

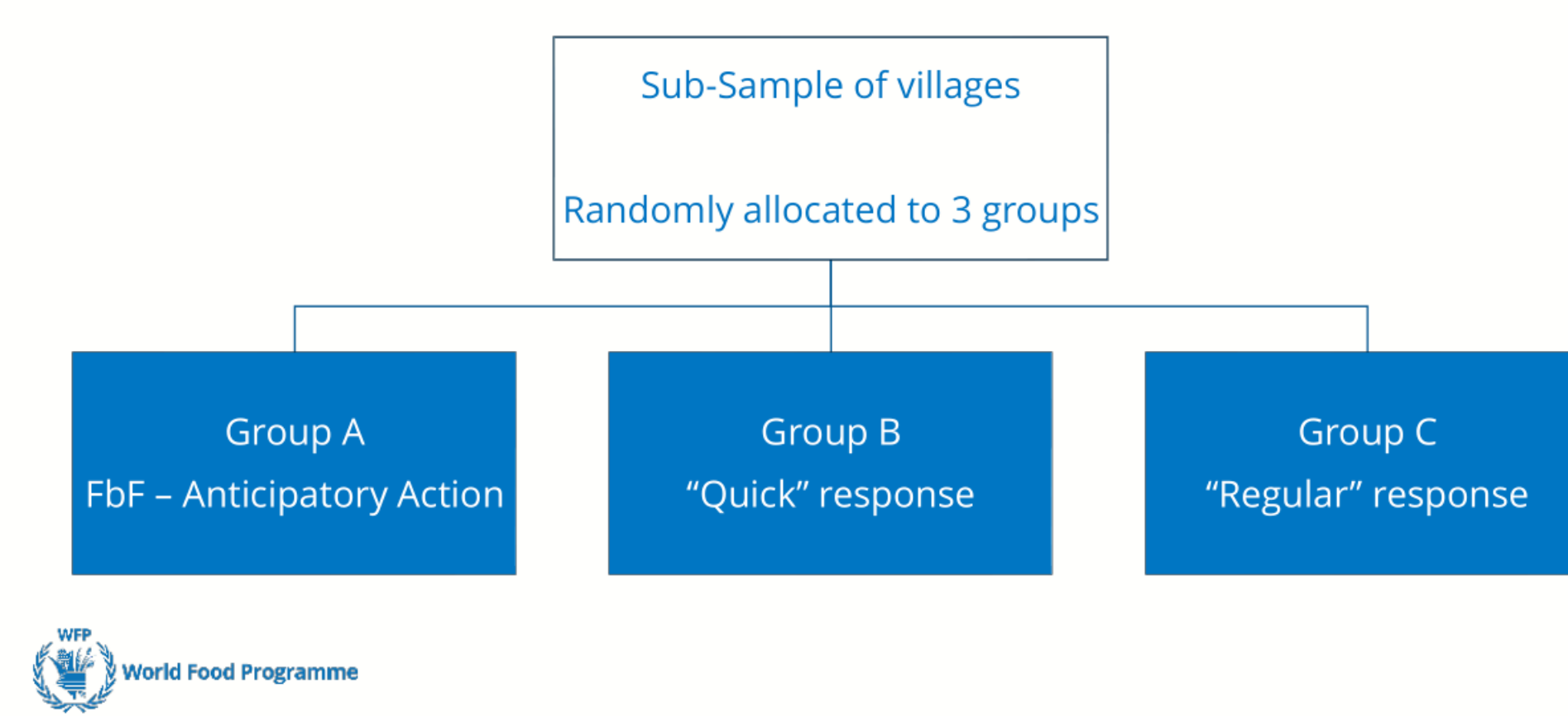
Forecast Based Financing Nepal: Initial Findings

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OBJETIVE

The objective of this study is to rigorously identify whether forecast-based financing (FbF) can improve outcomes for vulnerable populations relative to traditional humanitarian relief. To achieve this, we study the impact of an FbF program implemented by the World Food Programme in Nepal. WFP first identifies flood-prone areas and tags vulnerable households residing in these areas ahead of time. As soon as the weather forecast predicts a high probability of a flood in a particular flood-prone area ("the trigger"), the WFP provides transfers to any vulnerable households living in that area. This contrasts with their traditional assistance approach whereby the WFP physically travels to flood affected localities after a flood has occurred, to identify and confirm which households were impacted by floods and provide transfers accordingly, but this assistance is given approximately one month after floods occur.

Variation in Timing: Example Pilot AA IE Design



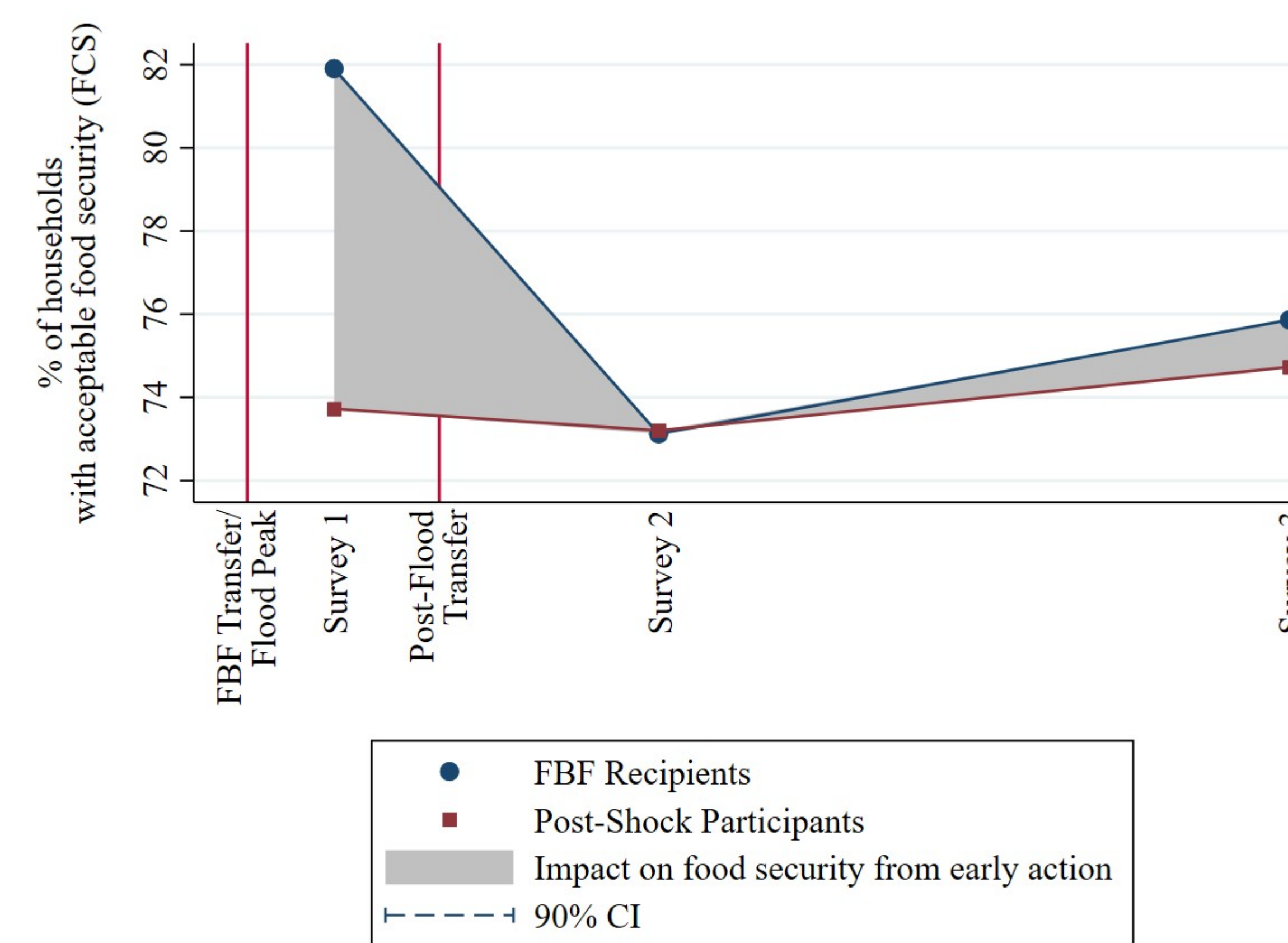
Identification Strategy

To evaluate the impact of FbF compared to traditional flood response, a subset of eligible households was randomly divided into two groups. The first group, referred to as the 'FbF group', received the transfers 3 days after the predicted flood peak. The second group, known as the 'post-flood group', received transfers three weeks after the actual flood peak. There was no pure control group. We compare outcomes for the FbF group to the post-flood group to document the impact of receiving transfers earlier based on weather forecasts. The transfers to both groups were valued at NPR 15,000 (118\$ USD), and they were issued once via remittance agents. Over 98% of the households reported receiving the transfers indicating that the intervention was well implemented.



Source: 3 rounds of household survey in Nepal October 2022 – June 2023

We collected three rounds of data for this study using SurveyCTO software and in-person interviews. Round 1 of data collection was conducted between November 4 and November 13, approximately 4 weeks after the transfers to the early group. Round 2 of data collection was conducted between January 10 and January 27, approximately 6 weeks after transfers to the post-flood group. The final third round of data collection took place between May 29 and June 14 to capture the harvest from winter and spring season of 2023.



RESULTS

We find that the Food Consumption Score (FCS) is 2.78 points (5%) higher in the FbF group compared to the post-flood group. Using standard thresholds of food security, we find that the FbF transfers decreased the share of households with "poor" food security (FCS<21) by 2 percentage points compared to 2% prevalence in the delayed transfer group, decreases the share of households with "borderline" security (21<FCS<35) by 6 percentage points compared to 23% prevalence in the delayed group, and increases the share of households achieving "acceptable" food security by 8 percentage points compared to 74% prevalence in the post-flood group.

Table 3: Food security

| | (1) FCS raw | (2) FCS poor | (3) FCS borderline | (4) FCS acceptable |
|---------------------|------------------|--------------------|-----------------------|-----------------------|
| Treatment x Round 1 | 2.78** (1.12) | -0.02*** (0.01) | -0.06*** (0.02) | 0.08*** (0.02) |
| Treatment x Round 2 | 0.48 (1.33) | 0.00 (0.00) | -0.02 (0.03) | 0.02 (0.03) |
| Treatment x Round 3 | 0.45 (1.11) | 0.00 (0.00) | -0.02 (0.02) | 0.02 (0.03) |
| Delayed group mean | 48.32 | 0.02 | 0.23 | 0.74 |
| Controls | Yes | Yes | Yes | Yes |
| Observations | 5949 | 5949 | 5949 | 5949 |

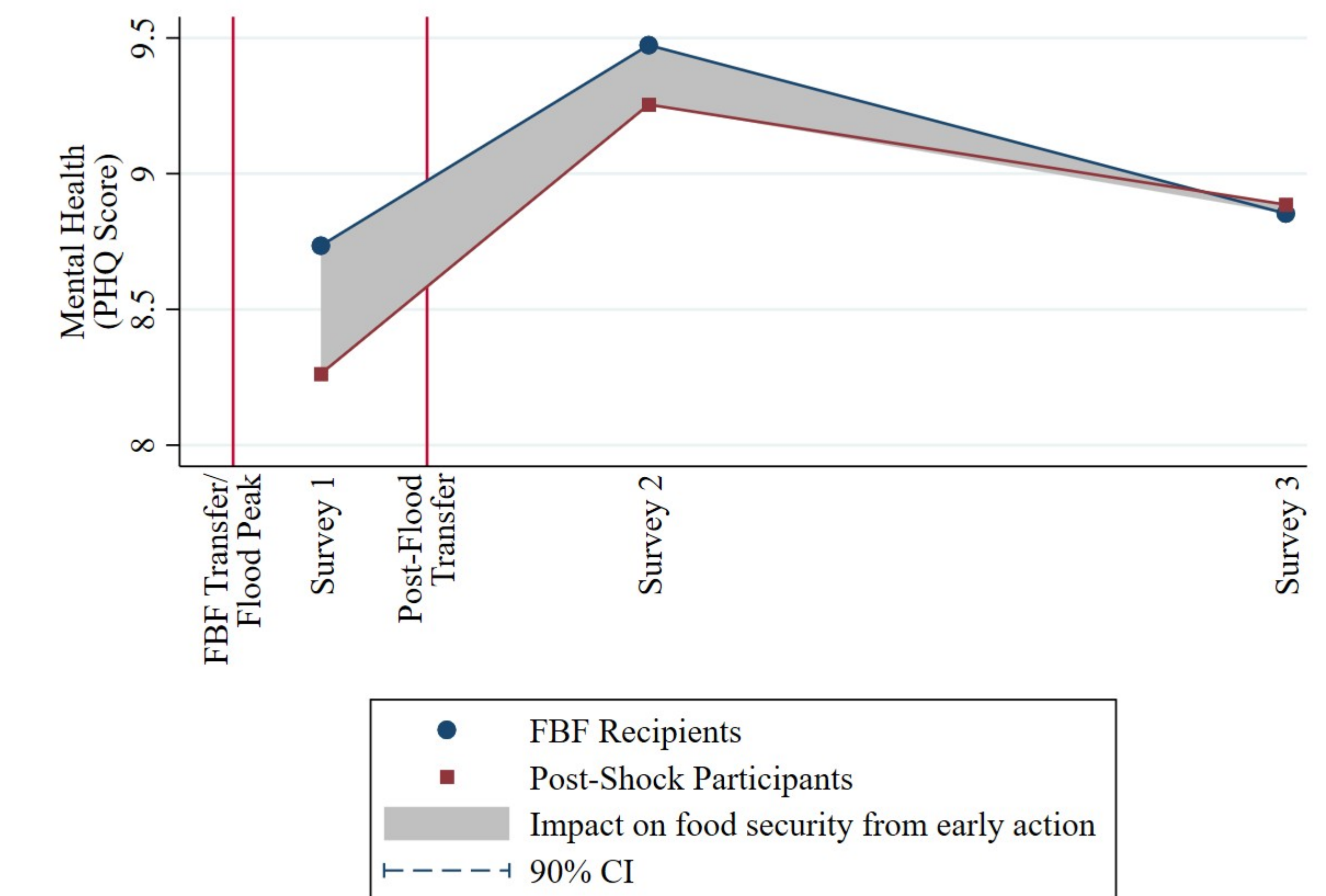
Note: * p < 0.10, ** p < 0.05, *** p < 0.01.
 Delayed group mean calculated in round 1 or earliest available round.
 83 villages were paid before Round 1, other 83 were paid before Round 2.
 Included the following covariates: Has skilled job, Has mental disability, Has physical disability, House brick wall, Woman has citizen card, Has pregnant woman, Low caste household.

Table 4: Mental health

| | (1) PHQ4 score std. | (2) Respondent is anxious | (3) Respondent is depressed | (4) Cantril's ladder |
|---------------------|------------------------|------------------------------|--------------------------------|-------------------------|
| Treatment x Round 1 | 0.13* (0.07) | -0.09*** (0.03) | -0.07** (0.03) | 0.28* (0.16) |
| Treatment x Round 2 | 0.09* (0.05) | -0.04 (0.03) | -0.04 (0.03) | 0.17 (0.19) |
| Treatment x Round 3 | 0.02 (0.06) | -0.01 (0.03) | -0.02 (0.03) | 0.03 (0.11) |
| Delayed group mean | -0.19 | 0.70 | 0.63 | 4.04 |
| Controls | Yes | Yes | Yes | Yes |
| Observations | 5949 | 5949 | 5949 | 5949 |

Note: * p < 0.10, ** p < 0.05, *** p < 0.01.
 Delayed group mean calculated in round 1 or earliest available round.
 83 villages were paid before Round 1, other 83 were paid before Round 2.
 Included the following covariates: Has skilled job, Has mental disability, Has physical disability, House brick wall, Woman has citizen card, Has pregnant woman, Low caste household.
 Higher PHQ4 scores mean better mental health
 PHQ4 scores standardized using pooled mean and standard deviation.

In addition to helping households maintain food consumption, we are interested in whether the FbF transfers help recipients avoid adverse experiences as expressed by depression and anxiety. In column 1 of Table 4, we find that FbF transfers increased the PHQ4 score by .13 SD indicating an improvement in overall mental health. Using binary measures in columns 2 and 3, we find that FbF reduced indications of recipients' anxiety by 9 percentage points compared to a 70% prevalence rate in the delayed group and depression by 7 percentage points respectively compared to a prevalence rate of 63% in the delayed group. Subjective well-being as measured by the Cantril ladder question is also higher in the FbF group compared to the post-flood group by 0.25 points from a base of 4.04.



NEXT STEPS

We are waiting for exogenous estimates of flooding extend in 2022 by using satellite data. Once we obtain that data we can test whether early transfers have differential impact contingent on severity of flooding risk of the household.

This study also lacked the "traditional method" of delivering flood response, thus we are unable to do cost/benefit estimates of providing early transfers to potentially not flood affected people versus the gains from delivering transfers early to the flood affected population.

This is part of a multi-year research partnership between DIME and WFP's Office of Evaluation. This research design will be replicated in Bangladesh, Philippines and South America.