Published in final edited form as:

Glob Public Health. 2013 ; 8(9): 983–999. doi:10.1080/17441692.2013.842259.

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

William T. Story

Department of Health Management and Policy, University of Michigan, Ann Arbor, MI, 48109-2029, USA Tel.: + 16163894437; Fax: + 17347644338; wstory@umich.edu

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 behaviours) 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 took place 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 appropriate 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.

Keywords

least developed countries; social capital; physical health; health behaviours; review

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). Critics of the recent emergence of social capital 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 and Poland 2005). Although there are differing opinions about the usefulness of the social capital construct, 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 a useful and important area to explore in global public health because (1) it has been linked to decreases in mortality and improved 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, Thomas-Slater and Fisher 2011); and (3) it can be used by the poor as a primary means of protection against risk and vulnerability (Carroll 2001). Before examining the literature on social capital and health, it is important to review the current theoretical conceptualisations of social capital in public health.

Theoretical conceptualisations of social capital

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 behaviours and attitudes that benefit society. These positive collective attributes include interpersonal trust, civic engagement, and norms of reciprocity. Although Putnam's concept of social capital shares similarities with the theories established by Coleman and Bourdieu, he has been criticised for not paying attention to the negative aspects of social capital (Portes 1998). Nonetheless, Putnam's collective conceptualisation 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 conceptualisations of social capital, there has been an effort to categorise the theories mentioned above based on (1) whether it is an individual or a collective attribute (Kawachi 2008, Portes, 2000), (2) whether it is empirically measured as structural or cognitive social capital (Harpham 2002), and (3) whether the social ties represent bonding, bridging, or linking capital (Szreter and Woolcock 2004).

Coleman and 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, Putnam extends the concept of social capital to 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 the same indicator at the collective level (Kim *et al.* 2008). Distinguishing between these two conceptualisations of social capital is also important because they require the selection of different study designs and analytical techniques.

The distinction between structural and cognitive social capital is empirically driven based on the differential impact of each type of social capital on health outcomes (Harpham 2008). Structural social capital focuses on what people 'do' (e.g., group membership and civic participation) and is often objectively verified by assessing individuals' actions and behaviours. Cognitive social capital focuses on what people 'feel' (e.g., social trust, reciprocity, and effective norms) and is often subjectively verified by assessing individuals' attitudes and perceptions. 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.

Lastly, building upon Putnam's theory of social capital, the distinction was made between different types of social ties: bonding, bridging, and linking (Szreter and 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 and Woolcock 2004). The distinction between these types of social ties 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).

Social capital and health in developing countries

There is limited evidence from developing countries on the conceptualisation of social capital and the relationship between different forms of social capital and health, with the majority of the studies taking place in the industrialised country context (Kim *et al.* 2008, Harpham 2002). 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 behaviours) 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 financial 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.

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 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 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 conceptualised and applied the term 'social capital' in research related to health and health behaviours. 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 39 of the 1,066 articles on social capital (3.7%) took place 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 behaviours (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 behaviour 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 standardised 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 took place in Africa (11 in East and Central Africa; one in West Africa) and two took place 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 contextualise the measurement of social capital; however, only two mentioned the validation of the social capital survey instrument. Tables 1 and 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 behaviours. Agardh and colleagues (2010) explored the relationship between social capital and sexual behaviour 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 affect 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 behaviour. At the contextual level, social capital had a negative, but nonsignificant, effect on family planning behaviours after cross-level interactions were included in the model. Djamba (2003) studied the association between household-level social capital and individual sexual behaviours 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 took place

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 diarrhoeal disease. All four studies used qualitative methods to explore the relationship between social capital and health. 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 both aspects of social capital protected against HIV infection by expanding access to formal and informal networks and empowering vulnerable groups to practice safer sexual behaviours. 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 diarrhoeal disease in rural Bangladesh. This study suggested that self-care treatment of diarrhoeal 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. 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 low levels of individual social capital (e.g., social relationships) and low levels of community social capital (e.g., civic participation) were significantly associated with poor quality of life compared to high levels of each form of social capital. 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 utilised 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 a significant effect 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 relationships with their peers) and risky sexual behaviours (Agardh *et al.* 2010, Erulkar and Ferede 2009), which suggests that social exclusion is associated with risky sexual behaviours. However, due to the use of cross sectional study designs in these two studies, it is possible that the directions of the associations are reversed, such that the practice of risky sexual behaviours 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 between measures of cognitive social capital as defined by Putnam (1993), whereas Djamba found a marginal association between 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, 2011, Ware *et al.* 2009, Edgeworth and Collins 2006). Although these studies each assessed social capital in a unique way, they all revealed that participation in social groups had a positive effect on the social norms related to sexual behaviour and compliance with treatment.

The strongest and most consistent associations between various measures of social capital and health come from studies that examined health outcomes rather than health behaviours. Measures of cognitive social capital were associated with increases in child nutrition status (De Silva and 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 neighbours, membership in community organizations, involvement in social networks, and collective actions. Again, 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 these studies differentiate 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 elucidate the causal mechanisms through which social capital affects health in these settings.

Study limitations

There were three major limitations to the studies 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 and 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 conceptualised 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 level (Paek *et al.* 2008, Frumence *et al.* 2010).

There were two primary limitations to the studies that used qualitative data and purposive sampling. First, the results of these studies were not generalisable 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 are proposed.

(1) Examine the theoretical conceptualisation and operationalisation of social capital in the developing country context—The most appropriate theoretical conceptualisation of social capital in the developing world draws upon concepts introduced in the development literature, namely bonding, bridging, and linking social capital (Szreter and 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 behavioural 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 behavioural 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 marginalised 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 behaviours.

Third, a form of bridging social capital that connects people across explicit power gradients in society is called linking capital (Szreter and 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 conceptualise social capital as well as create reliable operational measures of these three 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 cultural 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 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 behaviours 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. 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 sampling strategies that appropriately define the boundaries of the community in order 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 organisations (Szreter and Woolcock 2004). In order to encourage policy-makers and development assistance organisations to invest in innovative ways to strengthen social capital, it is imperative to build an evidence-base for the effect of social capital on health in the developing countries, especially for complex health issues such as HIV and AIDS (Thomas-Slater and Fisher 2011). 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.

Acknowledgements

During the development of this manuscript, W. Story received financial support from the Agency for Healthcare Research and Quality Predoctoral Training Grant and the Rackham Predoctoral Fellowship Program. The author would like to thank Professor Richard M. Carpiano at the University of British Columbia for his guidance and helpful feedback during the development of this manuscript as well as Katie Janda for her excellent research assistance.

References

- Agardh A, Emmelin M, Muriisa R, Ostergren PO. Social capital and sexual behaviour among Ugandan university students. *Global Health Action*. 2010; 3
- Bourdieu, P. The forms of capital.. In: Richardson, JG., editor. *Handbook of theory and research for the sociology of education*. Greenwood Press; New York: 1986. p. 241-258.
- Carroll, TF. Social Development Papers No. 3. Office of Environmental and Social Development, Asian Development Bank; 2001. Social capital, local capacity building and poverty reduction..
- Carpiano RM. Towards a neighbourhood resource-based theory of social capital for health: Can Bourdieu and sociology help? *Social Science and Medicine*. 2006; 62(1):165–175. [PubMed: 15992978]
- Coleman JS. Social capital in the creation of human capital. *American Journal of Sociology*. 1988; 94(Suppl.):S95–S120.
- De Silva MJ, McKenzie K, Harpham T, Huttly SR. Social capital and mental illness: A systematic review. *Journal of Epidemiology and Community Health*. 2005; 59:619–627. [PubMed: 16020636]
- De Silva MJ, Harpham T, Tuan T, Bartolini R, Penny ME, Huttly SR. Psychometric and cognitive validation of a social capital measurement tool in Peru and Vietnam. *Social Science and Medicine*. 2006; 62(4):941–953. [PubMed: 16095787]
- De Silva MJ, Harpham T. Maternal social capital and child nutritional status in four developing countries. *Health and Place*. 2007; 13(2):341–355. [PubMed: 16621665]
- Diez-Roux AV. A glossary for multilevel analysis. *Journal of Epidemiology and Community Health*. 2002; 56(8):588–594. [PubMed: 12118049]
- Djamba YK. Financial capital and premarital sexual activity in Africa: The case of Zambia. *Population Research and Policy Review*. 1997; 16(3):243–57.
- Djamba YK. Social capital and premarital sexual activity in Africa: The case of Kinshasa, Democratic Republic of Congo. *Archives of Sexual Behaviour*. 2003; 32(4):327–37.
- Edgeworth R, Collins AE. Self-care as a response to diarrhoea in rural Bangladesh: Empowered choice or enforced adoption? *Social Science and Medicine*. 2006; 63(10):2686–2697. [PubMed: 16890335]
- Erulkar A, Ferede A. Social exclusion and early or unwanted sexual initiation among poor urban females in Ethiopia. *International Perspectives on Sexual and Reproductive Health*. 2009; 35(4): 186–193. [PubMed: 20123652]
- Fantahun M, Berhane Y, Wall S, Byass P, Högberg U. Women's involvement in household decision-making and strengthening social capital—crucial factors for child survival in Ethiopia. *Acta Paediatrica*. 2007; 96(4):582–589. [PubMed: 17306012]
- Frumence G, Killewo J, Kwesigabo G, Nyström L, Eriksson M, Emmelin M. 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*. 2010; 7(3):9–20. [PubMed: 21409300]
- Frumence G, Eriksson M, Nyström L, Killewo J, Emmelin M. 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*. 2011; 10(1):1–13.
- Harpham T, Grant E, Thomas E. Measuring social capital within health surveys: key issues. *Health Policy and Planning*. 2002; 17(1):106–111. [PubMed: 11861592]
- Harpham, T. The measurement of community social capital through surveys.. In: Kawachi, I.; Subramanian, SV.; Kim, D., editors. *Social Capital and Health*. Springer; New York, NY: 2008. p. 51-62.

- Islam MK, Merlo J, Kawachi I, Lindström M, Gerdtham U-G. Social capital and health: Does egalitarianism matter? A literature review. *International Journal for Equity in Health*. 2006; 5:3. [PubMed: 16597324]
- Kawachi, I. Social capital and health.. In: Bird, C.; Conrad, P.; Fremont, AM.; Timmermans, S., editors. *Handbook of Medical Sociology*. 6th Edition. Vanderbilt University Press; Nashville: 2010. p. 18-32.
- Kawachi, I.; Subramanian, SV.; Kim, D. Social capital and health: A decade of progress and beyond.. In: Kawachi, I.; Subramanian, SV.; Kim, D., editors. *Social Capital and Health*. Springer; New York, NY: 2008. p. 1-26.
- Kim, D.; Subramanian, SV.; Kawachi, I. Social capital and physical health: A systematic review of the literature.. In: Kawachi, I.; Subramanian, SV.; Kim, D., editors. *Social Capital and Health*. Springer; New York, NY: 2008. p. 139-190.
- Larsen J. The social vagina: Labia elongation and social capital among women in Rwanda. *Culture, Health and Sexuality*. 2010; 12(7):813–826.
- Moore S, Shiell A, Hawe P, Haines VA. The privileging of communitarian ideas: citation practices and the translation of social capital into public health. *American Journal of Public Health*. 2005; 95(8): 1330–1337. [PubMed: 16006421]
- Murayama H, Fujiwara Y, Kawachi I. Social capital and health: A review of prospective multilevel studies. *Journal of Epidemiology*. 2012; 22(3):179–187. [PubMed: 22447212]
- Nilsson J, Rana AK, Kabir ZN. Social capital and quality of life in old age: Results from a cross-sectional study in rural Bangladesh. *Journal of Aging and Health*. 2006; 18(3):419–434. [PubMed: 16648394]
- Paek HJ, Lee B, Salmon CT, Witte K. The contextual effects of gender norms, communication, and social capital on family planning behaviours in Uganda: A multilevel approach. *Health Education and Behaviour*. 2008; 35(4):461–477.
- Portes A. The two meanings of social capital. *Sociological Forum*. 2000; 15(1):1–12.
- Portes A. Social capital: Its origins and applications in modern sociology. *Annual Review of Sociology*. 1998; 24(1):1–24.
- Putnam RD. The prosperous community: Social capital and public life. *The American Prospect*. 1993; 38
- Sirven N. Endogenous social capital and self-rated health: Cross-sectional data from rural areas of Madagascar. *Social Science and Medicine*. 2006; 63(6):1489–1502. [PubMed: 16764979]
- Szreter S, Woolcock M. Health by association? Social capital, social theory and the political economy of public health. *International Journal of Epidemiology*. 2004; 33:650–667. [PubMed: 15282219]
- Thomas-Slayter BP, Fisher WF. Social capital and AIDS-resilient communities: Strengthening the AIDS response. *Global Public Health*. 2011; 6(Suppl. 3):323–343.
- United Nations. *World Statistics Pocketbook 2010: Least Developed Countries*. United Nations; New York: 2011.
- van Deth JW. Measuring social capital: Orthodoxies and continuing controversies. *International Journal of Social Research Methodology*. 2003; 6(1):79–92.
- Wakefield SE, Poland B. Family, friend or foe? Critical reflections on the relevance and role of social capital in health promotion and community development. *Social Science and Medicine*. 2005; 60:2819–2832. [PubMed: 15820589]
- Ware NC, Idoko J, Kaaya S, Biraro IA, Wyatt MA, Agbaji O, Chalamilla G, Bangsberg DR. Explaining adherence success in sub-Saharan Africa: An ethnographic study. *PLoS Medicine*. 2009; 6(1):e11. [PubMed: 19175285]
- Woolcock M. The place of social capital in understanding social and economic outcomes. *Isuma Canadian Journal of Policy Research*. 2001; 2:11–17.

Table 1
Quantitative Empirical Studies on Social Capital, Health, and Health Behaviours in the Least Developed Countries

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour 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) <i>Trust in others:</i> Previously had sex: OR = 1.0 High # of sexual partners: OR = 1.0 Did not always use condom: OR = 1.6 2) <i>Bridging trust:</i> Previously had sex: OR = 1.1 High # of sexual partners: OR = 1.8 Did not always use condom: OR = 1.0
Erulkar and 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) <i>Social exclusion:</i> Sexual initiation <15: OR = 1.10 Coerced sexual initiation: OR = 1.99 [*]
Paek et al., 2008	Uganda, 350 adults over age 18	Multilevel regression	Individual and collective attribute;	Individual level:	Individual level: Current use of a family planning method	Individual level:	1) <i>Social capital</i>

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour measures	Covariates	Estimates for social capital
			implicit application of cognitive function; implicit application of cognitive function; subcapital	cohesion, trust, informal social control, reciprocity, enforcement of norms, social participation) <i>Village level:</i> Aggregate of individual-level score; Construct validity: Strong		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 <i>Village level:</i> Gender norms, exposure to health-related radio programs, interpersonal communication	(individual-level): FP behaviour: $\beta = 0.05$ 2) <i>Social capital (village-level):</i> FP behaviour: $\beta = -0.42$
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) <i>No. of household members:</i> Premarital sex: $\beta = 0.08$
Djamba, 1997	Zambia, 1379 never-married teenagers 15-19 years of age	Multivariate logistic regression	Individual attribute; implicit application of 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	1) 3-6 <i>children:</i> Premarital sex: $\beta = -0.07$ 2) 7+ <i>children:</i>

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour measures	Covariates	Estimates for social capital
capital, human capital, human capital; $\beta = 0.18$							
Maternal and Child Health							
De Silva and 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)	<p><i>Child factors:</i> Sex, age, breastfeeding practice <i>Maternal factors:</i> Education level, age, marital status, religion, ethnicity, # of occupational activities, SES status <i>Household factors:</i> Poverty group, household composition <i>Contextual factors:</i> Place of residence</p> <p>1) <i>Member of community groups:</i> Height-for-age: $\beta = -.08$ Weight-for-age: $\beta = .12$ 2) <i>Talked and joined citizenship activities:</i> Height-for-age: $\beta = .21$ Weight-for-age: $\beta = .07$ 3) <i>Support from 2+ individuals:</i> Height-for-age: $\beta = .26$ Weight-for-age: $\beta = -.05$ 4) <i>Cognitive social capital:</i> Height-for-age: $\beta = .27$ Weight-for-age: $\beta = .24$</p>	1) <i>Social capital score:</i> Under-5 child mortality: OR = 1.9
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 <i>Kebele</i> leadership, membership of community organisations, trusting people,	Child mortality	Household economic status, household decision-making, maternal age, literacy, number of pregnancies, absence of windows in	

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour measures	Covariates	Estimates for social capital
Story							
thinking that people can hurt); Construct validity: Intermediate, thinking that people can hurt); Construct validity: Intermediate, thinking that people can hurt); Construct validity: Intermediate, thinking that people can hurt); Construct validity: Intermediate							
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 neighbours, spends time with friends), community level (2-item score: community organisation membership, voted in last election); Construct validity: Weak	Self-rated quality of life	Age, marital status, household economic status, education	1) <i>Individual-level social capital:</i> Quality of life: OR = 1.7* 2) <i>Community-level social capital:</i> Quality of life: OR = 1.9*

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour measures	Covariates	Estimates for social capital	Story
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	<i>1) Associations:</i> Self-rated health: ME = .167 <i>2) Collective action:</i> Self-rated health: ME = .420 [*] <i>3) Ceremony:</i> Self-rated health: ME = .426 <i>4) Network:</i> Self-rated health: ME = .416 [*]	

^{*} p < 0.05

Table 2

Qualitative Empirical Studies on Social Capital, Health, and Health Behaviours in the Least Developed Countries

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour 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 (formalised membership rules, strict conduct fostered, religious norms and values); Construct validity: Strong	Sexual behaviour 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 behaviour, specifically the number of sexual partners, instances of casual sex, abstinence until marriage among youth, and demands for condom use' (p. 8).
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 behaviour' (p. 19).
Ware et al., 2009	Nigeria, Tanzania, Uganda; 158 AIDS patients, 45 treatment	Ethnographic methods using category construction	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

Author(s) and year	Country and sample size	Analytic strategy	Conceptual framework	Social capital measures and construct validity	Health/health behaviour measures	Description of social capital findings
	partners, 49 healthcare providers partners, 49 healthcare providers	from individual interviews				capital in relationships as a resource for prioritizing adherence and overcoming economic obstacles to care' (p. 0046).
Edgeworth and 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 diarrhoeal 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 recognise, diagnose and undertake appropriate forms of treatment in response to diarrhoea' (p. 2693).