The occurrence of fertility transitions in much of the developing world has been a striking and much-documented trend, even more so because sudden declines in fertility were often not accompanied by corresponding improvements in expected earnings or strengthening of public pensions. The government and NGO programs meant to facilitate fertility declines have often been predicated on the assumption that one's taste for children can be changed without consideration for the underlying incentives for childbearing. In other words, these programs seek to change existing "social norms". The influence of advertising or peer effects on fertility is still an open question. If individual fertility decisions are influenced by one's social network, then fertility rates may follow a dynamic process whereby an initial shock to network fertility alters the taste for children in other members of the social network amplifying the initial shock. Such a process might explain the sudden drop in fertility in select developing countries. On the other hand, should fertility be unresponsive to peer effects, existing interventions such as "social marketing" may be a poor use of scarce resources. We exploit a detailed micro sample from rural South Africa to study whether women's fertility is responsive to the observed fertility of their immediate neighbors. This analysis is feasible because of the precise mapping of individual homesteads for the entire survey area. We show that the total fertility rate in the study area, which is currently about 2.5, is the aggregate of a wide range of community-specific fertility rates. Preliminary findings also suggest that a woman's own likelihood of pregnancy is positively though modestly related to lagged community fertility, suggesting a role for social networks in fertility choice.

The importance of ideational change and other influences resulting from social interaction to fertility behavior has long been hypothesized (for example, Cleland and Wilson 1987; Bongaarts and Watkins 1996; Montgomery and Casterline 1996). Several studies have attempted to model the process of diffusion of ideas and information through social networks (Jackson 1972; Holden 1987; Rosero-Bixby and Casterline 1993; Kohler 1997; Cubitt and Sugden 1998). Others have presented empirical tests of the influence of social networks on fertility behavior, either by asking respondents about their social networks (Behrman, Kohler and Watkins 2002) or by imposing macro-level neighborhood information as explanatory variables to individual behavior (Brewster 1994; Barber et al 2002). The emerging evidence is that social networks affect fertility behavior, especially through social learning rather than influence (Behrman, Kohler and Watkins 2002). Kohler (1997) demonstrates that social learning may be an ineffective way of conveying information about contraception and that it may entail path-dependent outcomes. Barber et al (2002), among others, show that fertility influences can operate through indirect contact and weak ties. They find that not only those couples participating in voluntary associations, but also other couples living in the proximity of such associations change their behavior.

As discussed above, past empirical studies have relied on self-reported social networks or macro-level neighborhood information to identify social learning and influence. Self-reports are useful to understanding the nature of social networks, but may suffer considerable reporting bias given the inherently complex and personal nature of decisions surrounding childbearing. Instead, we look for evidence of peer effects on fertility

directly by measuring the physical location of women and the geographic distance between them. This method does not identify close friendships, but it captures the weak social ties of daily life that may be most important to norms and social learning (Granovetter 1973; Kohler 1997). We rely on the inherent lag between fertility choice and outcome to test whether revealed fertility changes in a woman's social network influence her own fertility.

DATA AND METHODS

We use data from a demographic surveillance site in rural South Africa. The study population comprises part of the Hlabisa district of KwaZulu-Natal, a rural area with about 86,500 individuals who are members of over 11,000 households. The data come from the Africa Centre Demographic Information System of the Africa Centre for Health and Population Studies, and include information on all individuals in the study area, including vital events, migration, reproductive behaviour, socio-economic resources, and geographic location. This paper takes advantage of the reproductive histories collected from women aged 15 to 45, as well as detailed household information on resources, employment and education of household members, as well as location of the household within the study area.

We use two types of geographic information. First, we identify in which community each woman lives. The study area is divided into 25 izigodi, which are traditionally-defined Zulu communities. Using retrospective and prospectively collected data on women living in the study area in 2000, we construct a panel of age-specific fertility rates

for each isigodi between 1995 and 2002. We then use lagged community fertility as an explanatory variable on a woman's own fertility, together with other explanatory variables and fixed effects. If the fertility rates in a woman's isigodi a year before have some explanatory power in women's fertility behavior, it is evidence for social influence. Econometrically, we utilize a semi-parametric hazard model to examine the role of time-varying covariates on the instantaneous hazard of a non-fertility spell ending.

Secondly, we use GIS information to proxy for social connectedness. We expect that the fertility experiences of women living closer to each other have a greater influence than women living further away. Therefore, we use lagged information on fertility within geographic boundaries of various sizes as explanatory variables for women's own fertility.

PRELIMINARY RESULTS

The total fertility rate in the study area, which is currently about 2.5, is the aggregate of a wide range of community (izigodi) fertility rates. It has been shown in other studies that there is heterogeneity between women, with a small number of women having a large number of children. It appears, however, that at least part of the heterogeneity can be explained not by individual differences but by differences between regional subgroups. The period total fertility rates of the communities that make up the study population cover a wide range of as much as 3 children per women. Furthermore, we find that a woman's own likelihood of pregnancy is positively though modestly related to lagged community fertility, suggesting that social networks play a role in fertility choice.

Specifically, a one unit increase in lagged total fertility rate in the community increases the relative risk of childbearing in the period by 2-8%.

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