BACKGROUND

It is now recognized that effective implementation of integrated health, family planning, and poverty alleviation services for poor women is likely to have mutually reinforcing effects on health improvement, fertility reduction, and socioeconomic development (Amin et al., 2001; Bloom et al, 2001). With the availability of a number of highly effective and relatively inexpensive technologies, such as oral rehydration therapy (ORT), modern contraceptive methods, immunizations, vitamin supplementation, and prenatal care, substantial improvements in health can now be achieved at relatively low cost. However, the most effective way of delivering health and family planning services to the poor and the best way to motivate them to use these services are still subjects requiring systematic investigation. Inaccessibility of services is not the only barrier to the improvement of health and family planning. Demand-side factors also play a strong role, and one such factor is women's status or women's empowerment (e.g. Strauss et al. 2000). In the present study, we conduct an experiment to assess the impact of women's participation in microcredit on their empowerment.

Microcredit-based income-earning opportunities, begun by Professor Yunus in Bangladesh, have emerged as a major instrument for women's participation in the public sphere as well as a potential means for their empowerment (Amin and St. Pierre, 2002; Khandker, 1998). A micro-credit program is a kind of mobile bank, where bank workers go to their clients in remote areas to give them loans without collateral. Petty cash credits in the form of revolving group loans are given to the poor with less than 0.5 acre of land, 94 percent of whom are women (Khandker, 1998). Credits are given to individual women not belonging to the same family and they must form a five-member loan group in order to become eligible for credits. The group of borrowers becomes responsible for the repayment of each other's loans, replacing traditional financial collateral with social collateral. Group members are also required to attend bi-weekly or weekly meetings, where loan transactions are carried out together with imparting of functional education, skill training, and training for successful loan utilization and small-scale business enterprises. The microcredit is used by women to start or expand individual small scale animal husbandry, crop raising, and other productive activities in and around their homes. The program enables a woman not only to obtain badly needed improvement in the living standards, but also, and possibly more importantly, to bring about a change in customary norms: to substitute outside work for some time spent on household work. Microcredit programs are expanding rapidly in other developing countries; they are seen as the best method for reaching the poorest members of society, especially women, who do not usually have access to formal financial institutions.

Microcredit programs are advantageous in that they are self-sustainable with interest income, and in the role they play in quick economic assistance to the poor (Hulme and Mosley, 1996). The material

basis of a credit-based income-generating project, which provides women with an independent source of income, freedom of movement within and beyond a village, and high levels of interaction with other persons outside their families, can potentially empower them and make them more autonomous and independent, with demographic and health behavioral implications (Steele et al., 2001; Axinn, 1992).

Studies on the impact of micro-credit programs in Bangladesh have focused on its effects on reducing poverty and improving socioeconomic conditions of rural poor (Maloney and Ahmed, 1988; Khandker, 1998). Relatively little work has been done to examine the impact of these programs on fertility and health behavior. Of the few studies investigating a demographic and health impact, many have been beset with shortcomings (Schuler and Hashemi, 1994; Steele et al., 2001). One of these is selection bias. For example, women favorably disposed to contraceptive use are also more likely to join a micro-credit program, thus establishing a spurious relationship between contraceptive use and micro-credit membership. An exception is the study by Pitt et al. (1999), which explicitly adjusted for the self-selection into these programs as well as endogenous placement of micro-credit programs across the villages of Bangladesh. After adjusting for these two factors, they found no effect of micro-credit on contraceptive use, but found a positive effect on fertility. These findings were contrary to those of other studies that either found a positive relationship between micro-credit and contraceptive use or a negative relationship between micro-credit and fertility (Amin et al., 1995; Schuler and Hashemi, 1994; Steele et al. 2001).

Selection bias can also operate at the level of a village if allocation of programs occurs in a nonrandom manner, e.g. programs are located in villages that are closer to accessible roads or that have more modern attitudes and beliefs. Schuler and Hashemi (1994) found that members' participation in credit programs led to more contraceptive use among the non-program members in credit- villages compared to non-members in non-program-villages. From this, they concluded that the effects on contraceptive use apparently spread from members to nonmembers in the same communities. But this "effect" of the credit program on non-members may also be an indication that the program placement was not random, and credit programs were placed in villages where attitudes, to begin with, were more favorable toward contraceptive use.

SIGNIFICANCE

To our knowledge, this randomized micro-credit and health and family planning experiment in a "natural setting" is the only experiment to date that examines the relative impact of three program strategies targeted at poor women—differentially combining access to collateral-free micro-credit to finance self-employment with health and family planning services—on a variety of health and family

planning outcomes as well as on women's empowerment. The policy implications of the study findings both for improving coverage and effectiveness of health and family planning services as well as enhancing empowerment of the women are considerable. Although, many have written about linkages between micro-credit, women's empowerment and health and family planning behavior, little is known about their separate and interactive effects on health and family planning outcomes. The study results will show whether micro-credit, integrated with health and family planning services, can simultaneously bring about rapid poverty reduction, increases in family planning, health improvement and women's empowerment.

METHODS

In conjunction with Grameen Bank, we implemented a 4-celled randomized community intervention trial in three Divisions of Bangladesh. Specifically, we selected 16 rural areas from among 23 such areas where Grameen Bank had health centres in 2006. The sixteen selected areas were those with the lowest levels of microcredit participation in the Thana, the administrative area within which they are located (Palli Karma-Sahayak Foundation, 2004). Eight villages beyond the catchment area of each health centre (defined by a circle of approximately 4 kilometer radius) were sampled purposively from 24 villages enumerated; the eight with the lowest microcredit participation rates were selected. A team of interviewers then conducted a census of households in each selected village. The census questionnaire asked the number of household members, the occupation of the household head and monthly salary if he/she had salaried work, as well as the amount of land owned and value of household assets.

A baseline survey was then conducted by an outside survey organization in the 128 villages (8 villages for each of 16 health centres) between July and September 2006. Using the census data, a stratified random sample of households was chosen; four households that did not meet the Grameen Bank eligibility criteria for microcredit, as they owned more than 0.5 acres of land, twelve households with members currently enrolled in microcredit, and fifteen households with women eligible for microcredit but not currently enrolled. A household questionnaire was administered and ever-married women fifteen years of age and above were identified. The woman's questionnaire had the following sections: Respondent's background; Reproduction; Contraception; Pregnancy, Postnatal care and breastfeeding; Immunization and health; Fertility preferences; Husband's background and women's work; Decision-making and mobility; Women's participation in microcredit programs; and Treatment of women in the household.

After the baseline survey, villages around each Health Center were randomized to the 4 study cells (2 in each cell) and the interventions were begun. In the experimental areas, two types of services were offered in different combinations. The two services were enhanced micro-credit and a health services package (Table 1). The enhanced micro-credit intervention consisted of special emphases by Grameen Bank personnel to provide loans to poor women in the experimental villages. The Health services intervention included two components. First, a female village worker went door-to-door and provided basic medicines (including ORT), prenatal and postnatal counseling. Second, a satellite clinic with a physician (or occasionally a para-medic) was held in the experimental villages twice-a-month.

Table 1: Allocation of villages in randomized experimental design of enhanced microcredit and health services in rural Bangladesh

Health Services Intervention	Enhanced Microcredit Intervention	
	Yes	No
Yes	32 villages	32 villages
No	32 villages	32 villages

After 3 years, the interventions ended in 8/2009. Then a follow-up survey by an the same outside survey organization was begun in the same 128 villages. After consultation with statistical experts it became clear that to maximize the power to detect changes, it would be best to interview as many households who were in the baseline survey as possible. Preliminary results from the followup survey indicate that over 90% of the households from 2006 are still resident in the villages and tracking procedures will be used to locate some proportion of those who have migrated.

The main outcome measures of interest are measures of women's empowerment (role in household decision-making, mobility, access to resources), use of preventive and curative health care (e.g. use of trained birth attendants; use of ORS for childhood diarrhea) and contraceptive use. For these analyses appropriate sample weights will be derived using the census data and response rates.

[NOTE: Data will be available in 12/2009 and results will be available for presentation at the PAA Meetings.]