

## **Natural disaster and sickness shocks: evidence of informal insurance**

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Bangladesh, one of the world's poorest countries, is prone to large-scale natural disasters with consequent impact on human health and survival because of its geographical location and topographical features. Poverty, demographic pressure and rapid urbanization are forcing a vast majority of people to migrate to high risk areas (e.g. flood plains and islands). The vulnerability is further exacerbated by the increasing threat of a rising sea level. In 1998, Bangladesh experienced the "flood of the century" and households exposed to this flood had major crop failure, suffered from various water-borne diseases, lost shelter, assets and ability to meet their basic needs. Based on multiple rounds of household survey data from rural Bangladesh collected after the 1998 flooding, this paper investigates the factors that contribute to reducing sickness shocks after a massive natural disaster. Of particular interest, we take advantage of the well-known joint liability scheme of microfinance programs offered by non-governmental organizations (NGOs) to investigate if such a scheme reduces sickness shocks after a major natural disaster. The microfinance program initiated by the Grameen Bank in Bangladesh is considered a major innovation in the credit delivery system. In offering credit to the poor, it has largely replaced the traditional system of physical collateral requirement with group responsibility (the group members are mutual granters of each other). The successful model of group-based credit delivery system encouraged many NGOs to introduce similar programs. The role of group-based microfinance program in coping with natural disasters is yet to be explored. There are some preliminary discussions on exploring the pathways through which microfinance may affect the recovery from natural disasters, but it still lacks empirical investigations.

The degree of post-disaster recovery is significantly affected by the incidence of sickness. On the other hand, borrowers under a group-based microfinance program have incentive to provide mutual insurance by exchanging health-related information (e.g., use of oral re-hydration therapy, avoiding contaminated water, taking vaccination immediately), preventive medicine (e.g. water purification pills), loans to cover instant medical expenses, networks of personalized contacts with health workers and doctors, as well as by providing nursing and sharing the workload for those who fall ill. Motivated by some earlier theoretical studies, we

empirically investigate if there is any evidence of mutual insurance due to joint liability scheme of microfinance programs in the face of a massive natural disaster shock. We use a panel data set compiled from household surveys conducted by the International Food Policy Research Institute (IFPRI). The data was collected from 757 households in rural areas in Bangladesh at three points in time over a period of a year following the 1998 flood. Households were selected through a stratified random sampling, and survey responses included households' income, consumption expenditure, number of sick days, medical expenditure, assets, credit availability, and household level flood exposure. Empirical analysis indicates that microfinance programs may provide an informal mutual insurance mechanism to reduce sickness shocks. This result holds after addressing the potential selectivity bias due to nonrandom placement of microfinance programs. Simply put, panel data analysis reveals that households participated in microfinance programs suffer less from sickness. Thus, group-based microfinance program has the ability (though may be partially) to provide peer monitoring and mutual insurance in times of sickness after a major natural disaster.