Individual social network factors across disparate relationships, social norms and their association with adolescent pregnancy in rural Honduras.

Abstract

We used data from 176 villages in rural Honduras, including measures on demographics, reproductive health, social norms and social networks to look at the social network and social normative factors associated with having had an adolescent pregnancy. At what levels of social interaction are norms regarding adolescent pregnancy the most salient, and for what kind of norm? Initial results suggest that the association between a girls adolescent pregnancy and that of a social contact varies by relationship, with the strongest associations being between female siblings and same household members. When a girl's social contact believed that younger age of pregnancy is optimal, she was more likely to have had an adolescent pregnancy, particularly if the alter was her mother, provider, or lived in the same household. We also found that girls who have had adolescent pregnancies were less embedded in strong cohesive networks, but at the crossroads of disparate networks.

Research Question:

We used data from 176 villages in rural Honduras, including comprehensive measures on demographics, reproductive health, social norms and social networks to look at the social network and social normative factors associated with having had an adolescent pregnancy. We ask at what levels of social interaction are norms regarding adolescent pregnancy the most salient, and at what level of norm? Are girls who have had adolescent pregnancies more likely to be socially connected with others who have? Is there evidence of more overt social influence which may hinder or encourage girls to become pregnant, and if so where are those pockets of influence the most powerful?

Data and Methods:

Study Population

Our study uses full population census data from the western municipalities of the largely rural Copán department of Honduras to analyze the determinants of adolescent fertility at the social network level. Data were collected as part of a randomized controlled trial of social network targeting of a maternal and neonatal health intervention in this area (1, 2). A full description of the study design and data collection methods are published elsewhere (1). The area was chosen because of the geographic diversity of its villages, population vulnerability to maternal and neonatal health complications, and suitability for data collection. This part of Honduras also has a traditionally high rate of adolescent fertility (3), making it an ideal location for understanding the distribution of adolescent fertility.

We conducted a census in 2016 with 92% of the eligible population, of which 25,032 completed a baseline survey that included sociocentric and behavioral health measures. For the purposes of the fertility analyses we excluded children under 15 (N=2,577) as they did not complete the full reproductive history, and the proportion who had already

experienced a pregnancy was miniscule. Individuals who were cognitively impaired and unable to provide consent were also excluded (30).

Measures

Our unit of analysis was restricted to individual women and girls between the ages of 15 and 20 at the time of the survey, for whom an adolescent birth would have been within the last few years (N=2,990). The outcome, adolescent birth, was defined as having had a child under the age of 18, consistent with the UNICEF definition of early marriage/and or partnership, the primary risk factor for pregnancy at a young age. The social network partners however, were nominated from within the entire population of respondents within each village (n=22,390), so their ages and genders vary accordingly.

Outcome Variable: Adolescent childbirth

Female respondents were asked whether or not they had ever given birth to a living child. Men were asked whether or not a woman had ever given birth to a living child that was theirs. Women who reported having given birth were then asked how old they were at the time of their first pregnancy. Men who reported having fathered a child were asked how old they were at the time of their first child's birth. As part of a comprehensive birth history, respondents were asked to provide detailed information on their youngest child, including the exact date of birth.

Individual demographics

Individual demographic controls included age, marital status, religion, income sufficiency, education, food security, proportion of life lived in the village, and indigenous status.

Attitudes and social norms at the individual level

All respondents were asked their personal attitude regarding the appropriate age of first pregnancy for women, "At what age is it OK for a girl to have her first baby?" We also asked each respondent regarding their perception of community injunctive norms around adolescent

birth “If a girl younger than 18 has a baby, will people in the community think this is good, bad, or neither?” We modeled normative beliefs in support of adolescent birth as a binary variable “Good” or “Bad/Neither”.

Social network factors

Because the unit of analysis is females under the age of 21, all individual-level variables are specific to that population. However, the social network measures were calculated from among the *entire sample of men and women of all ages for each village* in order to get a comprehensive understanding of the village-level social environment. Associations between individual girls and their social network nominations could include anyone within the village that girls may have nominated.

Village and individual social network level normative factors

For each individual in the village we had individual attitudes regarding the appropriate age for first pregnancy, and the reported perceptions of norms regarding pregnancy under the age of 18 as “Good” (collective norms). As a proxy for descriptive norms, which would ideally be measured by asking each respondent what they think is normally practiced, we also had a measure of whether any individual connected to a girl under the age of 21 had given birth as an adolescent. We aggregated the normative measures at the village level to add a further level of social interaction to the question of possible normative influence.

Individual network factors

As part of the network survey, respondents were asked 12 separate questions regarding their social connections within the community, including familial relationships, close personal relationships, economic support, and health advice. For each girl, using the entire village level network we calculated standard measures of network centrality: degree centrality, or how many nominations a girl had; closeness centrality or the average distance of each person from each other person in the network; betweenness centrality, or whether any given individual functions as a bridge between more closely connected parts of the networks, and eigenvector

centrality, which is a popularity measure calculated as a function of the popularity of those to whom an individual is connected.

Analyses:

We matched each individual girl with each of her nominated alters, creating dyadic observations with one observation per respondent-alter pair. Observations included pertinent attitudinal and behavioral measures for the respondent as well as those for the corresponding alter. We also included separate measures of each name generating question in which the respondent nominated the alter. For instance a person could be named as a closest friend, and as someone with whom the respondent spends their free time. Relationship nominations were noted in separate columns in the dataset, with 1 indicating that the respondent nominated that alter in that question, and a 0 indicating that they did not. The outcome for our analyses was a binary measure of adolescent pregnancy, with multiple observations per respondent adjusted for using a general estimating equation.

To assess the salience of specific relationships we interacted relationship type with predictors of interest. For instance, to understand which type of relationship was more salient for the descriptive norm of adolescent pregnancy, we interacted whether or not the alter had an adolescent pregnancy with the type of relationship, i.e. mother, sibling, friend etc.

We included an additional set of analyses to look at the girls place within the larger village network, and the association of those network factors with the adolescent pregnancy outcome. Because each separate name generating question elicited its own network, we were able to consider those network factors by network type. For instance is centrality significant over the entire combined network, or only within strong affective relationships?

Initial Results:

Our initial results suggest that there are important relationships that are strongly associated with the likelihood of a girl's adolescent pregnancy. When a girl's alter believed that younger age of pregnancy is optimal, she was more likely to have had one, particularly if the alter was her mother ($\beta = 0.41$ $p<0.01$), provider ($\beta = 0.33$ $p=0.01$), someone with whom the girl

discussed private matters (β = 0.30 p<0.001), or lived in the same household (β = 0.49 p<0.001). Alter's reported norms around community support for adolescent pregnancy were significant until we included aggregated village norms, after which it was not. Adolescent pregnancy was most strongly correlated with adolescent pregnancy of alters who were close in age to themselves, female siblings (β = 0.65 p<0.001) and lived in the same household (β = 0.49 p<0.001), while only marginally associated with the adolescent pregnancy of their mothers. We will investigate these relationships in more detail, including delving more deeply into same household relationships, partnership, and the composition of affective relationships.

We also found that girls who have had adolescent pregnancies were less embedded in strong cohesive networks, but at the crossroads of disparate networks. Our final results will include a detailed look at the different network measures across the distinct networks elicited through the variety of questions that we asked.

Interpretation:

Adolescent pregnancy in the rural Honduras context is strongly associated with family context: attitudes of caregivers, and actual pregnancy outcomes of those proximal and close in age to the adolescent girls. Collective norms at the village level are also strongly associated with adolescent pregnancy, suggesting a complex dynamic in which both family and community context matter.

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3. USAID. Statcompiler http://beta.statcompiler.com/; 2016. (Accessed June 21 2016).