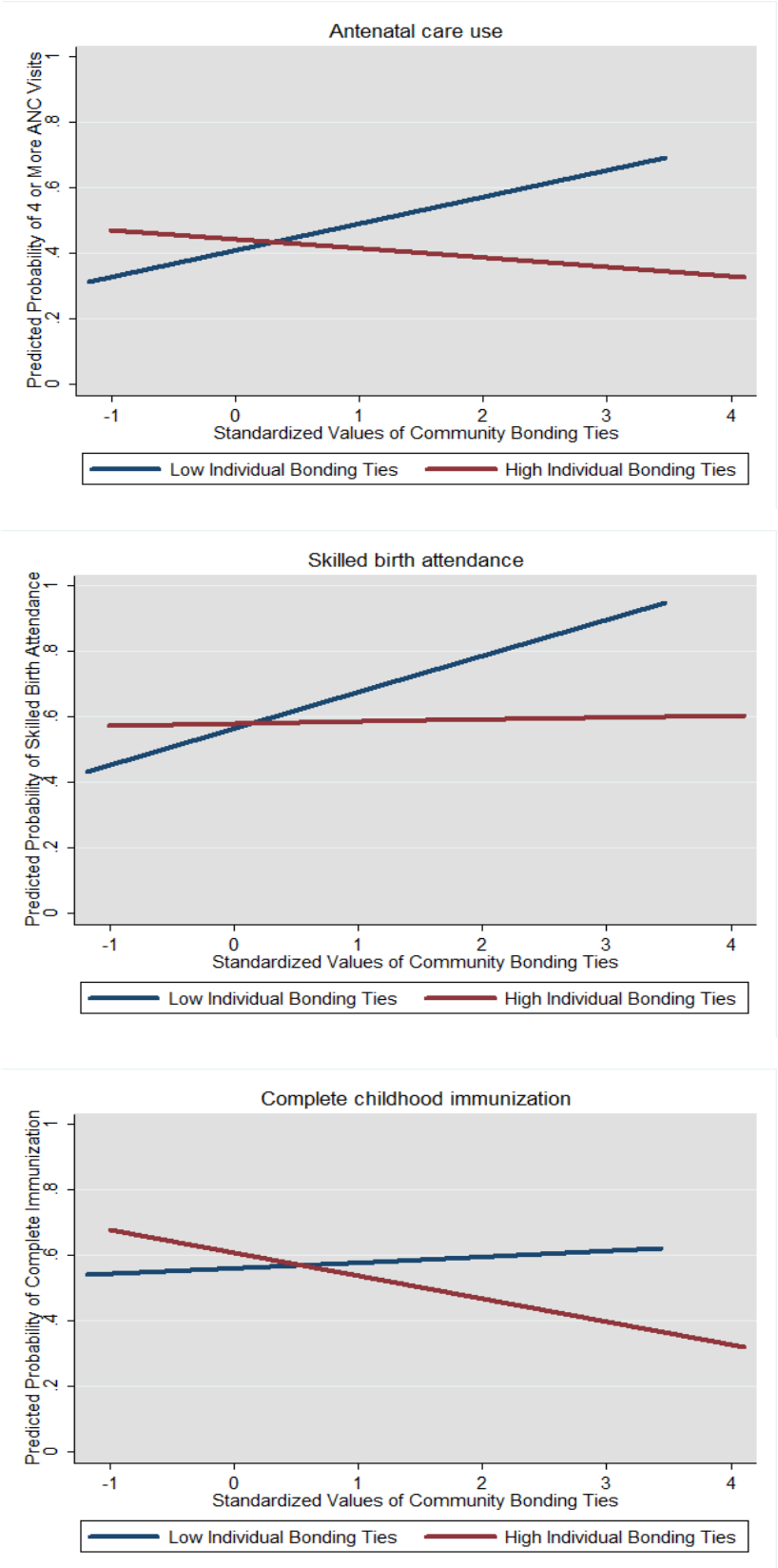
Table 4.4. Model comparisons for fixed and random effects estimates (odds ratios) for complete childhood immunization, India Human Development Survey, 2005

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6[a]
Fixed effects						
Individual- and household-level explanatory variables						
Child's age		1.78***	1.77***	1.80***	1.81***	1.80***
Female child		0.87*	0.87*	0.87*	0.87*	0.86*
Mother's age		1.08	1.08	1.08	1.07	1.07
Mother's education ("None" omitted)						
1-9 std		1.48***	1.48***	1.46***	1.46***	1.45***
10 std-College grad		1.89***	1.90***	1.82***	1.77***	1.76***
Husband's education ("None" omitted)		1.15	1.15	1.15	1.15	1.14
1-9 std		1.48**	1.46**	1.43**	1.42**	1.40**
10 std-College grad						
Caste ("Brahmin" omitted)						
Other Backward Classes		1.01	1.01	1.02	1.02	1.04
Scheduled Castes		0.97	0.98	0.98	0.98	0.99
Scheduled Tribes		1.05	1.06	1.07	1.08	1.10
Other		0.91	0.92	0.94	0.94	0.95
Household asset score		1.07***	1.08***	1.08***	1.07***	1.07***
Social capital						
Intergroup bridging ties					1.12*	1.11
Intragroup bonding ties					0.96	1.03
Political participation					1.01	1.01
Social networks					1.09	1.12*
Social cohesion					0.96	0.99
Collective efficacy					1.02	1.01
Community-level explanatory variables						
Mean household asset score			1.01	0.99	1.00	1.00
Area of residence ("Urban" omitted)						
Rural – High infrastructure			1.62**	1.48**	1.48**	1.47**
Rural – Low infrastructure			1.29	1.18	1.18	1.18
Social capital						
Intergroup bridging ties				1.37***	1.27**	1.26**
Intragroup bonding ties				0.78***	0.80**	0.85*
Political participation				0.94	0.93	0.93
Social networks				1.23**	1.16*	1.18*
Social cohesion				0.92	0.95	0.96
Collective efficacy				1.11	1.09	1.09
Random effects						
Level 3: State variation	1.95	1.73	1.68	1.21	1.22	1.22
ICC	0.27	0.25	0.24	0.19	0.19	0.19
Level 2: Community variation	2.00	1.94	1.92	1.86	1.86	1.83
ICC	0.55	0.53	0.52	0.48	0.48	0.48
Constant	1.67	0.06**	0.04***	0.06**	0.06**	0.07**
AIC	7722.6	7389.0	7384.8	7354.2	7356.8	7356.3
LL	-3858.3	-3677.5	-3672.4	-3651.1	-3646.4	-3640.1
LR Tests	--	M1 vs. M2	M2 vs. M3	M3 vs. M4	M4 vs. M5	M5 vs. M6
		361.6(14df)	10.2(3df)	42.6(6df)	9.5(6df)	12.5(6df)
		p=0.001	p=0.017	p<0.001	p=0.149	p=0.052

[a] Model 6 includes six interaction terms between individual- and community-level social capital scores.

Note: There were 6,858 total observations within 1,766 communities. * p<0.05, ** p<0.01, *** p<0.001; -- = Not applicable

Figure 4.2. Cross-level interaction effects of intragroup bonding ties and each form of health service utilization.



Appendix 1: Analysis of item missing data

The Tables 4.5 and 4.6 show that the most frequent missing value across all respondents was complete childhood immunization (10.6%). Therefore, the regression models for maternal health care use outcomes (antenatal care and skilled delivery care) are not missing this data. Of the other variables used all three regression models, none were missing more than 3.3% of the sample.

Table 4.5. Missing values for ***maternal health outcomes*** and explanatory variables

Variable	Number of missing values	Percent of total
Outcome variables		
Four or more antenatal care visits	186	1.7%
Skilled birth attendant at delivery	123	1.1%
Explanatory variables		
Parity	0	0%
Previous complication	0	0%
Age of mother	1	> 0.01%
Mother's education	170	1.5%
Husband's education	270	2.4%
Caste	0	0%
Household asset score	0	0%
Social capital	356	3.2%
Area of residence	186	1.7%

Note: There were 11,105 total observations

Table 4.6. Missing values for ***child health outcome*** and explanatory variables

Variable	Number of missing values	Percent of total
Outcome variables		
Complete childhood immunization	896	10.6%
Explanatory variables		
Age of child	0	0%
Sex of child	0	0%
Age of mother	0	0%
Mother's education	140	1.7%
Husband's education	223	2.6%
Caste	0	0%
Household asset score	0	0%
Social capital	268	3.3%
Area of residence	149	1.8%

Note: There were 8,423 total observations

Table 4.7 compares basic descriptive statistics for the women who were *not* missing data on childhood immunization to those who were missing data on childhood immunization.

Compared to women who did not have missing data on childhood immunization, women who were missing this data had younger children, were less educated, had husbands who were less educated, were of lower caste, had a lower household asset score, and had different social capital scores (some were higher and some were lower). This means that bias may have been introduced into the estimates for complete childhood immunization.

Table 4.7. Descriptive statistics for individuals with missing and non-missing data on immunization status

Variable	Non-Missing (Mean)	Missing (Mean)	p-value
Age of child*	2.68	2.44	> 0.001
Female child	0.457	0.424	0.061
Age of mother	28.01	27.90	0.585
Mother's education*	4.73	3.89	> 0.001
Husband's education*	6.95	6.08	> 0.001
Caste*	3.05	3.18	0.006
Household asset score*	11.20	10.16	> 0.001
Intragroup bonding ties*	0.086	0.095	0.046
Intergroup bridging ties*	0.145	0.106	> 0.001
Political participation*	0.210	0.182	0.036
Social cohesion	1.743	1.735	0.706
Collective efficacy*	0.433	0.491	> 0.001
Social networks*	0.393	0.292	> 0.001
Area of residence	2.09	2.15	0.065

Note: There were 8,423 total observations; * $p < 0.05$

Tables 4.8 and 4.9 show that there were 568 observations with only one missing value for the maternal health outcomes and 462 observations with only one missing value for the child health outcome, respectively. These observations were not included in the analysis because only complete cases (observations with no missing values) were included in the final analysis. An analysis of the pattern of missing values (data not shown) revealed that the top three explanatory variables that had missing data were the social capital variables, husband's education, and mother's education. The limitations of conducting listwise deletion of observations are included in the *Limitations* section of this paper.

Table 4.8. Number of missing values per observations among all explanatory variables (Maternal health outcomes)

Number of missing values per obs.	Frequency	Percent
0	10,167	91.6%
1	568	5.1%
2	14	0.1%
3	0	0%
4	0	0%
5	0	0%
6	329	3.0%
7	23	0.2%
8	4	0.04%

Note: There were 11,105 total observations

Table 4.9. Number of missing values per observations among all explanatory variables (Child health outcome)

Number of missing values per obs.	Frequency	Percent
0	7,679	91.2%
1	462	5.5%
2	14	0.2%
3	0	0%
4	0	0%
5	0	0%
6	248	2.9%
7	18	0.2%
8	2	0.02%

Note: There were 8,423 total observations

Appendix 2: Exploratory factor analysis for social capital

Exploratory factor analysis was used to uncover the underlying components of social capital in the India Human Development Survey. Confirmatory factor analysis and structural equation modeling techniques were not used in this study because I was not testing hypotheses about the relationships between specific components of social capital and the questions used to assess social capital. The components of social capital identified through exploratory factor analysis can be used in the regression models to assess the relationship between each component of social capital and health care utilization.

In order to conduct the exploratory factor analysis, each of the 18 social capital survey items was recoded so that a higher value represents a higher level of social capital. Oblique rotation was conducted using a matrix of polychoric correlations between each pair of survey items to allow for possible theoretical correlation between the derived components of social capital. Fifteen survey items with communality greater than 0.6 were retained for the final factor analysis. A low communality may indicate that the survey item is unrelated to the component of interest and shares little in common with other measured items in that component (Fabrigar et al., 1999). Table 4.10 shows the six factors that were identified with Eigenvalues greater than 1; together, these factors explained 82.6% of the total variance in the 15 items.

Table 4.10. Results of factor analysis for social capital survey items from the India Human Development Survey, 2005

Survey item	Bridging ties	Bonding ties	Political part.	Social networks	Social cohesion	Collective efficacy
Does anyone in the household belong to…						
Mahila mandal	**0.836**	-0.085	0.135	-0.004	0.015	0.118
Youth club, sports club, or reading room	**0.568**	0.132	0.019	0.174	-0.004	-0.289
Trade union, business or professional group	**0.464**	0.154	-0.276	0.203	0.052	-0.333
Self help groups	**0.915**	-0.118	0.074	-0.136	-0.014	0.090
Credit or savings group	**0.795**	0.067	-0.006	-0.106	-0.053	0.162
Religious or social group or festival society	-0.119	**0.960**	0.075	0.009	-0.002	0.002
Caste association	0.041	**0.928**	-0.009	-0.085	-0.001	0.097
Attended a public meeting in the last year	0.116	0.083	**0.818**	-0.011	0.039	-0.127
Household member is a government official	0.040	-0.009	**0.800**	0.138	-0.008	-0.040
People generally get along with each other	0.004	0.117	0.052	-0.009	**0.850**	0.093
Community bonds together to solve problems	0.169	0.085	-0.142	0.177	0.036	**0.914**
Jatis generally get along with each other	-0.041	-0.117	-0.020	-0.020	**0.855**	-0.047
Among your acquaintances and relatives, are there any who…						
…are doctors who live in your community	-0.125	-0.015	0.052	**0.858**	-0.031	0.055
…are teachers who live in your community	-0.063	0.064	0.082	**0.849**	-0.050	0.111
…are gov. officials who live in your community	0.047	-0.131	-0.021	**0.834**	0.058	0.043
Eigenvalue	3.15	2.48	1.65	2.46	1.50	1.15
Variance explained	21.0%	16.5%	11.0%	16.4%	10.0%	7.7%

Note: The sample includes all households interviewed with responses for each social capital survey item for a total of 40,328 observations.

Appendix 3: Three-stage formulation of the random intercept models following the notation provided by Rabe-Hesketh & Skrondal (2012)

Level 1 – Individual:

$$\text{logit}\{\Pr(y_{ijk}=1|\pi_{0jk})\} = \pi_{0jk} + \pi_{1jk}ISOCCAP_{ijk} + \pi_{2jk}INDIV_{ijk} + \varepsilon_{ijk}$$

where the intercept π_{0jk} varies for communities *j* and states *k*. Level 1 covariates are denoted by *ISOCCAP* for individual-level social capital and *INDIV* for all other individual-level covariates. ε_{ijk} represents the level 1 idiosyncratic error term.

Level 2 – Community:

$$\pi_{0jk} = \beta_{00k} + \beta_{01k}CSOCCAP_{jk} + \beta_{02k}COMM_{jk} + \zeta^{(2)}_{0jk}$$

$$\pi_{1jk} = \beta_{10k} + \beta_{10k}CSOCCAP_{jk}$$

$$\pi_{2jk} = \beta_{20k}$$

where the intercepts β_{00k}, β_{10k}, and β_{20k} vary by states *k*. Level 2 covariates are denoted by *CSOCCAP* for community-level social capital and *COMM* for all other community-level covariates. A cross-level interaction is introduced by allowing the slope on *ISOCCAP* (π_{1jk}) to be a function of *CSOCCAP*. $\zeta^{(2)}_{0jk}$ represents the level 2 unit-specific error terms.

Level 3 – State:

$\beta_{00k} = \gamma_{000} + \zeta^{(3)}_{00k}$

$\beta_{01k} = \gamma_{010}$

$\beta_{02k} = \gamma_{020}$

$\beta_{10k} = \gamma_{100}$

$\beta_{20k} = \gamma_{200}$

where there are no additional covariates, but a random intercept (β_{00k}) is introduced by adding level 3 unit-specific error terms ($\zeta^{(3)}_{0jk}$).

The composite model can be written as follows:

$$\text{logit}\{\Pr(y_{ijk}=1|\gamma_{ijk})\} = \gamma_{000} + \gamma_{010}CSOCCAP_{jk} + \gamma_{020}COMM_{jk} + \gamma_{100}ISOCCAP_{ijk} + \gamma_{100}(CSOCCAP_{jk} \text{ x } ISOCCAP_{ijk}) + \gamma_{200}INDIV_{ijk} + \varepsilon_{ijk} + \zeta^{(2)}_{0jk} + \zeta^{(3)}_{00k}$$

Chapter 5

Conclusions, Policy Implications, and Future Research Directions

Community-based approaches are critical to the success of health promotion strategies in the developing world because of their focus on creating an enabling environment to support healthy behaviors. However, the process through which community-based health promotion strategies affect health outcomes remains unclear. The concept of social capital has been cited as a useful framework through which the impact of community-based approaches on health outcomes can be better understood (Campbell & Jovchelovitch, 2000; Grootaert & van Bastelaer, 2001). The overall goal of this dissertation is to contribute to the understanding of community-based health promotion by exploring the relationship between social capital and health in the developing world. The three chapters of this dissertation used distinct methodological approaches to examine (1) the association between social capital and physical health in the least developed countries, (2) the content validity of the measurement of social capital in Bangladesh, and (3) the relationship between different components of social capital and the utilization of maternal and child health services in India. Each paper makes unique substantive contributions on its own, but, taken together, the three papers build a case for investments in and future research on social capital and health in the developing world.

The first study, described in Chapter 2, examined the association between social capital and physical health in the least developed countries using a systematic literature review process. The 14 studies reviewed covered outcomes related to sexual health, HIV, diarrheal disease, maternal and child health, and self-rated health. A variety of indicators were used to assess social capital (some of which were of questionable quality), which made it difficult to compare the association between social capital and health across the studies. However, these studies presented evidence for four general conclusions about the relationship between social capital and health: (1) social exclusion was associated with risky sexual behaviors; (2) participation in social groups had a positive effect on the social norms related to sexual behavior and compliance with treatment; (3) measures of cognitive social capital were associated with increases in child nutrition status and decreases in child mortality; and (4) higher levels of cognitive and structural social capital were associated with improvements in self-rated health.

In order to fill the gaps in the existing literature on social capital and health in the developing world, this study suggested three areas of further research: (1) examine the theoretical conceptualization and operationalization of social capital in the developing world; (2) adapt and validate social capital assessment tools for the developing country context; and (3) design sampling strategies to account for the multilevel effect of social capital on health. The next two chapters in this dissertation were initiated based on the latter two recommendations. Chapter 3 was a direct application of the second recommendation (from conception to implementation), and Chapter 4 used one of the only existing multilevel data sets from a lower middle income country to examine the contextual effect of social capital on health care utilization.

The study presented in Chapter 3 examined the validity of a social capital survey instrument in Bangladesh using qualitative methods, including focus group discussions and cognitive interviewing techniques. This was the first known study to use a variety of qualitative survey validation methods to create a contextually appropriate social capital survey instrument for use in Bangladesh. This study highlighted the importance of using cognitive interviewing techniques to ensure that respondents are able to comprehend key terms, recall important information, and identify an appropriate response in surveys about social capital. This study also provided insight regarding three remaining challenges for measuring social capital in general. First, when assessing group membership, it is important to measure both membership and level of involvement. Asking about one's level of involvement is important because belonging to a group does not necessarily imply active involvement—an important means of accessing resources embedded within groups or organizations. Second, generalized trust is difficult to measure and is often inaccurate approximation of relational trust. Therefore, questions about trust should focus on interpersonal trust, which is a better representation of social capital. Third, social capital survey questions need to be tailored to fit the social and political environment in which they are administered. This is especially true in the unique culture created by microfinance institutions in Bangladesh. In this context, questions may need to be rephrased and interviewers may need to probe more frequently to uncover components social capital that are unrelated to economic support.

Once the operational measurement of social capital is better understood in the developing country context, one can start to explore the patterns of association with health and health behaviors. The final empirical study, described in Chapter 4, was the first known study to explore the association between social capital and the utilization of maternal and child health

services in India using a multilevel, nationally representative data set. This study examined whether each form of social capital had an independent, contextual effect on three types of health care use—antenatal care, professional delivery care, and childhood immunizations—beyond the characteristics of individual women belonging to a community. This study provided novel evidence that social capital operates at the community level in association with all three care-seeking behaviors in India. Specifically, communities with more opportunities to establish bridging or linking ties were positively associated with the use of all three types of health services. The positive association of these forms of social capital with health care utilization may be due to more contemporary modes of thought and increased access to health care resources within their social networks. On the other hand, tight-knit communities with more opportunities to establish strong bonding ties were negatively associated with use of preventive care, but positively associated with skilled delivery care. The negative association is likely due to the transmission of traditional behavioral norms that discourage the use of preventive maternal and child health services, a common perception in the South Asian context. Although unexpected, the positive association may be due to the use of bonding ties to generate mutual aid for health services that require significant financial resources. Furthermore, the relationship between health care utilization and bonding ties involved complex interactions, such that individual levels of bonding ties moderate the effect of community-level bonding ties on health care utilization.

This study presented three important implications for health policy and investments in social capital in India. First, since social capital appears to operate as a community-level attribute, investments in social capital can have significant spillover effects, where family, neighbors and other community members can indirectly experience the positive and negative

consequences of social capital. For example, building trust among a portion of the community will affect others who were not included in the trust building efforts. Second, the greatest potential for social capital to positively impact health care utilization in India is likely through building and strengthening bridging and linking ties. Third, negative aspects of social capital have the potential to further marginalize disadvantaged populations in India and, therefore, cannot be ignored.

Taken together, these three empirical studies emphasized the theoretical and operational complexity of the concept of social capital. Although the concept of social capital is complex and often contested (Szreter & Woolcock, 2004), this dissertation showed that distinct components of structural (e.g., group membership, political participation, social networks) and cognitive social capital (e.g., trust, social cohesion, collective efficacy) were relevant for health across multiple cultural contexts. However, the operational measurement of each component of social capital was dependent on the specific cultural context. This supports the reliability of the theoretical components of social capital across time and place as well as the importance of context when validating survey questions to measure each component of social capital. Therefore, conceptual complexity, in and of itself, should not deter people from studying the relationship between social capital and health. Given the right methodological tools, an abstract concept, such as social capital, can be translated into operational measures by dividing it into meaningful components that have analogues across all contexts. Narayan and Cassidy (2001) agree and suggest that "an intermediate step in defining what social capital is and is not is to unbundle the theory into its dimensions (p. 61)." This was especially apparent in Chapter 3 where operational measures for each component of social capital were developed and validated. However, it is not enough to measure different aspects of social capital.

This dissertation also emphasized the importance of differentiating between different components of social capital during the analysis of the concept in order to understand their differential association with health. Prior studies have assessed one aspect of social capital, such as generalized trust (Subramanian et al., 2002), or consolidated measures of social capital into one aggregate construct (Paek et al., 2008). These approaches overlooked the differential effects of the various components of social capital and limited the understanding of the mechanisms through which social capital affects health (Carpiano, 2006; Cook, 2005). The advantage of distinguishing between different components of social capital was particularly evident in Chapters 2 and 4, where differential effects of social capital were examined in relation to various health outcomes. By applying multi-method strategies to the study of social capital and health, the empirical evidence will continue to grow and inform health policy and health promotion interventions.

Policy implications

The implications of this dissertation are relevant to health and social policy at the national and international levels, and to development assistance organizations that are or will be investing in social capital interventions. Both policy-makers and development assistance organizations are often faced with the decision to invest in individual determinants of health or social determinants of health. According to Subramanian (2003), "whether we should target 'people' or 'places' is an emerging policy debate that has implications for the way we design interventions to build social capital." There is significant agreement that the health of individuals is dependent on the cohesiveness of the social environment (Lomas, 1998). However, there is still disagreement about whether social capital operates at the individual level or the collective level. Social capital

is primarily conceptualized as a collective attribute, but it also depends on the resources available to individuals within social groups (Bourdieu, 1986). Therefore, policy-makers and development organizations need to address innovative ways to strengthen community-level aspects of social relationships (social capital), while also making contributions to social resources available within communities (human and economic capital).

This dissertation highlighted two aspects of social relationships that are important to health and development: diverse, heterogeneous social relationships and interpersonal trust. First, as mentioned in Chapter 4, communities with greater resident involvement in diverse, heterogeneous social groups were associated with greater use of maternal and child health services in India. The relationship between heterogeneous social relationships and positive development outcomes has also been reported by other studies in the developing world (Narayan & Cassidy, 2001). The benefits of this component of social capital may be due to increased community linkages with people who have decision-making power, better access to resources and information, or more opportunities for community residents to voice their claims and negotiate support (Islam et al., 2006). Establishing and expanding these diverse networks would be especially beneficial for disadvantaged households that have few assets and little access to health services, thus reducing health care inequities (Carroll, 2001; Wakefield & Poland, 2005). On the other hand, social capital has the potential to further marginalize individuals and households based on who has access to people with decision-making power and community resources (Portes, 1998). It is important to consider other aspects of the social environment when examining the effect of social capital on health, such as gender dynamics and socioeconomic inequalities, to ensure disparities in health and health care do not proliferate due to interventions on social capital.

Second, as described in Chapter 3, interpersonal trust between family, friends, and even local leaders was an important component of social capital in Bangladesh. Interpersonal trust has been cited as critical part of social capital due to the importance of trust and reciprocity for gaining access to resources within one's social networks (Cook, 2005). Living among trusting neighbors has also been shown to be associated with higher self-reported health and lower frequency of unhealthy behaviors (Tampubolon et al., 2013). Although generalized social trust has been commonly used as an indicator of social capital, interpersonal trust is easier to measure and is a better approximation of social capital (Blaxter & Poland, 2002; Cook, 2005).

The resources available within social networks are also important for health and development. First, studies have shown that in order to achieve high levels of development, there is a need for investments in human and physical capital. Social capital provides a way to sustainably manage and equally distribute these resources through social networks and collective action (Grootaert & van Bastelaer, 2001). Therefore, it is important to balance investments in each form of capital. Second, behavioral norms should be considered as a positive or negative resource in each cultural context. Some components of social capital, such as bonding social ties and social cohesion, have the potential to reinforce unhealthy behavioral norms through informal social control (Portes, 1998). On the other hand, if there is a shift towards healthy behavioral norms, such as the use of immunization services, these forms of social capital can have a positive impact. In this case, it is important to balance investments in building social capital with health promotion interventions that promote positive health behaviors.

There is bounded optimism that social capital is the missing link to the relationship between community-based development, health promotion, and improved health outcomes (Grootaert & van Bastelaer, 2001). Proponents of social capital in the fields of public health and

community development advocate for additional research to demonstrate strong links between social capital and health. Woolcock (1998) explains the importance of social capital to the development process, but emphasizes that more research is needed:

> "Social capital is thus a crucial but enigmatic component of the development equation, precisely because it can enhance, maintain, or destroy physical and human capital. The challenge for development theorists and policy-makers alike is to identify the mechanisms that will create, nurture, and sustain the types and combinations of social relationships conducive to building dynamic participatory societies, sustainable equitable economies, and accountable developmental states (p. 186)."

In addition to identifying the mechanisms through which social capital can be successfully built, additional evidence is needed to examine whether social capital leads to improved health outcomes. Progress on these fronts may, in turn, inform policy-makers and development assistance organizations about the potential health impact of investments in the creation of social capital.

Future research directions

Although this dissertation addressed some of the major gaps in the current literature on social capital and health in the developing world, many research priorities remain. First, there is a need to further explore two often overlooked conceptualizations of social capital in the developing world: bonding, bridging, and linking capital and social capital as resources embedded in social networks. Both of these conceptualizations have persisted across time and

context, but few empirical studies have attempted to measure the association between each of these two conceptualizations of social capital and health outcomes in resource-poor countries.

Bonding, bridging, and linking social capital are both theoretically and practically important to health and development in the developing world (Harpham et al., 2002). Bridging and linking capital have the potential to benefit development projects by allowing access to new resources, whereas bonding capital has the potential to lead to negative effects due to restricted freedom and mobility among likeminded groups. There is a need to develop reliable operational measures of these three forms of social capital that can be used across contexts in order to better understand how they affect health outcomes, both positively and negatively.

Bourdieu's conceptualization of social capital as collective resources of groups that can be drawn upon by individual group members has been cited as a valuable theory for network-based social capital. However, this conceptualization has been neglected in studies on social capital and health (Carpiano, 2006). According to Lakon and colleagues (2008) "social network concepts and methodology provide a useful mechanism for measuring social capital (p. 63)." Social network analysis allows one to examine network characteristics as measures of social capital, including the function of network ties (e.g., the resources, information, or influence available in the network), the structure of the connections between different actors in the network (e.g., the size and density of the network), and the actors' positions in a network (e.g., how connected the actor is to others in the network) (Lakon et al., 2008). These concepts and methodologies have the potential to provide a better understanding of Bourdieu's conceptualization of social capital.

Second, there is a need to develop better measures for studying social capital at the community level. Currently, aggregating measures of individual characteristics to the

appropriate geographic area of interest is the most common strategy for assessing social capital as a collective attribute (Harpham et al., 2002). Others have called for the use of community-level variables that do not have an individual-level correlate, such as the existence of certain laws or certain characteristics of the infrastructure (Diez-Roux, 2002). However, these measures are difficult to standardize in an instrument for international use. Ethnographic methods could be used to identify community-level measures of social capital on a country-by-country basis. The new measures could then be pretested prior to inclusion in a survey that has a multilevel sampling strategy.

Third, as described in Chapter 2, some studies have shown an association between different components of social capital and different health outcomes in the developing world, but the direction of causality is unclear. There is a need for longitudinal studies that can examine the timing of the relationship between levels of social capital and health outcomes (Harpham et al., 2002). However, establishing causality remains one of the biggest challenges in the study of social capital and health due to the lack of longitudinal data (Kim et al., 2008). A recent systematic review of the literature on social capital and health found only 13 prospective multilevel studies, none of which were set in the developing world (Murayama et al., 2012). There are two datasets that have (or will have) the capacity to examine the association between social capital and health over time in resource-poor countries: the second wave of the India Human Development Survey and the Young Lives Survey, which was administered in three waves in Ethiopia, India, Peru, and Vietnam. Both datasets contain individual-level and group-level data, which allows one to use a multilevel approach (individuals nested in geographic areas over time) to examine whether prior levels of social capital have a causal and contextual effect on individual health outcomes.

Fourth, there is a need for intervention studies that use mixed-method approaches to examine how social capital affects maternal and child health. This type of study would follow a similar design to the community-based newborn care intervention package implemented in Bangladesh (Baqui et al., 2008). Using a cluster-randomized controlled trial, one could study the effect of different social capital strengthening interventions on various health outcomes. In addition to the quantitative evaluation of intervention effectiveness, qualitative methods could be used to explore the pathways through which social capital affects health.

Taken together, these future research priorities have the potential to make significant contributions to the literature on social capital and health in the developing world by creating new operational measures of social capital that can be used in a variety of cultural contexts, applying new methodologies to help better understand social capital, using multilevel prospective data sets to examine the causal association between social capital and health, and designing social capital intervention studies. This level of evidence will pave the way for community-based development and health promotion strategies to build social capital in communities as a way of enabling the practice of healthy behaviors.

References

Baqui, A.H., El-Arifeen, S., Darmstadt, G.L., Ahmed, S., Williams, E.K., Seraji, H.R., Mannan, I., Rahman, S.M., Shah, R., Saha, S.K., Syed, U., Winch, P.J., Lefevre, A., Santosham, M., Black, R.E. (2008). Effect of community-based newborn-care intervention package implemented through two service-delivery strategies in Sylhet district, Bangladesh: a cluster-randomized controlled trial. *The Lancet*, 371(9628), 1936-1944.

Blaxter, M., and Poland, F., 2002. Moving beyond the survey in exploring social capital. In: Swann, C. and Morgan, A. (Eds.), *Social capital for health: Insights from qualitative research*. London: Health Development Agency, pp. 87-107.

Bourdieu, P., 1986. The forms of capital. In J. G. Richardson (Ed), *Handbook of theory and research for the sociology of education*. New York, Greenwood Press, pp. 241-258.

Campbell, C., & Jovchelovitch, S., 2000. Health, community and development: Towards a social Psychology of participation. *Journal of Community and Applied Social Psychology*, 10(4), 255-270.

Carpiano, R.M., 2006. Towards a neighborhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*, 62, 165-175.

Carroll, T.F., 2001. Social capital, local capacity building and poverty reduction. Social Development Papers No. 3, Office of Environmental and Social Development, Asian Development Bank.

Cook, K.S., 2005. Networks, norms, and trust: The social psychology of social capital. *Social Psychology Quarterly*, 68(1), 4-14.

Diez-Roux, A. V., 2002. A glossary for multilevel analysis. *Journal of Epidemiology and Community Health*, 56, 588–594.

Grootaert, C., and van Bastelaer, T., 2002. Understanding and measuring social capital: A multidisciplinary tool for practitioners. Washington, DC: World Bank.

Harpham, T., Grant, E., and Thomas, E., 2002. Measuring social capital within health surveys: key issues. *Health Policy and Planning*, 17, 106–111.

Islam, M.K., Merlo, J., Kawachi, I., Lindström, M., Gerdtham, U.-G., 2006. Social capital and health: Does egalitarianism matter? A literature review. *International Journal for Equity in Health*, 5, 3.

Kim, D., Subramanian, S.V., Kawachi I., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 139-190.

Lakon, C.M., Godette, D.C., Hipp, J.R., 2008. Social capital and physical health: A systematic review of the literature. In: Kawachi, I., Subramanian, S.V., and Kim D. (Eds), *Social Capital and Health*, New York, NY, Springer, pp. 63-81.

Lomas, J., 1998. Social capital and health: Implications for public health and epidemiology. *Social Science and Medicine*, 47(9), 1181-1188.

Murayama, H., Fujiwara, Y., Kawachi, I., 2012. Social capital and health: A review of prospective multilevel studies. *Journal of Epidemiology*, 22(3), 179-187.

Narayan, D., and Cassidy, M.F., 2001. A dimensional approach to measuring social capital: Development and validation of a social capital inventory. *Current Sociology*, 49(2), 59-102.

Paek, H.J., Lee, B., Salmon, C.T., Witte, K., 2008. The contextual effects of gender norms, communication, and social capital on family planning behaviors in Uganda: A multilevel approach. *Health Education and Behavior*, 35(4), 461-477.

Portes, A., 1998. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*, 24, 1-24.

Subramanian, S.V., Kim, D.J., and Kawachi, I., 2002. Social trust and self-rated health in US communities: A multilevel analysis. *Journal of Urban Health*, 79, S21–S34.

Subramanian, S.V., Lochner, K.A., Kawachi, I., 2003. Neighborhood differences in social capital: A compositional artifact or a contextual construct? *Health and Place*, 9(1), 33-44.

Tampubolon, G., Subramanian, S.V., Kawachi, I., 2013. Neighborhood social capital and individual self-rated health in Wales. *Health Economics (United Kingdom)*, 22(1), 14-21.

Wakefield, S.E. and Poland, B., 2005. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*, 60, 2819-2832.

Woolcock, M., 1998. Social capital and economic development: Toward a theoretical synthesis and policy framework. *Theory and Society*, 27, 151-208.