

20 September 2012

Village and Region as Contexts for Health and Demographic Outcomes

Reeve Vanneman
reeve@umd.edu

Manjistha Banerji
banerji.manjistha@gmail.com

Esha Chatterjee
eshachat@gmail.com

Kriti Vikram
kritivikram@gmail.com

University of Maryland

Abstract

“Context” has almost always been defined by local communities: urban neighborhoods and rural villages. While important, this design ignores the larger regions into which local communities are organized. We propose an analysis of health and demographic outcomes from the Indian Human Development Survey 2005 that simultaneously analyzes both village- and district-level contexts. Comparable village and district data from the Indian Census measure five education and labor force characteristics frequently related to health and demographic outcomes. We propose to study a broad array of outcomes to capture the expected variety of community and regional relationships.

Village and Region as Contexts for Health and Demographic Outcomes

The explosion of multilevel research has a long and well-respected pedigree in demography (Entwisle 2007). In high income countries the contexts have more often been urban neighborhoods while studies of low- and middle-income countries have more often taken rural villages as the relevant context (but see Montgomery and Hewett 2005).

Relatively less well studied in either literature is the importance of regional contexts beyond the local community but below the national level. In high-income countries, differences among urban neighborhoods have not been studied jointly with differences among urban areas themselves. Indeed, there has been more attention paid to the (also important) question of how to define neighborhood boundaries (Sampson, Morenoff, and Gannon-Rowley 2002) than to issues of how neighborhoods themselves are nested within larger regional contexts. While some attention has been paid to spillover effects into bordering neighborhoods and to the spatial organization of neighborhoods, it is neighborhoods and not cities or regions that have been the contextual units of analyses.

Cross-national studies will sometimes incorporate contextual data at the community level, in effect studying contexts at the two extremes of size. DHS data have sometimes been combined to study the differential effects of local contexts across nations, but the intermediate regional levels, also identified in most DHS data, have been as neglected as in high-income countries.

There are important theoretical and empirical reasons to question this relative neglect of regional variations. The proposed paper would help remedy the neglect by integrating a rich source of household data from India, the India Human Development

Survey (Desai et al., 2010), with identical census data from both the village and district levels. Together these data provide a unique opportunity to compare the relative importance of the two nested contexts across a wide variety of health and demographic outcomes. Comparisons across a variety of outcomes should help us understand how the relative importance of village and region vary with the type of demographic and health behaviors being studied.

Regions as a relevant demographic and health context

All of the theoretical reasons for considering villages and neighborhoods as important contexts (networks, flows of information and norms, institutions) also argue for a separate role for regional areas. In addition, the importance of *markets* – labor markets, marriage markets, and commodity and service supply markets – becomes more obvious at the regional level than has been the case for the local community. The earlier romantic notion of local communities as village republics only weakly linked to broader contexts was, if ever very accurate, certainly not persuasive in the contemporary context. Analyses that assume the independence of village contexts are both statistically and demographically questionable. If contextual analyses derive their importance from the recognition that a community is more than the simple aggregate of the individuals living in it, then it is equally important to realize also that regions are more than the simple aggregates of the communities that are located there.

Networks. Social interaction among rural households is, of course, predominantly constrained by the local village community. But these interactions are not completely limited to the village community. Family, caste, economic, and political relationships tie

each household to a wider network of persons outside the village. Marriage exogamy throughout much of India ensures that each household is tied to families in villages that send daughters. These are often overlapping ties; over 20% of rural, 15-49 year old women in IHDS 2005 have another natal family member married into their current village. When households have personal ties to medical, educational, and government institutions, these ties are as likely to people outside the village as in the village. Altogether 36% of rural households report an acquaintance in one of these middle-class institutions outside their own village. To be sure, these ties outside the village are likely to be less frequent and less intimate than ties within the village but precisely because these are weak ties, they may be especially consequential as household social capital (Granovetter 1973).

Flows of information and norms. New ideas about everything from immunization to children's schooling do not originate within villages. They are imported through various channels, many of which have a regional base. Many ideas diffuse by sequential geographic steps, moving from one region to the next from center to periphery; and within peripheral areas from towns to well connected villages to more outlying areas. Such a diffusion process reinforces the coherence of regional sub-cultures. New ideas within households are influenced not only by their village contexts but by changes in the areas surrounding their village. Thus we should expect characteristics of both the village and the region to be related to household behaviors and outcomes.

Institutions. Even more clearly than for networks and cultural diffusion, local institutions have strong bases in regional contexts outside the village. Schools, medical facilities, government administration, and most other village institutions are organized hierarchically into regional, state, and national structures. How these structures are

grounded in local communities is important, of course, but to consider only the local institutional base is to ignore the formal organizations that tie the local institutions together. If community contexts are important in part because institutional development varies across communities, then we should not ignore the regional variance either.

Markets. A regional perspective is especially important for activities organized into market exchanges since markets almost by definition extend well beyond local boundaries. Even poor agricultural laborers will seek employment in neighboring villages; farmers will sell their produce into regional markets; and regional industrial growth can bring enormous change within nearby villages. Local prices for labor and commodities, therefore, are not set within village boundaries but are organized regionally. Especially for outcomes dependent on market forces, contexts based on local communities are an inadequate scope for understanding health and demographic outcomes. For example, among rural women, 15-49, over half (55%) went outside their village for treatment for even a minor illness such as a fever, cough, or diarrhea.

India as an appropriate setting for investigating the joint influence of village and district

Indian social structure (and not coincidentally Indian statistics) are organized along well-defined local, district, and state dimensions. District administration has been well established since at least Mughal times, was reinforced during colonialism, and has been the basic building block of contemporary Indian social and political life. Districts are the primary location of all government administration.

There is a well-established literature based on district-level data (cites), much of which originated before Indian micro-data became available. More recently, the district

provides an opportune level of aggregation for multilevel analyses (e.g., Parashar 2005, Desai and Yu 2010, ...). Villages have also been used as the relevant context (e.g. Kravdal 2004) in studies of health outcomes. But, as yet, no study has combined both village and district data within a single design.

The Indian Primary Census Abstract (PCA) provides a good range of data available at both the village and district levels. These data include literacy, broad employment, and basic caste measures. These Census PCA data offer three advantages for multilevel analyses: a) they provide equivalent measures for both contextual levels, b) they derive from a census that minimizes sampling error, and c) they are independent of the micro-data used at the household level and so avoid some problems of correlated errors. For this paper, we focus on five measures prominent in the demographic and health literature:

- Female literacy
- Male literacy
- % of non-agricultural employment
- female share of the labor force
- % landless of agricultural employment

Maternal education has long been known to be one of the most critical determinants of child health (cites), but it is not only the education of the child's own mother that matters but how well educated the women in the local community are (Kravdal 2004, ...). Male literacy provides an important contrast to test whether the educational environment is gendered and how that makes a difference for health outcomes. The proportion of the rural labor force outside agriculture is a common measure of economic development. The

female share of the labor force varies widely across India and has been shown to be an important determinant of gendered outcomes such as gender differentials in child mortality (e.g., Kishor 1993). Finally, landlessness in agriculture is correlated with poverty and inequality.

We use data from the 2001 census, approximately four years prior to the IHDS sample. District positions on these measures are quite stable across censuses so the amount of lag makes little difference for the analysis. We limit the analysis to rural areas to take advantage of the PCA village data.

Health and demographic behaviors and outcomes

The literature has reported a wide range of household-level behaviors and outcomes that are correlated with village-level characteristics, even after controlling for household level characteristics. Fortunately, the IHDS is a rich data source that can provide measures of almost all of these. The analysis compares district- and village-level effects across a range of these outcomes because we expect quite different results for different behaviors. Desai and Wu (2010) for instance, argue persuasively that while pre- and post-natal care may be primarily a function of a woman's own individual characteristics, delivery care is more subject to the general normative climate about the treatment of women. With regard to differences between community and regional influences, we expect outcomes that depend more on institutional or market mechanisms should show relatively stronger district-level effects (i.e., relative to village effects) since institutions and markets are organized more along regional lines. Outcomes that depend on networks and the flow of information [and norms ?] are more likely to have relatively stronger village-level effects. In addition, more routine events may be more conditioned by the daily social constraints

found at the local level; but more difficult and more threatening challenges may stimulate households to engage their regional contexts in search of new solutions.

The paper focuses on health outcomes in line with the theme of the panel, but also includes other demographic outcomes to investigate whether health has any distinctive contextual patterns. Not all outcomes listed below would be included in an eventual presentation, but we will attempt to select those which represent different contextual patterns. Some outcomes should be more sensitive to the local community (e.g., short term morbidity) and some to regional contexts (e.g., delivery care):

- Child health:
 - Morbidity
 - Immunization
 - Stunting
 - Mortality (0-5)
- Medical utilization
 - Location of medical care for short-term morbidity
 - Antenatal care
 - Trained medical attendance at delivery
- Fertility
 - Contraceptive use
 - Ideal family size
- Education
 - Current enrollment for ages 15-18
 - Test scores for ages 8-11

Household level controls

IHDS includes household level data corresponding to each of the contextual variables described above: respondents' and spouses' (and/or mothers' and fathers') educational attainment, respondents' and spouses' employment status, household employment (cultivator, agriculture labor, non-agriculture), household annual income and wealth. Additional controls will vary somewhat with each dependent variable but generally include age, gender, caste, and religion.

DISCUSSION

If successful, this research offers the possibility of significantly expanding the scope of contextual studies, for high-income countries as well. Nobody believes that social networks, normative influences, information flows, institutions, or markets end at the boundaries of local communities. Interpersonal ties within the local community may be more intense and more frequent, but precisely because they are weaker ties, regional contexts may be more consequential in introducing change or dealing with life's most difficult challenges. Thus we should not expect a single answer to the relative strengths of local and regional contexts. Their roles will vary by the type of behaviors being analyzed and by the strength of the household's ties to the regional context. By confining research to local communities, we have neglected an important dimension of contextual influence. Understanding where contextual influences are coming from can help us understand better the processes that are generating them.

References

- Babalola, Stella. 2009. "Determinants of the Uptake of the Full Dose of Diphtheria-Pertussis-Tetanus Vaccines (DPT3) in Northern Nigeria: A Multilevel Analysis." *Maternal and Child Health Journal* 13(4): 550-558.
- Boyle, Michael H., Yvonne Racine, Katholiki Georgiades, Dana Snelling, Sungjin Hong, Walter Omariba, Patricia Hurley, Purnima Rao - Melacini,. 2006. "The influence of economic development level, household wealth and maternal education on child health in the developing world" *Social Science and Medicine* 63(8): 2242-2254.
- Desai, Sonalde and Lester Andrist. 2010. "Gender Scripts and Age at Marriage in India." *Demography* 47(3): 667-687.
- Desai, Sonalde and Soumya Alva. 1998. "Maternal Education and Child Health: Is there a Strong Causal Relationship?" *Demography* 35(1): 71-81.
- Desai, Sonalde, Amaresh Dubey, Brij Lal Joshi, Mitali Sen, Abusaleh Shariff, and Reeve Vanneman. 2010. *Human Development in India: Challenges for a Society in Transition*. New Delhi: Oxford University Press.
- Desai, Sonalde and Lijuan Wu. 2010. "Structured Inequalities: Spatial Disparities in maternity Care in India." *Margin: A Journal of Applied Economics* 4(3): 293 - 320.
- Dommaraju, Premchand, Victor Agadjanian, and Scott Yabiku. 2008. "The Pervasive and Persistent Influence of Caste on Child Mortality in India." *Population Research and Policy Review* 27(4): 477-495.
- Entwisle, Barbara. 2007. "Putting People into Place." *Demography* 44(4): 687-703.
- Entwisle, Barbara, Katherine Faust, Ronald R. Rindfuss, and Toshiko Kaneda. 2007. "Networks and Contexts: Variation in the Structure of Social Ties." *American Journal of Sociology* 112(5): 1495-533.
- Entwisle, Barbara, William Mason, and Albert Hermalin. 1986. "The multilevel dependence of contraceptive use on socioeconomic development and family planning program strength." *Demography* 23(2): 199-216.
- Fotso, Jean-Christophe and Barthelemy Kuate-Defo. 2006. "Household and community socioeconomic influences on early childhood malnutrition in Africa." *Journal of Biosocial Science* 38(03): 289 - -13.
- Gage, Anastasia J. 2007. "Barriers to the utilization of maternal health care in rural Mali." *Social Science & Medicine* 65(8): 1666-1682.
- Gage, Anastasia J. and Marie Guirlande Calixte. 2006. "Effects of the physical accessibility of maternal health services on their use in rural Haiti." *Population Studies* 60(3):
- Griffiths, Paula, Zoe Matthews, and Andrew Hinde. 2002. "Gender, family, and the nutritional status of children in three culturally contrasting states of India." *Social Science and Medicine* 55(5): 775-790.

- Griffiths, Paula, Nyovani Madise, Alison Whitworth, and Zoe Matthews. 2004. "A tale of two continents: a multilevel comparison of the determinants of child nutritional status from selected African and Indian regions." *Health & Place* 10(2): 183-199.
- Holmes, Jessica. 2006. "Do community factors have a differential impact on the health outcomes of boys and girls? Evidence from rural Pakistan." *Health Policy and Planning* 21(3): 231-240.
- Kiros, Gebre - Egzbiabher Kiros and Michael J. White. 2004. "Migration, community context, and child immunization in Ethiopia." *Social Science & Medicine* 59(12): 2603-2616.
- Kishor, Sunita. 1993. "May God Give Sons to All: Gender and Child Mortality in India." *American Sociological Review* 58: 247 - 265.
- Kravdal, Oystein. 2004. "Child mortality in India: The community-level effect of education." *Population Studies* 58(2): 177-192.
- Ladusingh, Laishram and Chungkham Holendro Singh. 2006. "Place, community education, gender and child mortality in North-east India." *Population, Space and Place* 12(1): 65-76.
- Lahiri, Subrata, Avishek Hazra, and Abhishek Singh. 2011. "Sex - Differentials in Childhood Mortality in Punjab and Haryana: Are They Reality?" *Journal of Population Studies* 43: 71-98.
- Luke, Nancy and Hongwei Xu. 2011. "Exploring the meaning of context for health: Community influences on child health in South India" *Demographic Research* 24(15): 345-374.
- Madise, Nyovani J., Zoe Matthews and Barrie Margetts. 1999. "Heterogeneity of child nutritional status between households: A comparison of six sub-Saharan African countries" *Population Studies: A Journal of Demography* 53(3): 331-343.
- Madise, Nyovani J., Zoe Matthews, and Barrie Margetts. 1999. "Heterogeneity of Child Nutritional Status between Households: A Comparison of Six Sub-Saharan African Countries." *Population Studies* 53(3): 331-343.
- Magadi M, Diamond I, Rodrigues RN. 2000. "The determinants of delivery care in Kenya" *Social Biology* 47(3-4): 164-188.
- Magadi MA, Madise NJ, Rodrigues RN. 2000. "Frequency and timing of antenatal care in Kenya: explaining the variations between women of different communities" *Social Science and Medicine* 51(4): 551-561.
- McNay, Kirsty and Perianayagam Arokiasamy, and Robert Cassen. 2003. "Why are uneducated women in India using contraception? A multilevel analysis." *Population Studies* 57(1): 21-40.
- Mistry, Ritesh, Osman Galal, and Michael Lub. 2009. "Women's autonomy and pregnancy care in rural India: A contextual analysis." *Social Science & Medicine* 69(6): 926-933.

- Moestue,H. and S. Huttly. 2008. "Adult education and child nutrition: the role of family and community" *Journal of Epidemiology and Community Health* 62: 153 - 159.
- Montgomery, Mark R. and Paul C. Hewett. 2005. "Urban Poverty and Health in Developing Countries: Household and Neighborhood Effects." *Demography* 4(3): 397-425.
- Parashar, Sangeeta. 2005. "Moving beyond the mother - child dyad: Women's education, child immunization, and the importance of context in rural India." *Social Science & Medicine* 61(5): 989-1000.
- Price, James I. and Alok K Bohara. forthcoming. "Maternal health care amid political unrest: the effect of armed conflict on antenatal care utilization in Nepal." *Health Policy and Planning*.
- Sacks, Audrey and Margaret Levi. 2010. "Measuring Government Effectiveness and Its Consequences for Social Welfare in Sub - Saharan African Countries." *Social Forces* 88(5): 2325 - 2351.
- Sagna, Marguerite and T.S. Sunil. 2012. "Effects of individual and neighborhood factors on maternal care in Cambodia." *Health and Place* 18(2): 415-423.
- Sampson, Robert J., Jeffrey D. Morenoff, and Thomas Gannon-Rowley. 2002. "Assessing "Neighborhood Effects": Social Processes and New Directions for Research." *Annual Review of Sociology* 28: 443 - 478.
- Sastry, Narayan. 1996. "Community characteristics, individual and household attributes, and child survival in Brazil." *Demography* 33(2): 211 - 29.
- Sepehri, Ardeshir, Sisira Sarma, Wayne Simpson, and Saeed Moshiri. 2008. "How important are individual, household and commune characteristics in explaining utilization of maternal health services in Vietnam?" *Social Science & Medicine* 67(6): 1009-1017.
- Stephenson, Rob, Angela Baschieri, Steve Clements, Monique Hennink, and Nyovani Madise. 2006. "Contextual Influences on the Use of Health Facilities for Childbirth in Africa." *American Journal of Public Health* 96(1): 84 - 93.
- Stephenson, Rob and Amy Ong Tsui. 2003. "Contextual Influences on Reproductive Wellness in Northern India." *American Journal of Public Health* 93(11): 1820-1829.
- Wen, M., C.R. Browning, and K.A. Cagney. 2003. "Poverty, Affluence, and Income Inequality: Neighborhood Economic Structure and Its Implications for Health." *Social Science and Medicine* 57: 843-60.