Social Networks and Women's Reproductive Outcomes:
Evidence from a Randomized Experiment in Rural India
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A. Summary:

In this study, we investigate the causal impact of a social network-based family planning intervention on young women's contraceptive use, reproductive health, and fertility by means of a randomized experiment. We will implement this intervention for married women aged 18 to 30 who have at least have one child in Jaunpur, Uttar Pradesh, India, where access to high-quality family planning is poor, and stigma around contraceptive use is high. Each woman in our eligible population will be randomly assigned to one of three groups: a **no-voucher** group, a **solo-voucher** group, or a "**bring-a-friend**" (BAF) group. All participants will receive an information brochure that describes the benefits of family planning, healthy birth spacing, and timing of pregnancy. Women who are randomly assigned to the **solo-voucher** and **BAF** groups will also receive a voucher for discounted access to family planning services at a high-quality private clinic. In addition, women who are randomly assigned to the **BAF group** will be encouraged to bring a friend who may also be, in consultation with a doctor at the FP clinic, eligible to receive the same voucher for family planning as the treated woman. Through this study, we aim to evaluate whether enabling a woman to recruit a friend to accompany her to the clinic, who can possibly help her overcome the stigma of going to the FP clinic, leads to a greater shift in family planning practices and attitudes than targeting both of those women individually.

B. Background / Motivation:

Despite declining birth rates and improvements in maternal health care in developing countries, the total fertility rate and the number of unintended pregnancies remain high, particularly for young women. A large number of unintended births and unwanted pregnancies are a cause of social concern because they contribute to high rates of induced abortion, maternal morbidity and mortality, and poor child health outcomes, which in turn place substantial health and economic burdens on women, their children, and their families. Consequently, improving access to family planning among young women, which helps them to meet their desired fertility goals and to avert unplanned pregnancies, remains a policy priority. Indeed, one of the targets of the Fifth Sustainable Development Goals is to empower all women and girls through universal access to sexual and reproductive health.

To date, however, many young women face social and structural barriers, which limit their access to and initiation of high-quality family planning and reproductive health services. While prior research has recognized the potential linkages between social networks and women's fertility decisions, there is still a need for a more rigorous understanding of the effects of social networks on the initiation and continuation of family planning and on fertility behavior, particularly in developing countries where data on social networks is scarce and where social networks may play a key role in shaping women's reproductive health outcomes. Most existing studies on family planning that have gathered social network data in low- and middle-income settings have been cross-sectional in nature with limited scope for inferring changes in networks and outcomes over time. More generally, few randomized trials have been conducted to assess the causal impact of family planning interventions in low-income countries, at the individual level, and with an emphasis on young women.

India provides a unique setting for investigating the role of social and familial networks on family planning and fertility behavior. The patrilocality customs that require a married woman to move into her husband's household combined with the higher prevalence of joint and extended families, especially in rural India, imply that a young woman's fertility decisions are likely to be significantly influenced by her mother-in-law and other women in the household, in addition to her pre-marital social network. In Uttar Pradesh, there is great social pressure for those who have just gotten married to have a child; according to the 2005-06 National Family Health Survey, 58 percent of women aged 18-30 in rural Uttar Pradesh had a child within the first two years of their marriage and 29 percent had a child within the first year of marriage. In addition, birth intervals in Uttar Pradesh are short, with more than 60 percent of women reporting that their most recent birth was within three years of their previous birth (NFHS 2005-06). Given the maternal and child health

risks that are associated with short birth intervals, a primary focus of our intervention will be to promote healthy birth spacing.

C. Identification Strategy and Outcomes:

We will collect data on the following outcomes as our dependent variables: 1) clinic visits; 2) voucher use; 3) attitudes toward family planning; 4) contraceptive use, including method mix and adherence to methods (compliance, discontinuation, switching); and 5) pregnancy status and fertility intentions, including Knowledge, Attitudes, and Practices (KAP).

We are primarily interested in testing if enabling a woman to bring a friend (by offering an incentive to the friend) makes that woman more likely to take up treatment. We suspect that women will find it easier to break a social taboo or overcome their fears of medical side effects if a friend joins them. Though women were already free to do this, the bring-a-friend voucher, by covering the friend, removes barriers for a woman who has trouble finding or persuading a friend to join her. To estimate this effect, we will compare the change in outcomes for women assigned to the **BAF voucher group** to women in the **solo-voucher grou**p. Women in these two groups receive the same voucher and are similar in all respects except that BAF women can also incentivize a friend to accompany her. We will test, among other things, whether BAF women are more likely to visit the clinic; more likely to bring a friend; and more likely to take up family planning than solo-voucher women. Since a BAF woman can bring multiple women over multiple visits, we can also compare the number of friends brought along by BAF group members vs solo group members.

Conceptually, we think the differences between the BAF and solo voucher groups might be explained by at least three mechanisms:

- *"Altruism":* We will not observe an effect on the ego's outcomes, but we do observe an effect on her friend in the BAF intervention compared to the solo-intervention.
- *"Taboo of going alone":* We should see an effect on the BAF arm for both ego and friend compared to the solo-intervention.
- "*Risk- Sharing":* It is possible that young women are more willing to try something *new and risky* together. In this case, we should also observe effects for both the ego and the friend compared to the solo-intervention

Although we include questions in our questionnaires to get at these mechanisms and explore possible explanations for the differences between the BAF and Solo Voucher groups, our design will not be able to disentangle these different mechanisms.

In addition, there are three secondary effects we hope to estimate:

1. **Peer influence.** Conditional on one's position in the social network (centrality, number of friends, etc.), how does one's proximity to women in each treatment arm influence one's outcomes? We model the effect on a woman *i* in group *g* as

$$Y_{ig} = \alpha_g + \sum_d (\beta_d solo_{id} + \gamma_d bring_{id} + \delta_d total_{id}) + X_{ig} + \epsilon_{ig} \qquad (1)$$

   where $solo_{id}$ represents the number of women in the solo-voucher group *d* steps away in the social network of woman *i* and $bring_{id}$ represents the number of women in the bring-a-friend group d steps away in the social network of woman *i*. In addition to the vector X_{ig}that includes the baseline level of the outcome variable, we control for the total number of women at distance *d*, $total_{id}$ from woman *i*. We expect that the more directly connected peers have been treated, the more likely it is that a woman's attitudes/use of family planning will change. Furthermore, this effect may diffuse to peers two degrees (friend-of-a-friend) or even three degrees out in the social network. The goal of this estimation is to see whether a voucher intervention can trigger a village-wide attitudinal change via peer effects and whether the BAF voucher is more effective at doing so.

2. **Opinion leaders**. Do certain women have a bigger impact on the social network than others? Within the two voucher groups, we will determine whether women with greater network centrality, more friends, or different demographic characteristics end up with more peers and second-degree peers seeking out family planning. The goal of this estimation is to help future intervention efforts know which women to target in order to trigger a village-wide attitudinal change.

3. **Voucher impact.** What is the impact of receiving a voucher? To estimate this effect, we will compare the change in outcomes for the two voucher groups to the no-voucher group. Since everyone in the no-voucher group is potentially exposed to (presumably positive) spillover and recruitment effects, the estimand provides a lower bound for the impact of a voucher.